Thinking Through the Cold War:
RAND, National Security and Domestic Policy, 1945-1975

David R. Jardini, Ph.D.
Meadow Lands, PA
September 2013

Published by David Jardini at Smashwords

Copyright 2013 David Jardini

This ebook is licensed for your personal enjoyment only. This ebook may not be re-sold or given away to other people. If you would like to share this book with another person, please purchase an additional copy for each recipient. If you're reading this book and did not purchase it, or it was not purchased for your use only, then please return to Smashwords.com and purchase your own copy. Thank you for respecting the hard work of this author

Table of Contents

Acknowledgements
Brief Chronology of Relevant Events, 1946-1975
Chapter 1. Introduction
The RAND Corporation; RAND's Importance as a Historical Subject
Part 1: RAND's Formation and First Decade
Chapter 2. Early RAND and the Emergence of Systems Analysis
The Genesis of Project RAND; Project RAND Gets Underway, 1946-47; Project RAND's Early Objectives; The Origins of Systems Analysis
Chapter 3. The Golden Years of RAND Research, 1946-1960
Project RAND as a Research Organization, 1946-1948; The Creation of the RAND Corporation, 1948; Pioneering RAND Research and Researchers; Hard Science and Engineering; Space Research; Aircraft; Nuclear Physics; Electronics; From Military Worth to Mathematics, Economics, and Social Sciences; Computing; Applied Mathematics; Game Theory; Economics; Soviet Studies; Human Behavior; Artificial Intelligence
Part 2: RAND Reshapes Government Policy Making, 1958-1966
Chapter 4. The Trouble with Independence
Independence at RAND; The Air Force in Relative Decline; The Air Force Moves to Control RAND; The Reaction at RAND: The Scientific Strategists' "End Run"; The Scientific Strategists Join McNamara's Band
Chapter 5. RAND and the McNamara Revolution
The McNamara Revolution; Planning-Programming-Budgeting in the Department of Defense; Air Force Resistance to the McNamara Revolution
Chapter 6. From the Pentagon to the Great Society
The Great Society and the Cold War; Origins of the War on Poverty; The Civilianization of PPB and the Centralization of Social Policy-Making
Part 3: RAND Diversifies into Social Welfare Research, 1960-1966
Chapter 7. RAND at the Rubicon
The Showdown over ISA; The Attack on the Nonprofits; The Zuckert Directive; RAND Considers Its Options; The Air Force Raises the Stakes; RAND at its Rubicon
Chapter 8. The Wrong War: RAND in Vietnam, 1954-1969
The Kennedy Administration's Focus on Limited Warfare; RAND's Early Limited War and Counterinsurgency Research; RAND and Counterinsurgency, 1961-64; RAND's Vietnam Research Program, 1964-69; Vietnam Alternatives Study; Conclusion
Chapter 9. Vietnam's Impact on RAND, 1962-1966
Through a Cold War Lens: The Vietnam Orthodoxy; The Viet Cong Motivation and Morale Studies, 1964-1969
Chapter 10. RAND Decides to Diversify, 1965-1966
Recomposition of RAND's Board of Trustees, 1961-1965; Social Welfare as a New Direction; Congressional Pressure and the Further Deterioration of Air Force Relations; RAND's Search for a New Direction, 1965-66
Part 4: RAND's Early Social Welfare Research, 1967-1976
Chapter 11. RAND Diversifies into Social Welfare Research
Project RAND Contract Stalemate, Summer 1966; Rowen Takes Charge at RAND; Pursuit of Social Welfare Funding Opportunities; RAND's Diversification Plan,; RAND's Initial Social Research Opportunities; Restructuring RAND for Diversification; Rowen's Urban Institute

Proposals; Creation of the Urban Institute, 1967-68; RAND's Diversification after the Urban Institute; Conclusion
Chapter 12. RAND's Adventure in New York City, 1967-1976
Lindsay Administration and New York City Background; Lindsay's Efforts to Create a "RAND" for New York City; The New York City-RAND Partnership in its First Year, 1968; Creation of the New York City-RAND Institute, 1969; NYCRI's Program of Research; Fire Department; Police Department; Housing Research; Health Services Research; Welfare Research; The Outcomes of RAND's Early Research Program in New York City; RAND's Entanglement in Lindsay's Political Web; The New York City-RAND Institute's Fight for Survival; Wolves at the Door: Abraham Beame is Elected Mayor of New York, 1973; The Institute's Death in Slow Motion; Conclusion
Chapter 13. The Search for Stability, 1968-72
Daniel Ellsberg, Cold Warrior; RAND's Early Social Welfare Research Strategy; RAND's Social Welfare Research Program; California Programs; Health Care and Biosciences; Communications and Public Policy; Education and Human Resources; The Challenges of Organizational Change; The Growing Crisis at RAND; Et tu Daniel: The Pentagon Papers and the End of the Rowen Era; The Search for Stability
Endnotes

Acknowledgments

As I sit in a makeshift office in the detached garage of our new farm-home, I can pause to reflect on the long road that I have travelled with this book. Thinking Through the Cold War began as a summer research project in 1994, more than fifteen years ago. Since those days of my relative youth, this book has taken me to many intriguing places and I, in turn, have taken it with me on a wondrous life journey. Joyful marriage, babies and (all too soon) children, seemingly endless travels, and remarkable friendships have filled these years, all with my book tagging along – waiting patiently for a few moments of attention. Writing what ultimately became a few of the core chapters of this book in my parent's attic back in 1994, I could not have imagined how I would move the project towards its conclusion. Glancing to my right between typed sentences, I can watch our three little girls (in matching pink dresses) happily playing together and exploring their new home. The green fields and pastures that spread before them sway with a warm summer breeze and remind me that I've got mowing to do.

No project of this magnitude can be executed without the generous support of many individuals and organizations, and this researcher has incurred innumerable debts. First, the present book received financial support from a wide range of institutions. The National Science Foundation provided the largest single source of support through both a research and writing grant (#SBER97-10563) and a Dissertation Improvement Grant (#SBER95-20187) from the Studies in Science, Technology, and Society Program. I would like to express my special gratitude to former STS program director Ronald Overman, whose concern and support for high-caliber scholarship has improved fundamentally the study of science, technology, and society in the United States. This book has further benefited from the financial support of the Air Force Historical Research Agency, Lyndon Baines Johnson Foundation, the John F. Kennedy Foundation, and the John E. Rovensky Fellowship in Business and Economic History.

The staff members of the National Archives in Washington, D.C., and San Bruno, CA, the Johnson and Kennedy presidential libraries, as well as the staff of the Air Force Historical Research Agency all gave graciously of their time and knowledge. In particular, Joseph Caver, Archangelo Difante, and Brenda Pietrowski at the Air Force Historical Research Agency, Linda Hanson and Christina Houston at the Johnson Library, and William Johnson, June Payne, and Maura Porter at the Kennedy Library provided invaluable assistance.

The contributions of many individuals at the RAND Corporation also considerably improved this book. Walter Nelson, Richard Bancroft, Leroy Reyes, and Joan Schlimgen of RAND's library staff offered expert assistance and research support. Others at RAND whose assistance is deeply appreciated include Vivian Arterbery, Jo Chamorro, Mike McQueen, Edie Nichols, Malcolm Palmatier, Daniel Pappas, and Michael Rich. Special acknowledgment must be made of Gustave H. Shubert's contribution to this project. Mr. Shubert's dedication to intellectual freedom, scholarly rigor, and historical accuracy, his incisive advice and criticism, and his energetic advocacy of the RAND History Project were inspirations to me and added immeasurably to the quality of the final product.

Furthermore, this book would not have been possible without the freedom and support provided by Carnegie Mellon University's Department of History. The faculty and students at Carnegie Mellon have created an exceptional environment of collegiality in which it has been my unqualified pleasure to participate. In particular, the CMU's Cold War Science and Technology Studies Program, under the direction of David A. Hounshell, offered a stimulating environment, and its members generously provided crucial feedback as my writing proceeded. At the risk of neglecting others, I would like to express my enduring gratitude to Glen Asner, Jennifer Bannister Alexander, Richard Douglas David, Gerard J. Fitzgerald, Sharon Ghamari-Tabrizi, Hugh Gorman,

Daniel Holbrook, Anthony A. McIntire, Asif A. Saddiqi, and M. Joshua Silverman. Also, my special thanks go to Gail Dickey, the History Department's business manager, for her endless problem-solving and cheerful support. I have incurred far too many debts among CMU's faculty to itemize them here, but Drs. Edward Constant, Wendy Goldman, John Modell, Steven Schlossman, Joel Tarr, and Joe William Trotter deserve special thanks. Susan Collins also contributed generously of her time and expertise as research librarian at Carnegie Mellon's Hunt Memorial Library. Michael S. Neiberg, a fellow graduate student at CMU and now Professor of History in the Department of National Security and Strategy at the United States Army War College selflessly and patiently read my draft chapters. His comments and suggestions dramatically improved my manuscript. Finally, I can only begin to acknowledge my debt to my advisor and friend, Dr. David A. Hounshell. Dr. Hounshell consistently has provided expert advice, acute criticism, and unwavering support to this researcher. Although colleagues and readers have contributed greatly to the accuracy and quality of this work, any remaining errors are the sole responsibility of the author.

Finally, my deepest gratitude is reserved for the many friends and family who provided unfailing support throughout the long process that resulted in this book. In particular, my son, Patrick David Jardini, patiently endured years in which his father's attention often was fastened to distant and unfathomable subjects. Although he won't admit it, Patrick truly is the world's best boy. My sister, Nancy, endured innumerable discussions regarding this book, and my sister, Michele, and brother-in-law, Sean C. Gannon, provided a comfortable and friendly home-away-from-home during my research trips to Southern California. Although my wife, Dawn L. Shober Jardini, was not with me at the start of this project, her love and encouragement sustained me as it approached its end. Finally, I regret that I will never be able to adequately express my admiration for my parents, Orlando and Linda Jardini, or repay their selfless generosity. Through my many trials and missteps, their love and devotion have been constants, sustaining both my strength and confidence. This book is dedicated to them.

Back to Table of Contents

Brief Chronology of Relevant Events, 1946-1975

1946 Project RAND created as a joint venture by the Air Force and Douglas Aircraft Co.
1948 The RAND Corporation formed as an independent nonprofit research corporation. Air Force Project RAND contract is sole source of funding for corporation.
1949 Soviet Union detonates its first atomic bomb.
1949 RAND presents initial warfare systems analyses to the Air Force.
1950 The Ford Foundation provides RAND with $1 million working capital grant.
1952 United States detonates first thermonuclear hydrogen bomb.
1957 Soviet Union places the first artificial satellite, Sputnik I, into earth orbit.
1958 RAND performs massive Strategic Offensive Forces study for Air Force. This study is a watershed in the deterioration of RAND-Air Force relations.
1960 John F. Kennedy elected president.
1961 Secretary of Defense-designate Robert S. McNamara appoints RAND alumni to key positions. RAND relationship with Office of the Secretary of Defense expands rapidly.
1964 President Lyndon Johnson decides that "Great Society" programs will be the core of his 1965 legislative program.
1965 RAND board of trustees decides to adopt diversification into social welfare research. RAND president Frank Collbohm asked to resign.
1966 RAND presidency offered to and accepted by Henry S. Rowen.
1967 RAND and New York City enter partnership for research on urban management.
1968 47-volume Vietnam history completed by Office of the Secretary of Defense task force
1969 New York City-RAND Institute incorporated.
1971 Top Secret Vietnam history—known as the Pentagon Papers—published by the New York Times
1972 Donald Rice succeeds Henry Rowen as RAND's president
1975 New York City-RAND Institute closed

Back to Table of Contents

Chapter One
Introduction

Shortly after the Soviet Union detonated its first atomic weapon in 1949, the Assistant Director of the RAND Corporation, L. J. Henderson, wrote to Frank Collbohm, the corporation's Director,

> *Actions which our government may be forced to take in view of the world situation . . . may involve the necessity of some deception by us of our own population. This is of course a very touchy subject, but intuitively it seems a very important one and the inventive aspects of how to go about this are rather fascinating."*[1]

RAND was then only three years old, but the World War II alliance between the United States and the Soviet Union had already dissolved, plunging the world into the grim, four-decade long Cold War. During this long "twilight war" the defense establishments on both sides grew enormously and created new institutions for the production and manipulation of knowledge. In the United States, national security concerns pervaded the country's policy agenda and fundamentally altered the course and nature of American democracy. At the core of this emergent national defense complex was massive government support for scientific and technological research. While much of this research was performed on university campuses and in industrial research and development centers, new institutions such as the national weapons laboratories and military "think tanks" attracted an unprecedented proportion of the nation's intellectual resources. These richly supported entities blazed scientific and technological paths guided by the logic of a Cold War calculus. Few prosecuted their missions as effectively as the RAND Corporation.

Thinking Through the Cold War uses the RAND Corporation as a window on the complex interaction among national security and social welfare research and policy-making in Cold War America. It argues that the Cold War had deep effects not only on the locus of research and development but also on the process of knowledge production in the United States. The emergence and proliferation of entirely new classes of research institutions during the Cold War altered the structural landscape of American science as well as American democracy. The work done in RAND's offices, conference rooms and laboratories shaped everything from President Eisenhower's "Domino Theory" to President Johnson's Great Society; from the brinksmanship of the Cuban Missile Crisis to the more recent War on Drugs.

Public policy research organizations, of which RAND is the archetype, are now embedded in American public policy-making, and the tools forged at RAND for policy analysis and decision-making are now pervasive. RAND's success during the late 1940s and 1950s catalyzed a proliferation of "think tanks", a term coined during the 1950s to describe a new class of mainly defense-oriented, non-profit research institutions. Today, thousands of such policy research organizations, often richly funded by private and corporate sponsors with specific interests, dominate key political debates by lending their professed "expert" analysis to support sharply defined policy positions. It is virtually impossible to watch a newscast or to read a published article regarding a prominent policy issue that does not include input from one or more of the centers, institutes, or foundations that today blanket the American political landscape. Innocuously named organizations such as the Heritage Foundation and the Free Enterprise Institute on the conservative right and the Center for American Progress and the Tellus Institute on the liberal left lend their stentorian voices to all significant public discourses. In their

rationality, mathematical complexity, and professed objectivity, the tools employed by these "think tanks" embody the values and achievements of modern American social science. Yet, by reinforcing centralized, elitist policy-making, their widespread adoption in the federal government contribute to the alienation many Americans feel concerning the national government. Historians across the United States are just beginning to untangle the complex implications of the Cold War for American society, and understanding the RAND Corporation is a critical step in that direction.

The RAND Corporation

At the conclusion of World War II, many of America's civilian and military leaders recognized that, in a broad sense, research and development had been the decisive weapons of the war and promised to remain so in the future.[2] The wartime model of research was characterized by massive expenditures, unprecedented coordination among military, industrial, and academic interests, and conscious and aggressive government intervention.[3] This new model had led to remarkable achievements in areas such as radar and proximity fuses[4] and had gained universal notoriety with the success of the Manhattan Project—America's vast atomic weapons program.[5] At the same time, it was equally clear that scientists' reluctance to work directly under military control meant that the wartime organization of research could not be extended unchanged into the postwar environment.[6]

The RAND Corporation represented one solution to this dilemma and proved a model for Cold War research. RAND, which acquired its name from the acronym for Research ANd Development, was formed at the end of World War II by Air Force and industrial leaders who wanted to harness the nation's foremost intellectual talent to military research and planning. Formally, the Air Force created a broadly-defined and, nominally at least, independent research organization—designated "Project RAND"—and situated it within the Douglas Aircraft Company. While Project RAND would be administered and supervised by Douglas, the Air Force intended it to operate as a virtually autonomous organization. By 1948, however, this arrangement had become unpalatable for the Air Force and Douglas Aircraft, as well as for Project RAND personnel. As a result, RAND officials created in 1948 an independent nonprofit corporation, the RAND Corporation, to house Project RAND and the organization's other assets.[7]

Despite RAND's apparent independence from both the Air Force and the aircraft industry, the corporation was connected directly to the highest levels of the Air Force structure. Its intended role was to bridge the divide between the Air Force and the nation's research community so as to effect a maximal coordination of long-range research and development with the military air program. RAND served as a conduit through which the intellectual resources of American academia and industry could be channeled towards problems of national defense and connected with top-level planning functionaries in the military.

As an institutional innovation, RAND was an unqualified success. Its research staff produced key innovations in such diverse fields as computer science, economic theory, artificial intelligence, space technology, and the social sciences.[8] Often referred to as "Mother RAND" because of its role as progenitor of a new species of military-funded non-profit research organizations, RAND even drew regular attacks in the Soviet Union's official newspaper, Pravda, whose writers identified RAND's seemingly serene beachfront headquarters as an epicenter of American warmongering.[9] By the mid-1960s, the RAND Corporation comprised over 1,100 employees, consumed more than $23 million ($170 million 2009 USD) of research funding annually, and, under a cloak of secrecy, was as richly accomplished as any research institution in the United States.

Existing literature concerning RAND's history concentrates on the organization's role in nuclear weapons research and policy-making.[10] While RAND was certainly one of the foremost centers of such work at least until the early 1960s, the organization's intellectual production spanned both the natural and social sciences and deeply affected the development of several academic fields. For example, RAND researchers performed pioneering work in rocketry and space systems—largely setting the agenda for the early American space program.[11] RAND also provided a locus for crucial research in digital computing and artificial intelligence. But RAND's interests stretched well beyond hard science.

Of particular significance were RAND's achievements in social science theories of complex systems and tools for decision-making under conditions of uncertainty. The basis for these achievements lies in RAND's pioneering work in applied mathematics, largely performed during the late 1940s and 1950s. This work was intended to overcome the limitations of operations research—a body of techniques developed largely during World War II to estimate the optimal performance or configuration of existing systems. RAND mathematicians and mathematical economists made critical advances in game theory, linear and dynamic programming, mathematical modeling and simulation, network theory, cost analysis, and Monte Carlo methods as they sought to address military decision problems that previously could not be analyzed mathematically.[12] George B. Dantzig, for example, elaborated at RAND the simplex method of analysis, which allowed RAND researchers to employ electronic computers to solve previously unmanageable series of simultaneous linear equations.[13] Also during the 1950s, Richard Bellman and fellow RAND staff members codified a system of optimization techniques under the rubric of dynamic programming.[14] Bellman's work described a way of solving problems in which the analyst must select the best decisions one after another. His work and other research done at RAND in this regard form one of the foundations of modern computer programming. Finally, in game theory, RAND research teams frequently included consultants John von Neumann and Oskar Morgenstern—the two men credited with founding this field during the early 1940s—as these teams made crucial theoretical contributions while seeking to mathematize strategic decisions. While the work performed at RAND attacked problems such as nuclear war scenarios, radar search and prediction, and antisubmarine warfare, RAND's pathbreaking work permeates the social sciences, especially economics, and is widely used in such disparate activities as biology, engineering, opinion polling, marketing and advertising, and philosophy.[15]

The centerpiece of RAND's methodological innovations—to which all of the corporation's applied mathematical developments contributed—was systems analysis. Many of RAND's early researchers served during World War II on the Applied Mathematics Panel. They conceptualized systems analysis as a refinement of operations research and the basis for a "science of warfare." They envisioned it as a "rational," mathematically rigorous means of choosing among alternative future systems characterized by complex environments, large degrees of freedom, and considerable uncertainty.[16] Originally created to evaluate possible nuclear weapons deployment scenarios, RAND's systems analysis techniques are archetypal of modern social science, incorporating both quantitative methods, especially mathematical modeling, and qualitative analysis involving a diversity of disciplines. The objective of RAND's system analyses was to provide information to military decision-makers that would sharpen their judgment and provide the basis for more informed choices.

RAND's Importance as a Historical Subject

For the historian or policy student seeking to untangle the Cold War web of relationships connecting American civilian government, military, academic, and industrial interests, the RAND

Corporation provides a unique point of departure. RAND is a quintessential Cold War organization. Created to perpetuate the World War II military-academic-industrial alliance, RAND's policy analysis methods permeate the American political system; RAND's researchers have created or reshaped numerous fields of intellectual endeavor; and RAND alumni have held, and continue to hold, some of the most senior and influential positions in the American polity. Indeed, it is challenging to identify an important national policy issue during the past fifty years that RAND did not play a role in resolving. The space race, the U.S.-Soviet nuclear arms confrontation, the creation of the Great Society social welfare programs, the Vietnam War, the digital revolution, national health care—all bear the imprint of RAND's wide ranging research and influence.

For historians of research and development, analysis of RAND as a research institution illustrates the emergence of military-sponsored research organizations during the Cold War and their role in government policy formulation.[17] The RAND Corporation is the pioneering and probably the most successful "think tank" spawned by the Cold War. As James Allen Smith writes, "think tank" is, "a curious phrase suggesting both the rarefied isolation of those who think about policy, as well as their prominent public display, like some rare species of fish or reptile confined behind the glass of an aquarium or zoo."[18] In the post-World War II period, driven in large part because of the very success of the RAND Corporation, think tanks began to dominate the formulation of policy, initially in matters of national security and eventually in issues of social and economic policy. Smith wrote that, "RAND and think tank are virtually synonymous."[19] This is so, and understanding the extraordinary role played in modern society by the five thousand or so functioning policy research institutions begins with understanding RAND.

Furthermore, RAND is a dynamic and constantly evolving research organization that has undergone profound changes in response to the Cold War's shifting currents and its aftermath. Whereas RAND evokes the image of a highly stable and secure institution, RAND has, in fact, experienced almost continual change over its sixty-year history. Thinking Through the Cold War captures this complexity, in part, by describing RAND's growing estrangement from the Air Force during the years 1958 to 1966, the interlocking tale of RAND's deepening relationship with the Office of the Secretary of Defense (OSD), and the complex factors that drove the corporation's strategic diversification into social welfare research in 1966.

In conveying RAND's evolution as a research institution, this book connects fundamental changes in the external Cold War environment with changes in RAND's research program. In particular, two long-term changes inexorably linked RAND's national security research with the emerging U.S. social welfare programs of the late 1960s and early 1970s—a connection that was crystallized in the corporation's diversification into non-military social welfare research. The first of these long-term changes was the gradual migration of strategic policy concerns away from global nuclear warfare towards more complex and socially-contingent issues such as "third area" conflicts, counterinsurgency, limited warfare, and social revolution.[20] During the 1950s, the possibility of nuclear exchange posed the single greatest threat to national security, and the American defense establishment, including RAND's research program, was mobilized to meet this challenge.

By the 1960s, however, new demands created by unrest in Latin America and growing American involvement in Southeast Asia had shifted defense policy attention toward the social content of warfare and interservice strategic solutions.[21] These changes brought social analyses to the forefront of national defense policy research. In response, RAND research methods evolved so as to incorporate increasingly sophisticated social analyses, and by the mid-1960s the corporation was heavily involved in research that required extensive study of foreign social, political, and cultural structures.[22] As a result of these new demands, the social sciences became

the most rapidly growing and most highly visible components of RAND's organization, and research in social welfare issues, while still within a national security context, moved to the top of the agenda.

The second long-term change that linked RAND's national security research to emergent U.S. social welfare policies was the reorientation of national policy attention, and thus federal resource allocation toward domestic social ills. This transformation grew steadily in force throughout the 1960s and received its greatest impetus in 1965 when the Lyndon Johnson administration launched the war on poverty with its energetic implementation of the "Great Society" social welfare programs. Focusing on such problems as educational opportunities and urban decay, Johnson's agenda channeled enormous funding to federal agencies charged with social research and policy-making. Throughout the implementation of the Great Society, RAND alumni and RAND analytical methods pervaded the social welfare programs, thus providing an opportunity for RAND to redefine and re-deploy its resources by expanding beyond national security research into domestic social welfare analysis.[23] Thinking Through the Cold War explores RAND's motives for diversifying into non-defense fields, the retooling of RAND's military methodologies for civilian applications, the context and content of RAND's program of non-military research, and the interactions between RAND's ongoing defense research efforts and the incipient social research programs.

For historians of science and technology, study of RAND offers new insights to fundamental debates. Certainly, RAND was one of the most prolific research organizations of the Cold War, generating new knowledge across the spectrum of "hard" and "soft" sciences. In the physical sciences and engineering, RAND's researchers made key contributions to missile and space technologies, digital computing and communications systems—including contributing to the genesis of the now-pervasive internet—materials science, and atmospheric science. In the social sciences and, especially, in the fields of applied mathematics and analytical methodologies, RAND played a leading role in shaping the trajectory of post-World War II American scholarship and policymaking. Thinking Through the Cold War sheds new light on the implications of defense sponsorship for the definition and content of Cold War scientific and technological innovation by exploring the experiences and influences of the Cold War's most significant think tank.

In doing so, this book engages a key question in the historical study of science and technology during the Cold War: was American scientific and technological development distorted or complemented by massive government sponsorship? This subject has long attracted considerable scholarly attention, but in recent years an increasingly well-defined bifurcation of historical interpretation has emerged.[24] On one hand, some scholars argue that massive defense sponsorship of research during the Cold War skewed the very content and nature of scientific development in the United States toward military-defined research imperatives.[25] In his recent review of Stuart Leslie's The Cold War and American Science, Roger Geiger described this body of literature as a "distortionist" critique of Cold War science and technology.[26] In contrast to this distortionist interpretation, historians such as Geiger and Daniel Kevles argue that scientific development was not distorted but largely complemented by military research expenditures.[27] Thinking Through the Cold War argues that the production of knowledge at RAND was profoundly conditioned by the corporation's national security sponsorship and its intrinsic role in the military policy structure. For example, analysis of RAND's pioneering work in fields such as game theory and economics—research that underpins much of the current state of knowledge in these fields—illustrates the Cold War contextual influences on RAND's research output.

RAND's central role in both national security and social welfare policy-making provides a unique opportunity for students of policy history and analysis to trace the implementation and effectiveness of modern policy research methods across range of venues. Thinking Through the

Cold War demonstrates the close connections between national defense and social welfare research at RAND and illuminates the consequences for U.S. social programs of their national defense heritage. In particular, the book examines the creation and codification at RAND of analytical methodologies such as systems analysis and program budgeting, the diffusion of these techniques to the Department of Defense during the early 1960s, and their mandated dissemination throughout the federal policy-making structure with the institution of the Great Society social programs.

Thinking Through the Cold War also studies the implementation and effectiveness of RAND's analytical methods for social welfare policy-making. As mentioned above, President Lyndon Johnson mandated in 1965 the adoption of RAND's analytical methods across the federal bureaucratic structure. The present book examines how this decision altered the trajectory of the social welfare programs and the impact of defense-based social science methods on social welfare research programs and outcomes. Furthermore, the creation of the New York City-RAND Institute in 1968 provides an ideal opportunity to analyze the successes and difficulties RAND encountered as it attempted to convert its military methodologies to civilian purposes. The relationship between the municipal government of New York City and RAND began in January 1968, when Mayor John Lindsay and RAND President Henry Rowen signed four contracts for six-month studies of the New York Police Department, the Fire Department, the Housing and Development Administration, and the Health Services Administration. In 1969, the partnership between RAND and the Lindsay administration was formally institutionalized with the joint creation of the New York City-RAND Institute. This institute remained in operation for six years, and its staff members engaged in a broad range of research efforts, many of which are well-documented in RAND's archives and the New York City Municipal Archives. Chapter Ten provides a case study of RAND's experience in New York City and argues that despite the ultimate failure of this venture, the New York City-RAND Institute was pivotal redeploying RAND's intellectual efforts from national security to social policy issues.

Finally, because many of the most pressing policy issues facing the United States today have their roots in the Cold War, Thinking Through the Cold War is not of purely historical interest. As the United States moves into a new era it becomes increasingly important to understand the complex interaction between national security and social welfare policy-making in the Cold War. The diffusion of RAND's military-sponsored knowledge and techniques to the civilian and social welfare arenas represents an early example of the conversion of Cold War national defense resources to non-military uses. This book's analysis of the difficulties and successes associated with RAND's early attempt at defense conversion provides current policy-makers insights to the options facing the U.S. defense establishment today. Also, Thinking Through the Cold War enhances our understanding of broader Cold War social patterns and the ways in which American social, political, and intellectual life continues to be shaped by the vestiges of the Cold War

Back to Table of Contents

Part 1: RAND's Formation and First Decade

Chapter Two
Early RAND and the Emergence of Systems Analysis

During the war, outstanding scientists and technicians in all relevant fields were enlisted to assist in the solution of military problems. A major percentage of the outstanding research analysts have severed all connections with the military and have insisted upon return to their activities in educational institutions and research laboratories. It is planned to regain the use of the brains and ability of many of these same people in the solution of problems arising under this [Project RAND] contract.

Project RAND First Quarterly Report,
June 1946[28]

In March 1946, the U.S. Army Air Forces instituted Project RAND with a highly unusual contract. Prior to that date, virtually all peacetime military contracts specified in detail the goods and services to be provided by the contractor. The Project RAND agreement, however, paid the Douglas Aircraft Company $10 million ($109 million in 2008) over four years to conduct, "a program of study and research on the broad subject of intercontinental warfare, with the object of recommending to the Army Air Forces preferred techniques and instrumentalities for this purpose." Exactly what Douglas Aircraft would deliver to the military to meet these requirements was left intentionally undefined.

Behind this lack of definition, however, lay considerable clarity of purpose. Most importantly, the Army Air Forces and industry leaders sought to perpetuate the World War II alliance among military, industrial, and academic research. Project RAND would serve as a mechanism through which American industrial and academic intellectual resources could be harnessed to military problems in peacetime. In this sense, Project RAND served as the transitional device between the temporary military-industrial-academic alliance of World War II and the permanent structures characteristic of U.S. science and technology during the Cold War. RAND would be a Manhattan Project without end.

Indeed, Project RAND's research agenda was no less ambitious than that of the Manhattan Project. Whereas the Manhattan Project's objective was to transform military weaponry, the ambition of Project RAND was to affect a revolution in military decision-making. Specifically, the project's management and researchers committed themselves to creating a comprehensive and rigorous science of warfare. This new science would incorporate a wide range of intellectual disciplines and methodologies, identify strategic and tactical choices, evaluate scientifically each alternative, and determine optimal military and political decisions. As a result of Project RAND's work, military policies and decisions would be based on systematic, rationally derived science rather than experience and intuition.

Project RAND's research teams were further motivated by two broader aspirations. First, Project RAND offered a focal point for the rapidly growing field of applied mathematics. Techniques developed during World War II along with dramatically expanding machine computation capabilities promised to transform mathematics, if only practitioners of the new mathematical techniques could overcome the resistance of orthodox mathematicians who dominated the nation's university departments. Project RAND provided a secure and supportive venue in which these maverick mathematicians could practice and develop applied mathematical

concepts. Second, the elaboration of a science of warfare created a realistic opportunity to reintegrate the various physical, mathematical, and social sciences into a single intellectual framework – a goal that had eluded American and European scholars for centuries.[29] Project RAND's early research leaders anticipated the construction of a truly integrated method of analysis to which virtually all branches of knowledge would contribute.

Finally, the deepening confrontation between the U.S. and the Soviet Union also shaped the formulation of Project RAND's research program. For military and political leaders who were convinced that the growing Cold War rivalry would be resolved only in a global atomic war and the extinction of one side, Project RAND presented an avenue through which the military establishment might influence American public values and marshal them in the interests of national defense.

The Genesis of Project RAND, 1943-1947

The creation of Project RAND in March 1946 reflected a confluence of interests among three groups that had played pivotal roles in the American war effort: the Army Air Forces, the U.S. aircraft industry, and American scientific experts. While each of these groups was motivated by particular concerns as the United States entered the post-World War II period, all three drew a set of core conclusions from their shared experiences in the war. Foremost among these was the lesson that scientific research and development had been decisive in America's victory. Unprecedented coordination among military, industrial, and academic interests during the war had produced spectacular technological advances such as radar and the atomic bomb—weapons considered by many historians as shaping the war's outcome. However, the mobilization of this complex alliance had been time-consuming and beset with false starts. Only America's geographic isolation had permitted the nation to overcome its utter unpreparedness for war and to muster its scientific resources for the fight. A consensus of American policymakers, military leaders and scientists, however, believed that the next war would be very different and would afford the United States no such luxury. Still scarred by the devastating impact of the Japanese "sneak attack" on Pearl Harbor in 1941, American policymakers assumed that the next war would be fought with long-range missiles and aircraft delivering horrific atomic weapons with little or no advanced warning. Laggards in military and scientific preparedness, as the United States had been in 1941, would stand no chance for survival.

Conflicting with this perceived need for continued military-industrial-scientific cooperation was the well-founded belief that America's best scientific talent would refuse to work directly under military, or even industrial, supervision in peacetime. The national emergency had overshadowed, temporarily, academic aversions to military research sponsorship, but most scientists continued to regard the military establishment as an unsuitable place to work in peacetime. While many scientists agreed that national survival demanded continuation, in some form, of the wartime alliance, most were eager to return to their universities at the conclusion of the war. The impetus for this lay mainly in the culture of American science. While wartime work under military auspices had been exhilarating, most scientists prized the status and freedom that came with prestigious university appointments. Thus, the challenge for policymakers was to construct a mechanism that would permit continued engagement of top scientific and technical expertise in national security problems while evading scientists' disinclination towards direct military employment.

Two men who took up this challenge were Arthur E. Raymond[30], chief engineer of the Douglas Aircraft Company, and his assistant Frank R. Collbohm[31]. Both were involved closely in wartime aircraft development at Douglas and worked in coordination with senior Air Force

personnel and scientists engaged in various air-related programs. In 1942, for example, Collbohm was looking for ways to adapt Douglas A-20 aircraft for the night-flying missions required by the British Royal Air Force. Having heard of the radar project underway at the Massachusetts Institute of Technology's Radiation Laboratory, he ventured to Cambridge to inspect the work. At the Radiation Laboratory, Collbohm met scientists Edward L. Bowles[32] and Lee DuBridge, who took the Douglas engineer onto the roof of the laboratory and, in a foggy New England rain, demonstrated the ability of their device to track unseen aircraft. Collbohm was highly impressed, not only by the radar technology specifically but by the general ability of civilian scientists to reshape military technology and tactics. Collbohm recognized that the skills embodied by the university scientists were absent from the military's core competencies. He reported his experience to Donald Douglas, the president of Douglas Aircraft, emphasizing his strong sense that the connection of civilian science with military air requirements, as exemplified at the Radiation Laboratory, would be critical to future American security.[33] Soon thereafter, Collbohm moved to Washington as a "dollar-a-year" man working under Bowles as an expert consultant in the War Department. Bowles' team of approximately one-dozen civilians, including Collbohm, spent much of the war working to coordinate the application of science and technology to the war effort.

Of particular significance, Bowles organized in 1944 the Special Bombardment Project, which was designed to employ advanced mathematical and analytical techniques to maximize the effectiveness of B-29 bomber deployment in the Pacific theater. Bowles selected Douglas's Raymond and Collbohm to direct the study, which comprised both industry experts and military officers and represented the first large-scale participation of civilian scientific expertise in American wartime military planning.[34] The Special Bombardment Project team used operations research techniques to evaluate alternative aircraft deployment systems and found that, by stripping away much of the B-29's protective armor, the bomb load, range, and speed of the aircraft could be dramatically increased. In fact, the performance improvement made the B-29 faster than any operating Japanese fighter aircraft, thus obviating the need for the armor and all but one defensive machine gun. While the results of the project came too late in the conflict to have an impact on Air Force operations, Raymond, Collbohm, and Air Force leaders were impressed by the insights generated and the power of the analytical methods for military planning.

At the same time, beginning in late 1944, Raymond and Collbohm increasingly focused their attention on the problem of continuing the civilian-military research partnership after the war. As Collbohm later wrote,

> [I]t was unthinkable that having set such a tremendous pace of scientific and technological development during the war, the scientists should, in effect, abandon it to return to more academic pursuits. It became increasingly clear that some mechanism would have to be developed which would make it possible to induce scientists to pursue their careers within a military framework—or at least to continue to devote themselves to problems of national security.[35]

With this in mind, Collbohm embarked on a campaign of discussions with military and civilian leaders seeking to construct a mechanism that would serve the interests of three principal groups —the military, the aircraft industry, and top-ranked scientists. As his campaign got underway Collbohm quickly found considerable support for harmonizing these interests.

The Army Air Forces, which would not become an independent service until 1947, were under the command of General Henry H. "Hap" Arnold throughout World War II. Arnold was a vigorous and visionary leader whose overriding objective was the creation of an independent Air

Force. For Arnold, independence was essential to the prosecution of the Air Force's dominant strategic philosophy—the doctrine of air power. Air power doctrine holds that highly destructive air assault on an enemy's homeland can so deplete that foe's economic and psychological war-making capacity that resistance will quickly collapse.[36] The implementation of that doctrine can be recognized in American strategy during World War II, when American and allied powers inflicted overwhelming aerial bombing campaigns on the Axis powers in an attempt to crush their war-making capabilities. Indeed, Arnold and his fellow Air Force chiefs believed that air power had been decisive in World War II, and that air power alone would be decisive in future wars.

Air power doctrine further emphasized the need to preserve the wartime alliance of civilian science with Air Force development and planning functions. Arnold theorized that any nation failing to keep pace technologically would be helpless to stem the onslaught of an adversary's air power. In an Air Force Day speech in 1945, he argued, "If we fail to keep, not merely abreast, but ahead of technological development, we needn't bother to train any force, and we needn't make any plans for emergency expansion; we will be totally defeated before any expansion could take place.[37] Furthermore, Arnold was concerned that the vast aircraft production of the World War II years might impose on the Air Force a period of technological obsolescence. Having been a military pilot since 1912, he well remembered that following World War I, the Army Air Corps had been burdened with an oversupply of Liberty aircraft engines. For years after the war, the air forces were compelled to use those obsolete engines and thereby neglect the continuous development of advanced equipment.[38] In the new world of long-range missiles and atomic weapons, such neglect could prove catastrophic. Thus, the construction of a permanent and productive research and development organization under the ultimate direction of the military was among Arnold's highest priorities.

Along with this objective, Arnold believed that the accelerating pace of scientific and technological advance and the demands of "continual preparedness" required the grafting of civilian scientific and technical expertise onto long-range Air Force planning operations. During World War II, the success of Edward Bowles's "Advisory Specialist Groups" and the Special Bombardment Project directed by Raymond and Collbohm reinforced Arnold's desire to mate civilian technical expertise with Air Force planning. As he and his staff organized the Army Air Forces for the postwar era and independence from the Army, the imperative of technological change shaped their vision of the service's organizational structure. Most importantly, Arnold strove to promote long-term thinking by insulating Air Force headquarters personnel from the distractions of day-to-day operational responsibilities.[39] Up to that time, Air Force leadership had been mired in operational problem-solving which, Arnold believed, prevented effective long-range planning. To remedy this weakness, he pushed day-to-day decision-making downward to the various Air Force commands, thus freeing the headquarters staff to focus attention far into the future. Also, he began looking for a mechanism to integrate civilian scientific and technical expertise into the Air Force's senior planning efforts.

Unfortunately for Arnold and his cohort, the Army Air Forces largely lacked its own laboratory network, and Air Force leaders were well-aware that scientists would be difficult to recruit once hostilities ended. Before the war, aircraft companies and the National Advisory Committee for Aeronautics (NACA) had been the main sources of air research and development, but Arnold and his advisors expected that this disjointed structure would be insufficient for a newly independent Air Force. Arnold thus began constructing a network of cooperation between the Army Air Forces and civilian science that would meet presumed postwar needs. In 1943, Arnold created two planning groups—the Post War Division and the Special Projects Office—to begin constructing a strategy for meeting the Air Force's postwar scientific and technological requirements. In late 1944, he took the further step of instituting an Army Air Forces Scientific

Advisory Board (SAB) under the direction of the brilliant Hungarian mathematician Theodore Von Karman. Von Karman's advisory board included highly respected civilian scientists and provided a visible connection between the military and top scientists. However, the SAB had advisory rather than executive authority; it could make suggestions but could not change policies. As such, the SAB remained a part-time agency incapable of providing continuing and aggressive research support to Air Force leadership.[40] This left Arnold with the need for an ongoing organization that would connect civilian science with Air Force planning and development.

As Arnold faced this dilemma, American aircraft companies confronted a looming crisis. With the hyperproductive war years reaching an end, aircraft makers feared a business collapse and were searching desperately for the means to ensure their postwar viability. The circumstances of the Douglas Aircraft Company in mid-1945 make clear the interests of the American aircraft industry as planning for Project RAND got underway. During World War II, Douglas Aircraft had been the world's largest producer of airframes. Over four years, company production had accounted for one-sixth of U.S. airframe output, and Douglas had single-handedly out-produced the combined aircraft industries of Germany and Japan. In 1945, Douglas's revenues amounted to $744.7 million ($8.8 billion in 2008), and the company employed over 90,000 workers.[41] Within weeks of V-J Day, however, government contract terminations had forced the closing of two of Douglas's six plants, thereby causing the lay-offs of 38,000 employees. Indeed, total contract terminations for 1945 reached an astounding $1.2 billion and placed Douglas's future in considerable jeopardy. In 1946, sales fell 85 percent from 1945 levels. Whereas Douglas had delivered over 31,000 aircraft during the war years, the company sold a paltry 127 in 1946. On one hand, Douglas management recognized that the company would have to maintain its scientific and technological expertise in order to have any chance for survival, especially in the potentially profitable field of guided missile development. On the other hand, the financial straits in which the firm found itself made investment in a large-scale research and development effort seem impossible.

Furthermore, Douglas managers, like many military and civilian policymakers, were influenced by a model of technological development that connected basic scientific advances with technological change. As early as the late nineteenth century, American industrial companies such as Eastman Kodak, AT&T, General Electric, and DuPont had pursued a strategy of investing in basic scientific research with the objective of achieving marketable technical breakthroughs.[42] At DuPont, for example, the work of brilliant polymer scientist Wallace Hume Carothers and others at the firm's laboratory for fundamental research, nicknamed "Purity Hall," led to the development of neoprene and nylon—both remarkably successful commercial products. Indeed, the "nylon model" of innovation, which emphasized basic scientific research, shaped DuPont's research strategy for many decades and served as a model for hundreds of American industrial firms.[43]

World War II brought this model of innovation to the forefront of both military and civilian policymaking since basic scientific research had yielded critical weapons advances. The foremost example was the Manhattan Project, where the work of hundreds of scientists had produced the war's decisive weapon. At the request of President Franklin D. Roosevelt, Vannevar Bush in 1945 codified the implications of the basic science model of innovation for national policy formulation in his study, Science the Endless Frontier: A Report to the President.[44] During the war, Bush had directed the powerful Office of Scientific Research and Development, which ultimately spent $450 million on weapons research and development and played a key role in many of the war's critical technical breakthroughs. In Science the Endless Frontier, he advocated the continuation of government sponsorship of scientific research in the postwar period, thereby laying the groundwork for the creation of the National Science Foundation.

One man who believed strongly in the powerful effect of scientific inquiry for technological development was Douglas Aircraft's Frank Collbohm. Collbohm was a lean, intense former Marine and test pilot whose service during World War II exemplified his intense loyalty to the nascent U.S. Air Force. Despite struggling with an innate disdain for scientific intellectuals, Collbohm was also above all a practical man who believed in the interdependence of science and technology. As the war drew to a close, Collbohm had been conducting conversations with various scientists and other civilian experts in government employ, searching for methods of extending wartime civilian-military cooperation into the postwar period.

Crucially, Collbohm was in a favorable position during these months to gauge the interests of the Air Force, the aircraft industry, and the civilian experts. First, Collbohm remained a top executive of Douglas Aircraft and the first lieutenant of that firm's chief engineer, Arthur Raymond. He thus well understood the challenges facing Douglas and the other aircraft producers as the war ended. Collbohm believed that American national security would continue to depend on the health of the aircraft industry and the ability of that industry to provide technical support to the Air Force. Second, his position in Edward Bowles's wartime consulting group gave Collbohm ready access to top-level Air Force thinking. Bowles was a close advisor to Hap Arnold and largely shared Arnold's views on the need for integrating research and development into long-range Air Force planning. Among his advising duties, Bowles also was responsible for operationalizing Arnold's visions for a postwar Air Force research and planning organization.[45] As part of this effort, he had assigned Collbohm in 1944 to perform a review of the Army and Army Air Forces missile programs—a duty Collbohm continued to execute throughout his tenure in Bowles's office.[46] Thus, Collbohm gained an intimite understanding of Arnold's and Bowles's objectives in structuring a postwar research and development organization as well as, perhaps, the most comprehensive grasp within the military establishment of American missile programs.

By late September 1945, the situation was becoming urgent. With the end of the war, scientists were streaming out of military laboratories and heading back to their university campuses. At the same time, the cancellation of war production contracts virtually halted aircraft production and raised grim prospects for the industry's immediate future. Furthermore, military leaders such as Hap Arnold recognized that the discretionary spending privileges they had enjoyed during the war would soon be curtailed by Congress. If the Army Air Forces were going to use wartime budget surpluses to institute a postwar research organization, they would have to move quickly. Time was running short, and after discussions with Arthur Raymond and Donald Douglas, Jr., Collbohm brought Bowles a proposal for a mechanism that would harness civilian science to the peacetime Air Force.[47] Collbohm and the Douglas managers had crafted the outline for an innovative organization that they thought would meet the needs of the Air Force, the aircraft producers, and attract capable scientists and technicians. First, the organization would be housed in industry, specifically within Douglas Aircraft, since there was consensus that top scientific talent would not work within the military establishment and that universities would be unwilling to host the highly classified work to be undertaken. Douglas Aircraft, in turn, would use subcontracts to draw the other major aircraft producers into participation in the project. Second, the project would be funded by the Air Force but would operate largely autonomously, concentrating its attention on the problems associated with atomic weapons and long-distance missiles. Third, the project would be very broadly defined, thus permitting it to address the full range of problems associated with the development, deployment, and use of intercontinental guided missiles. In other words, this would not be a standard procurement contract geared towards the production of a specific weapon. As Bowles related to Assistant Secretary of War for Air Stuart Symington, Collbohm "made clear to us that Mr. Douglas personally was interested in establishing a basic research organization in air techniques—sometinng (sic) that would be of

value to the future of air as an instrument of national security."[48] Finally, the new organization would be attached directly to the highest levels of the Air Force structure, thus providing direct scientific and technical input to Air Force planning processes.

Bowles took Collbohm to see Hap Arnold, and Arnold's response was "immediate and emphatic." As Collbohm recalled,

> I had barely had time to complete my discussion when he interrupted me and instructed me to get hold of Donald Douglas at once. Mr. Douglas and I were to shape up a specific project immediately and then to meet him for lunch the day after next at Hamilton Field in California.[49]

In fact, Collbohm was swimming with a very strong current, and his success with Arnold should hardly have been surprising. The Army Air Forces had, for many months, been considering the option of establishing an industrial research organization that would provide the service with long-range scientific and technological guidance. It is likely that Arnold and Douglas had discussed the idea of an industrial research organization based at Douglas Aircraft well before Collbohm and Bowles presented their ideas. As Collbohm later recalled of the events, "Doug and Arnold already knew what they were talking about, I think. It certainly sounded that way."[50]

In any case, the creation of Project RAND was underway and proceeded rapidly over the next six months. While Collbohm developed a formal proposal, Arnold instructed his staff to have $30 million in surplus research funding transferred from the Wright Field budget to his headquarters budget for use in research related to guided missiles, one-third of which would be used to support Collbohm's brainchild.[51] The general's staff also outlined a spectrum of nearly thirty potential projects to explore a spectrum of issues related guided missile development. Douglas and Collbohm latched onto one of these - a long-range research program directed toward the achievement of an intercontinental guided missile - as the immediate focus for their program.[52] The new project would be established as a division of Douglas Aircraft, but independent of the firm's regular engineering operations. It would be largely autonomous from Douglas's normal administrative activities, and would both employ top engineering talent from within Douglas and recruit staff with special skills from outside the company. Most importantly, while focused on guided missile development, Arnold insisted that the charter of the new project would be very broad, involving "consideration of our strategic resources and plans and a comparison of various means of long-range air war, including conventional technique, semi-conventional . . . and the unconventional. . . ."[53] In his report of the luncheon meeting to Secretary of War Patterson, written three days after the conference, Bowles described the organization that Arnold and Douglas had agreed upon, and that he was now charged with constructing:

> I expect to recommend that [the Douglas project] deal with a study having for its object the determination of the trend of air techniques in the future. An analysis of our transport, strategic and tactical air operations, together with the information we have on enemy air, including V-1 and V-2 phases, should enable us to extrapolate intelligently into the future. This extrapolation should, by its very suggestion of trends, help the military, industry and civil air better to determine policies and plan research and development. I should propose that this study be made on neutral grounds and that it not be limited to the nature-science aspects, but include as equally important the social and political science aspects."[54]

Bowles' concluding sentence is particularly important because it expresses the intent, which was present from Project RAND's genesis, of complementing technical and scientific expertise with social scientists so that the broadest possible view of warfare could be adopted. Thus, by early October 1945, Project RAND was conceptualized as a program of long-range, comprehensive air warfare studies incorporating a diversity of academic disciplines and connected directly to top-level Air Force planning.

Project RAND Gets Underway, 1946-1947

To prepare the Army Air Forces for independence and, in part, to set the stage for Project RAND, Hap Arnold and his staff embarked on a fundamental reorganization of the air corps' research and development management structure in late 1945. Prior to World War II, air research and development had been conducted mainly by NACA and the aircraft companies. During these years, the Army Air Forces Technical Services Command (ATSC)—what would become the Air Materiel Command in 1947—had jurisdiction over the service's research, development, and procurement contracts and thus played a central role in research management. Traditionally, ATSC would develop the desired requirements for a new weapon system and then let contracts to industrial suppliers for the development and manufacture of that system. ATSC worked on a basis of strictly defined weapons characteristics, which mired research and development in the Army's slow-moving, heavily bureaucratic materiel function. In a world of continual and rapid scientific and technical advance, however, Arnold and other top Air Force leaders believed that research and development of such advanced weapons as intercontinental guided missiles had to be removed from the orthodox procurement system.

Immediately after the 1 October meeting at Hamilton Field, Arnold instructed Bowles to work with General Carl Spaatz, who would succeed Arnold as commander of the Army Air Forces in just four months, to create a new research and development command. Spaatz and Bowles subsequently recommended that Arnold institute a Deputy Chief of Staff for Research and Development (DCS/R&D)—an officer who would be third-ranking on the Air Staff. The new DCS/R&D would administer Project RAND as well as the Air Force's other research and planning activities, thus removing these activities from the procurement bureaucracy and attaching them to the pinnacle of Air Force management. Arnold accepted these ideas and on 5 December 1945, the Army Air Forces officially created the office of DCS/R&D.[55]

To emphasize the importance of the new office, Arnold selected as its first occupant one of the service's most aggressive rising stars—General Curtis E. LeMay. LeMay was a hard-charging warrior whose fame arose from numerous B-17 bombing campaigns in the European theater and his command of the Twentieth Air Force in the Pacific theater. Continuously champing a cigar so as to quell an uncontrollable facial tic, LeMay had led the overwhelming B-29 bombing campaigns that inflicted horrendous destruction on Japan and provided empirical support for the air power theory. As Martin Collins observes, "In choosing to give priority to the research and development position, Arnold was also indicating that this was the best use of one of his finest officers."[56]

At the same time Spaatz and Bowles were designing the new R&D command, Bowles was working with Collbohm on an innovative contract that would define and institute Project RAND. Essentially, they used the OSRD wartime contracts as a model so as to protect the Douglas project from ATSC jurisdiction. Unlike ATSC contracts, which specified the characteristics of the weapon to be developed, the OSRD contracts did not delineate a particular end product with carefully itemized performance characteristics. Instead, the OSRD agreements specified that the contractor would engage in research within a general field of interest with a weapon or device as

an ultimate goal. The contract that Bowles and Collbohm envisioned, however, took the OSRD arrangements a few steps farther by broadening the concept of research to include collaboration in Air Force planning.[57] The Douglas project would point the way towards weapons advances, but more importantly the project would help Air Force leadership envision the future of air warfare and plan accordingly.

With these goals in mind, Collbohm drafted, in December 1945, a document entitled "Research and Development Contract: Long Range Air Power."[58] In his proposed agreement, Collbohm wrote that the Douglas project would "provide means for establishing an effective teamwork of science, engineering, industry, and the military with the objective of determining an optimum system for conducting long-range air warfare."[59] Crucially, Collbohm's draft contract adopted a broad notion of the problems to be addressed by the project. Rather than simply focusing on the technical requirements for a missile system, Collbohm proposed "an over-all study with an analysis of those factors which are primarily of geographic, political or strategic nature."[60] Here, Collbohm expanded on his experience with the Special Bombardment Project, in which he had worked with a diverse group of experts to analyze a complex military problem. To provide the Air Staff with the planning advice it needed, Collbohm argued, the project had to embrace the full range of factors—technical, economic, political, social—that would shape the deployment and effectiveness of intercontinental missile systems. Clearly, the procurement of such expertise was unprecedented in peacetime Army Air Forces experience.

Curtis LeMay carried the ball when the ATSC mounted a vigorous campaign to regain jurisdiction of the proposed Douglas Aircraft contract. Although he championed Project RAND, the gruff general quickly ran into the ATSC's arrayed defenses. Between October 1945 and April 1946, the entrenched ATSC leadership twenty-eight separate guided missile contracts, including contracts that infringed on the charge to be given to the Douglas missile project.[61] On one hand, Arnold and his staff had created the DCS/R&D position largely to break ATSC's monopoly over research and development activities and to connect outside scientific and technical expertise directly to service leadership. However, Douglas management could not afford to ignore ATSC's demands since the vast preponderance of the company's contracting activity would remain under that command's direct control. As such, the Project RAND contract would have to be negotiated with the ATSC, not merely imposed on that organization.

On 21 February 1946, just two weeks after the retirement of Hap Arnold from command of the Army Air Forces, LeMay held a conference of his staff, Bowles, Collbohm and several Douglas representatives, and ATSC leadership to resolve the Douglas missile contract matter. Collbohm presented a refined version of the contract he had drafted in December 1945. General Laurence C. Craigie, the commander of ATSC, then presented a counterproposal for a missile development project that would proceed along established contract traditions. Craigie argued that Douglas should work towards the development of missiles with precisely defined performance characteristics established by the Air Force.[62] After Craigie's presentation, LeMay asked Bowles to comment on the two proposals and offer an opinion of their relative merits. Not surprisingly, Bowles argued that whereas the ATSC proposal was relevant for a traditional procurement situation, such an arrangement would not meet Air Force needs in the new era of intercontinental, high-tech warfare. He did recognize the tender situation in which the missile project placed Douglas Aircraft—that is, between the new DCS/R&D and the ATSC—so he tempered his advice that ATSC be excluded from the Douglas project with the suggestion that ATSC be "kept in channels."[63]

By championing the open-ended, independent nature of the Project RAND contract, LeMay had sided with Bowles and Collbohm against the ATSC. At LeMay's instruction, Bowles drafted a statement of work for the Douglas project, which recommended that Douglas be contracted for

"A study and research on the broad problem of intercontinental warfare, exclusive of surface warfare, with the objective of making recommendations to the Army Air Forces as to techniques and devices."[64] What by then had become known as Project RAND—a loose acronym of "research and development" conceived by Arthur Raymond—was established with a letter contract dated 2 March 1946. Significantly, the frictions between Project RAND and the ATSC, which would soon be renamed the Air Materiel Command, would continue well into the future. The statement of work defined by Bowles and Collbohm at LeMay's request would also prove highly durable as it described first Project RAND's then the RAND Corporation's program for many years to come. As such, it proved to be a seminal policy document – nothing less than the institutional genesis of the Cold War military-industrial complex.

Project RAND's Early Objectives

At its inception, Project RAND had less than a handful of full-time employees including Dr. James E. Lipp, a Douglas Aircraft engineer who would lead Project RAND's missile research, J. Richard Goldstein, a long-time associate of Collbohm's at Douglas who former had been chief of Douglas Aircraft's research laboratories and now assumed the project's associate directorship, and L.E. Root, another Douglas Aircraft engineer. These men made their home in a secure wing of the Douglas Aircraft plant in Santa Monica, California, that was separated from the rest of the facility by thick glass doors – symbolic of their cosseted status. Set up as a new and autonomous department of the Douglas Aircraft Company, Project RAND reported directly to Arthur Raymond, Douglas's vice president of engineering. As it grew from this initial nucleus, Project RAND's staff comprised mainly physicists, engineers and mathematicians and was divided into the project's permanent research staff—mostly Douglas Aircraft transferees—and an expanding network of consultants who maintained their primary positions at research universities or laboratories but worked under contract on RAND projects. The high caliber of Project RAND's personnel even during these early months is reflected in its corps of nuclear science consultants, which included Luis Alvarez, Edwin McMillan and Robert Serber of the University of California at Berkeley, Louis Ridenour and Leonard Schiff of the University of Pennsylvania, and George Kistiakowsky of Harvard. Finally, Project RAND also opened a small office in Washington, D.C., under the direction of Lawrence Henderson Jr. Henderson was a Harvard-trained lawyer who had worked with Collbohm in Edward Bowles wartime organization and was one of Collbohm's earliest recruits to join Project RAND. From May 1946 until his retirement in 1971, Henderson was the organization's eyes and ears in the capital. He worked the government and military bureaucracies, arranged meetings, and, most importantly, kept RAND management and researchers aware of Air Staff developments on a day-to-day basis.

During its first months of operation, Project RAND assumed the organizational form of a rather orthodox engineering operation. Arthur Raymond remained the nominal head of the project, but Frank Collbohm, as Raymond's chief assistant, had assumed responsibility for executive management. After six months of operation, Project RAND employed two full-time administrators (neither Raymond nor Collbohm were full-time employees of Project RAND at this point), including J. R. Goldstein, and twenty-three full-time researchers. In keeping with Project RAND's engineering pedigree, Collbohm had organized the project's research staff into three principal "sections" corresponding to the main tasks then underway: the Satellite Study Section, the Interim Study Section, and the Evaluation of Military Worth Section. Whereas the satellite and interim sections employed all but three of Project RAND's researchers, and composed mainly of engineers and scientists, the Evaluation of Military Worth Section provided the kernel of a research program that, eventually, would distinguish RAND.

Project RAND's earliest work concentrated on engineering and technical studies of advanced aviation issues, which is not surprising given the preponderance of engineers and scientists among the early staff and the project's association with Douglas Aircraft. For example, the project's first study was a short but intensive analysis of design options for an earth-circling satellite vehicle—a project described in greater detail in the next chapter. In April 1946, the Army Air Forces requested that the new RAND team take up the study of satellite vehicles in a crash program requiring the maximum effort of the entire Douglas Aircraft organization.[65] The satellite project took only three weeks to complete, but it involved approximately fifty of Douglas's best scientists and engineers working simultaneously on the study. In fact, the urgency of the satellite project required Douglas Aircraft to divert top manpower for its Santa Monica Engineering Department and to delay other projects currently underway. On one hand, this imposed severe difficulties on the Douglas Aircraft organization as a whole, as development and production schedules were thrown into disarray. From Frank Collbohm's perspective, however, the satellite project offered an opportunity to expose Douglas's best talent to the new Project RAND department and its research agenda—a circumstance that aided the project's rather awkward recruiting process.

Over Project RAND's first year, engineering and scientific studies dominated the staff's activities. These included studies such as those mentioned above, as well as a high radiation "Death Ray" weapon project, analysis of guided missile-strategic bomber interception, atomic propulsion research, and a series of rocket propulsion, control and communication studies growing out of the initial satellite project.[66] RAND subcontracted much of the laboratory research for these studies to contractors such as the Collins Radio Company and Battelle Memorial Institute, thus allowing the project's researchers to engage the more analytical and esoteric aspects of the work. Despite the unusual subject matter of these projects, however, such technical and scientific analyses conformed only to a narrow interpretation of Project RAND's contractual mandate to undertake "A program of study and research on the broad subject of intercontinental warfare . . ."[67]

Such was not the case in the Evaluation of Military Worth Section. The concept of "military worth" does not resonate in current scholarship, but it was one familiar to the numerous academic and industrial experts who contributed to the U.S. government's World War II efforts. During the war, government organizations such as the Operations Analysis (or Operations Research) units of the Army Air Forces and the Navy, the Joint Target Group of the air forces, and, especially, the Applied Mathematics Panel (AMP) devoted extensive effort to analyzing, quantifying and forecasting the respective "worth" of various wartime operations. Such military worth evaluations most frequently used advanced mathematical analyses and very simple criteria to evaluate the relative value of a range of tactical alternatives. For example, one of the analyses undertaken by the AMP used mathematical modeling to quantify the likely outcomes in fighter-to-fighter air combat of competing fire-control devices. In this way, mathematics could be used to evaluate the "worth" of alternative approaches without time-consuming and costly testing. Both Arthur Raymond and Frank Collbohm had been deeply involved in the application of operations research techniques to Air Force planning during the war, and both men had been profoundly impressed by the effectiveness of the AMP studies. As a result, Raymond and Collbohm determined to incorporate further elaboration of the military worth concept in Project RAND's research agenda.

Their interest was so great, in fact, that both men hoped to recruit Warren Weaver, the wartime head of the AMP, to serve as Project RAND's director. As World War II drew to a close, Weaver's efforts at AMP had focused increasingly on constructing a general theory of military worth—an ambitious undertaking that fit well with Project RAND's objectives. Indeed, Weaver published in January 1946 a classified essay entitled, "Comments on a General Theory of

Air Warfare," in which he detailed his thoughts for a mathematically-based science of warfare.[68] However, Weaver was eager to resume his prewar position at the Rockefeller Foundation, and while he provided regular and extensive advice as a RAND consultant, he declined the directorship of the project.

In his stead, Weaver recommended that Collbohm hire John D. Williams, an eccentric but exceptionally capable astronomer and mathematician who had led the AMP's Statistical Research Group at Columbia University, to lead RAND's military worth efforts. Obese and charming, Williams was Collbohm's alter ego – an academic whose intense appetite for life included throwing wild parties and racing his powerful, radar-equipped Jaguar along the Pacific Coast Highway at speeds up to 150 miles per hour. Williams believed that every human activity could be understood and explained by rational, mathematical analysis, and he shared Warren Weaver's faith that mathematics could provide the foundation for a science of warfare that incorporated contributions from a wide range of academic disciplines. With Weaver's assurance that Williams was, "the laziest man that [I] have ever met and therefore could be relied on to find an easy way to solve hard problems," Collbohm hired Williams to head Project RAND's Evaluation of Military Worth Section.[69] When Williams joined Project RAND in June 1946, he brought both the vision of a new type of research organization dedicated to the scientific study of warfare and Weaver's blueprint for a general theory of air warfare. Acting as Frank Collbohm's closest advisor over the coming years, John Williams' played a central role in both constructing the Project RAND organization and in developing what would become RAND's signature methodology—systems analysis.

The Origins of Systems Analysis

The new knowledge domain described in Weaver's "Comments on a General Theory of Air Warfare" and embraced by Frank Collbohm and John Williams at Project RAND was to incorporate to an unprecedented extent not only the recent advances in applied mathematics and computational capabilities, but also a wide range of "soft sciences" such as economics, psychology, and political science. Along with the organizational innovation that brought these diverse disciplines together in Project RAND, however, the construction of a science of warfare required the development of a new set of methodologies. Specifically, to operationalize this new field of intellectual endeavor, Weaver and the Project RAND architects envisioned a means of analysis that would harmonize inputs from a wide range of sources, facilitate rigorous mathematical and scientific analysis, and generate output that could be delivered effectively to military policymakers.

In his "Comments" paper, Weaver used the analogy of an imaginary "Tactical-Strategic Computer" (TSC) to represent the methodology required to operationalize a science of air warfare.[70] Weaver's objective was to describe the contours of a methodology that would permit the analytical optimization of military strategy and thus provide a scientific decision-making tool for American military and political leaders. Although in Weaver's description the inner workings of his fanciful TSC remained a "black box," the TSC's mode of operation expressed his and the Project RAND researchers' ambitions for an analytical methodology that would quantify and manipulate the thousands of variables associated with modern warfare. Principally, Weaver's TSC had a series of control knobs, each representing one of the myriad variables associated with the analysis of warfare. Some of the basic variables would be under the enemy's control, and some would be determined by physical laws and "nature." Nevertheless, each type of variable would have to permit the use of value ranges or statistical approximations as inputs to the computer. In addition, there would be a wide range of "decision variable" knobs that would

represent the key policy decisions to be made by American leaders. The settings of these decision variable controls would essentially define the parameters of specific alternative national defense strategies. At the center of Weaver's TSC's control panel would be the core output mechanism —the "military worth" meter. The military worth meter would move as the other variable knobs were adjusted, thus displaying the quantified value of the particular defense strategy described by the current configuration of variable inputs. Weaver's hypothetical computer—a proxy for the methodology required for a science of warfare—therefore offered a "scientific" means of constructing an optimal military strategy by maximizing the military worth measure. The challenge for Frank Collbohm, John Williams, and the growing Project RAND research staff was to put methodological meat on the conceptual skeleton that Weaver had constructed in his "Comments" paper. Most importantly, Project RAND researchers faced the difficult, if not impossible, task of creating a new methodology that would accomplish the functions of Weaver's computer. These exertions would yield RAND's signature methodology – systems analysis.

The story of systems analysis at RAND begins in the organization's earliest days. As the project got underway during 1946, its leaders adopted a two-pronged strategy for the development of a methodology that would meet the requirements set forth in Warren Weaver's paper. Although their ultimate goal was to create a methodology that would permit the scientific analysis of long-range military planning, the heavily technical and scientific composition of the project's research staff dictated that RAND begin by applying relatively orthodox techniques to short-range problems. Until Williams could reconstruct at RAND a version of the AMP, early efforts would focus on the engineering and scientific aspects of military planning issues, thereby leveraging Project RAND's initial skill set and capabilities. Following the intensive initial phase of the earth-circling satellite project in 1946, Project RAND's undertook the "Interim Study"—an operations research project designed "to evaluate the possibilities and limitations of current or nearly developed new weapons" in advance of RAND's taking up more ambitious analyses.[71]

The Interim Study began in the summer of 1946 under the direction of L. E. "Gene" Root, the former chief engineer of Douglas Aircraft's El Segundo (California) plant who would soon become the head of Project RAND's Airborne Vehicles Section. Whereas Project RAND's goal was to develop a methodology for analyzing long-term military requirements, the Interim Study was undertaken so as to provide the AAF with immediately useful information on aircraft systems that would be available in the short run. Initially, the study team concentrated on analyzing the interrelationships among such variables as weight, payload, engine type, wing design and speed across a range of conventional (non-jet powered) aircraft including the B-29, the B-50 (a modification of the B-29), and the B-36 bombers. In fact, the Interim Study comprised numerous component analyses performed both by Project RAND personnel and by subcontractors such as Battelle Memorial Institute, Collins Radio Company, Western Electric Company and several aircraft companies. Being almost exclusively technical in nature, the interim work was, by Project RAND's definition, just an opening effort in the larger puruit of a comprehensive analytical methodology. In the project's report of the Interim Study, RAND management made clear that lessons learned to date would be incorporated into a long-range study of far greater complexity and importance:

> This work will eventually be extended to include rocket propulsion, pilotless aircraft, and long range missiles. This phase of the study may be considered as directed toward means of offense, taking into account operations from fixed and mobile bases as well as from our mainland. It is hoped that the study will result in a body of information making possible evaluation of the effects of various requirements upon the offensive means.[72]

Specifically, Root and the Project RAND team determined to fold into the Interim Study framework analyses of the location and importance of enemy (presumably Soviet) targets, the type and number of bombs required to destroy those targets, the location and maintenance of bomber bases, the alternative systems of aerial vehicles that might deliver air attacks, the range and performance of bombers and cargo aircraft, bomber vulnerabilities to fighter and missile attacks, and factors limiting the military use of those aircraft. By early 1947, the objectives of the Interim Study had been redefined along these more ambitious lines, and the work was being described in Project RAND documentation by a new name—systems analysis.

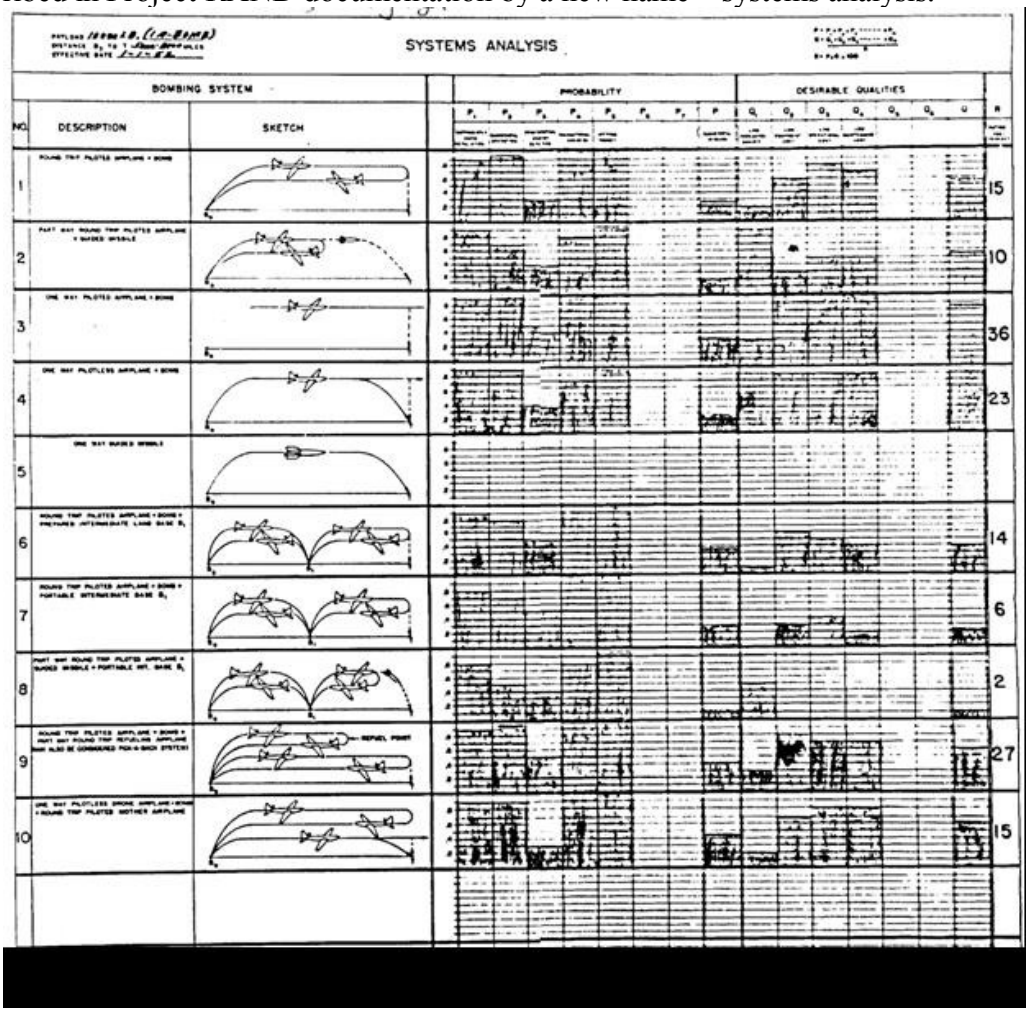


Table 1. Project RAND Atomic Bombing Systems Analysis, 12 December 1946
Source: Arthur E. Raymond, "Talk on Project RAND at First Advisory Council Meeting, 12 December 1946," RAND Document RAD-74, 12 December 1946.

Key:
Payload: 10,000 pounds (1 atomic bomb)
Distance Base to Target: 5000-6500 miles
Effective Date: 1 January 1952

Probabilities:
P_1= Sufficiently rapid retaliation
P_2= Successful operation

P_3= Penetrating enemy defenses
P_4= Navigational success
P_5= Hitting target
P= Sum of P_{1-5},

Desirable Qualities:
Q_1= Low personnel danger
Q_2= Low equipment costs
Q_3= Low operational cost
Q_4= Low maintenance cost
Q= Average of Q_{1-4}
R= Rating of alternative, 100 is perfect

By early 1947, the Interim Study had been renamed the Aerial Bombing Systems Analysis, and broadened to include nine alternative bombing systems assuming a 5,000 mile range and a 10,000 pound bomb load (the parameters of an atomic bomb attack on the Soviet Union). The term "systems analysis" had come to Project RAND from the Douglas Aircraft Company, where systems analysis had been used by aircraft developers to allow elementary quantitative comparison of alternative designs. RAND's researchers, however, envisioned the metamorphosis of systems analysis into a far more sophisticated and precise method for warfare planning. In early 1947 Arthur Raymond described systems analysis to a group of Air Force leaders:

> We have for some time been developing a method of conducting this Systems Analysis into which may be fed the facts which you give us or which we develop in our detailed technical studies. This method is what we have chosen to describe here today. It must be emphasized that the method rather than the facts is what is significant at the present time. Conclusions will emerge and become more certain as the volume and quality of the facts improve with further study."[73]

In some ways, the systems analysis envisioned by Project RAND leaders during the late 1940s constituted a conceptual reversal of World War II operations research. Under the operations research rubric, analysts sought to determine optimal strategies and tactics given existing weapons capabilities and resources. RAND's approach, however, was to reverse this usual planning pattern such that general strategic requirements would be assumed, and research would be directed towards describing the optimal weapons systems within the nation's capabilities. The ultimate goal was the creation of a scientific methodology that would allow integrated analysis, on rigorous mathematical bases, of all meaningful aspects of intercontinental warfare.

Table 1 illustrates the technical nature of Project RAND's early systems analyses by graphically representing the content of Gene Root's Aerial Bombing Systems Analysis in early 1947. Under Root's direction, Project RAND engineers identified and graphically represented ten alternative aerial bombing systems.[74] They then calculated a series of component task probabilities for each delivery system and presented these in bar chart form on a scale from zero to 1.0. These probabilities corresponded to the likelihoods of sufficiently rapid retaliation, successful operation, penetration of enemy defense, navigational success, and hitting the target. The RAND analysts then averaged these component probabilities to produce a total probability of mission success. Also, they rated each system on a scale from zero to 100 (100 being perfect) according to its performance relative to four desirable qualities: low personnel danger, low

equipment cost, low operational cost, and low maintenance cost. The project researchers then averaged the quality ratings to provide an overall quality index for each system on the same zero to 100 point scale. Finally, they multiplied each system's overall total probability of success by its overall quality rating to yield its system rating, again on a scale from zero to 100.

Project RAND's next step was to extend the methodology such that systems analyses could be projected well into the future, rather than being confined to existing weapons systems. By March 1947, RAND's staff had devised a method for appraising the capabilities of aerial bombing systems as far forward as 1955.[75] To accomplish this analysis the RAND team adopted an "efficiency-time" concept that allowed the useful life of a given bombing system to be quantified and incorporated into the earlier performance rating system. In essence, the researchers assumed that the life history of a weapon could be condensed into a graphic representation where time was measured on the horizontal axis and efficiency on the vertical axis. For example, "surprise" weapons such as the V-1 rocket would have high initial efficiency ratings, but these would decline rapidly over time as the opponent devised effective countermeasures. On the other hand, more slowly-developed weapons, such as radar, would have gradually rising efficiency curves over their first years then display more extended useful life-spans. By focusing their attention on quantification of the numerous factors that constituted the efficiency-time profiles of various weapons systems, the RAND systems analysts believed they had arrived at a basic mechanism for calculating the relative efficiency of systems as a function of time.

Unfortunately, this was far easier said than done. In mid-June 1947, RAND's aerial bombing systems analysis group reported that they had identified a series of functions that if properly calculated over time for each alternative under consideration could be integrated into overall efficiency-time functions.[76] The component functions (all calculated over time to 1955) included elementary probabilities for usable bases, successful flight to the target area, target identification, successful weapons launching, and successful weapons flight, as well as the probability of "normal aiming," the expected mean radial error of the weapons, and the probability of a hit. Each of these component functions, however, would have to incorporate mathematical representations for an astounding number of factors. The probability of normal aiming, for example, would at minimum have to include consideration of the evolution of techniques and equipment, the training of crews, the performance of crews under various levels of combat stress, and the range of enemy capabilities that the attacking aircraft might encounter. If RAND was to create a science of war, however, these obstacles would have to be overcome.

This was an ambitious project, but by mid-1947 it had fallen to the direction of an ambitious man. In the late spring of 1947, RAND recruited Edwin W. Paxson from the Naval Ordnance Test Station (NOTS) to assume direction of the project's core systems analyses. During World War II, Paxson had worked with Warren Weaver and John Williams on the Applied Mathematics Panel and had performed operations research for the U.S. Eighth Air Force in Europe. At the conclusion of hostilities, Paxson worked as a consultant on the U.S. Strategic Bombing Survey, and in 1946 he assumed the co-directorship of the mathematics department at NOTS, where John Williams had been among his subordinates.

Paxson also was an early enthusiast of the emerging mathematical theory of games, and he anticipated its broad applicability to war planning. In 1944, John von Neumann and Oskar Morgenstern published their seminal book, Theory of Games and Economic Behavior, and initiated serious scholarly work in the field by proving the fundamental theorem of game theory.[77] That is, they proved that in two-person, zero-sum games of mixed strategies, optimal mixed strategies exist and can be calculated for both opposing players. While von Neumann and Morgenstern had intended their work to be used primarily by economists in constructing a mathematical theory of behavior, the book's relevance to Project RAND's task of constructing a

science of warfare captured John Williams' attention. With Frank Collbohm's assistance, Williams convinced Paxson to join him at Project RAND and to take over direction of the ongoing systems analyses.

In joining Project RAND, Paxson brought with him a conviction that game theory might provide a vehicle for the mathematization of conflict. As the co-director of mathematics at NOTS in 1946, he had corresponded with John von Neumann and made early applications of the von Neumann-Morgenstern theories to naval tactics.[78] Paxson believed the theory of games to be applicable to three types of war situations. First were what Paxson referred to as "tactics in the small," an example of which could be found in submarine chasing. In a situation where a destroyer was equipped with sonar gear of a given maximum and minimum range and an excluded region in its wake and a submarine target was provided with similarly constrained sound equipment of certain ranges, it seemed possible to calculate the optimal strategies that might be adopted by the two "duelists." The second type of problem, "tactics in the large," consisted of problems arising when more complex forces were engaged. For example, game theory appeared to offer the means to quantify decisions as to how a force of interceptors might be divided to engage optimally an incoming force of attackers.

Finally, Paxson argued that game theory could serve as the mathematical foundation for a scientifically rigorous theory of warfare – a means of replacing human intuition with mathematical precision and thus cutting through the "fog of war." In correspondence with von Neumann, Paxson argued that in the engagement of very large forces the choice of "strategy," in the game-theoretic sense, could be reduced to weapons choice decisions. These choices, in turn, could be mathematized by developing values for all relevant weapon system performance criteria. In air combat, for example, the capabilities of various weapon systems could be quantified by evaluating variables such as aircraft control, speed, flying range, rate of fire, number, and the lethal range of onboard weapons. Each specific choice by each side would lead to a particular game "in the small" and, by considering the total situation to be a continuum of games in the small, the quantification of the overall situation (the "supergame") could be achieved. Paxson concluded that by developing ever more complex analyses of offensive and defensive supergames and then combining these, it was possible to construct a science of war. Within months of presenting these ideas to von Neumann, Paxson would be given the opportunity to actualize them as the director of Project RAND's systems analyses.

In early 1947, Paxson took command of the aerial bombing systems analysis and pushed it in new directions.[79] First, he cut the range of alternative bombing systems from ten to six by limiting consideration to manned bombers powered by conventional reciprocating or jet engines and flying at subsonic speeds. Second, he concentrated analytical attention on six components of the overall bombing problem: 1) airplane performance, capabilities, and limitations, 2) attrition losses to be expected in bombing operations due to reliability factors and engagement by the enemy, 3) target coverage, 4) logistics and basing, 5) auxiliary requirements such as fighters and supply systems, and 6) time phasing issues such as the distribution of available funds at specific periods among research, procurement, and operation.

To evaluate the various components of the study and especially to mathematize them, Paxson and his staff adopted a range of innovative techniques. For example, he recruited members of the Airborne Vehicles Section to prepare mathematical equations interrelating the shape, size, strength, weight, power plant equipment, and performance of aircraft with the objective of determining the characteristics of an "optimum" aircraft.[80] Preliminary work indicated that the interrelation of these variables would involve the calculation of well over 100 equations and functional relationships, and require massive computational capabilities. Also, to apply the ideas of game theory to aerial engagement, Paxson designed and had constructed the Aerial Combat

Research Room.[81] In this plotting room, Paxson and his staff simulated aerial combat maneuvers and executed mock engagements so that the geometric aspects of air battles could be quantified and used in game-theoretic calculations. To heighten the realism of the analysis, RAND invited Navy and Air Force aviators to participate in combat simulations.

By 1949, Paxson's aerial bombing study was expanding in both scope and complexity at an alarming rate but showing little promise that it would soon produce tangible results. Paxson clearly had energized RAND's research community, but with each apparent solution the researchers uncovered whole new levels of complexity and uncertainty. For example, perplexing problems had emerged with the application of game theory to aerial combat situations. Fred Kaplan recounts such an occasion when Paxson and one of his assistants, Edward S. Quade[82], spent months using mathematical models of hypothetical air duels to calculate an optimal strategy in fighter combat. When they arrived at a solution and compared it with actual data from World War II, they found that where their theory predicted a 60 percent probability of kill, real fighters achieved only two percent.[83] After two years of work, Paxson and his analysts seemed to be getting no closer to a comprehensive theory of offensive war.

In June 1949, RAND director Frank Collbohm took advantage of a specific Air Force research request to prod Paxson's team into producing something more immediately tangible. At that time, the Air Force asked RAND to recommend a preferred diameter for the TX-5 type atomic bomb and imposed a strict deadline for the reporting of conclusions. Collbohm incorporated both the Air Force's request and its reporting deadline into Paxson's strategic bombing analysis, and Paxson re-defined the problem as follows:

> Given a fixed amount of fissile material and a fixed sum of money with which to procure, operate, and maintain a strategic striking force at strength for a 4-year period, specify the atomic bombs and aircraft which will maximize the damage of an initial bombing strike.[84]

Unfortunately, as Paxson struggled to produce results on the offensive bombing side of RAND's systems analysis, the second half of RAND's effort to create a science of war—its air defense analysis—was also mired in analytical complexity. On 17 December 1946, Carl Spaatz, the commanding general of the Army Air Forces, had written a letter to Theodore von Karmen, the chairman of the AAF Scientific Advisory Board (SAB), requesting that a study be performed of the problems associated with the defense of the United States against air attack.[85] Spaatz suggested that the matter be referred to Project RAND for study, a plan to which the SAB agreed, and RAND began work on the problem in February 1947. Specifically, the AAF posed a series of ten questions, such as what kind of attack might be anticipated and what counter-weapons an enemy might use. Within several weeks, RAND staff members had prepared both an outline for a comprehensive systems analysis of air defense and a frightening preliminary response to the AAF questions. This preliminary report concluded, for example, that the United States "should expect a protracted struggle [with the Soviet Union] without war . . . [followed] by an all-out surprise attack by air, sea, sabotage, etc., employing all the weapons available."[86]

The long-term systems analysis of air defense was placed under the direction of James E. Lipp, the former Douglas Aircraft engineer who was then head of Project RAND's Rocket Vehicles Section, and began in earnest with a five-day conference on national air defense hosted by RAND in New York City in March 1947.[87] Subsequent to this conference and initial investigative research at RAND, the air defense project team prepared a preliminary report entitled "Active Defense of the United States Against Air Attack (A Preliminary Study of the Problem)."[88] In this report, RAND offered a series of preliminary conclusions concerning U.S. air defense and outlined a program for a far more comprehensive systems analysis of the problem.

While the report's proposal for further research included extensive quantitative analysis of technical factors, such as the capabilities of present and anticipated equipment and the performance of various systems of air defense, it also had a more distinct social science flavor than did the offensive bombing systems analysis. In particular, the study plan included a section on economic and social factors of the defense problem, which called for analyses of the likelihood of war, the requirements of national security, and the non-technical characteristics of a defense system.[89] In February 1948 RAND submitted this initial report to the Air Force, which approved RAND's expanded systems analysis of air defense. During the remainder of 1948 and the first three quarters of 1949, the corporation pursued at a leisurely pace a wide range of component analyses designed to provide the building blocks for a comprehensive systems analysis on air defense tentatively scheduled for completion in early 1951.

This relaxed pace was transformed into feverishness, however, when the Soviet Union detonated its first atomic bomb in August of 1949, thereby breaking the U.S. atomic monopoly.[90] Correspondence between RAND director Frank Collbohm and Lawrence Henderson, the head of RAND's Washington, D.C., Office, indicates that the detection of Soviet A-bomb tests created a panic among U.S. policy-makers concerning the sudden potential for a Soviet nuclear attack on North America.[91] For example, Henderson reported that the Air Force had immediately recommended that the number of fighter groups deployed for U.S. homeland defense be increased from six to fifty. Henderson's classified intelligence memos even reported to Collbohm considerations of pre-emptive atomic strikes against the Soviet Union "before it's too late." On 14 November 1949, Major General Gordon P. Saville, U.S.A.F. Air Defense Command Director of Requirements, visited RAND to express the heightened urgency of the air defense systems analysis due to the Soviet bomb test. According to Henderson, the Air Force had not expected Soviet atomic capability for several years, and it now expected the Red Air Force to be in a position to launch a catastrophic atomic attack on the United States by 1952. RAND eagerly accelerated its work on the air defense analysis subsequent to completion in January 1950 of the aerial bombing systems analysis. As an interim measure, RAND agreed to deliver all pertinent air defense component studies, whether completed or not, to the Air Staff for use in immediate air defense planning.[92]

By the end of 1949 the Air Force enthusiastically supported both halves of RAND's program of comprehensive national defense systems analysis: offensive bombing and defensive intercontinental warfare. In a memorandum for the corporate record, Henderson expressed the clarity with which RAND now saw its analytical objectives:

> The pertinent factors comprising aerial offensive and defensive systems must be identified, put in quantitative form, and the effect of their variation on the results established, in RAND's studies, which consider the interrelation of all these factors simultaneously. Such a systematic analysis compares alternative weapons systems to determine which is preferred, in the sense of yielding either a maximum pay-off (in terms of utility or military worth) for a given expenditure of resources, or a given pay-off for a minimum expenditure of resources. . . . Thus systems analysis seeks to cover the full range of possible future weapon characteristics and simultaneously analyze each set of possible characteristics in all possible tactics and strategies of employment.[93]

In fact, by May 1949 RAND's systems analysts had drawn up a game plan by which they might achieve the construction of a comprehensive theory of warfare.[94] This lengthy document, entitled Defense and Bombing Systems Sub-Projects, provided a chart of RAND's present

systems concept, shown in Figure 5, as well as an overview of the myriad subprojects required to execute the plan.

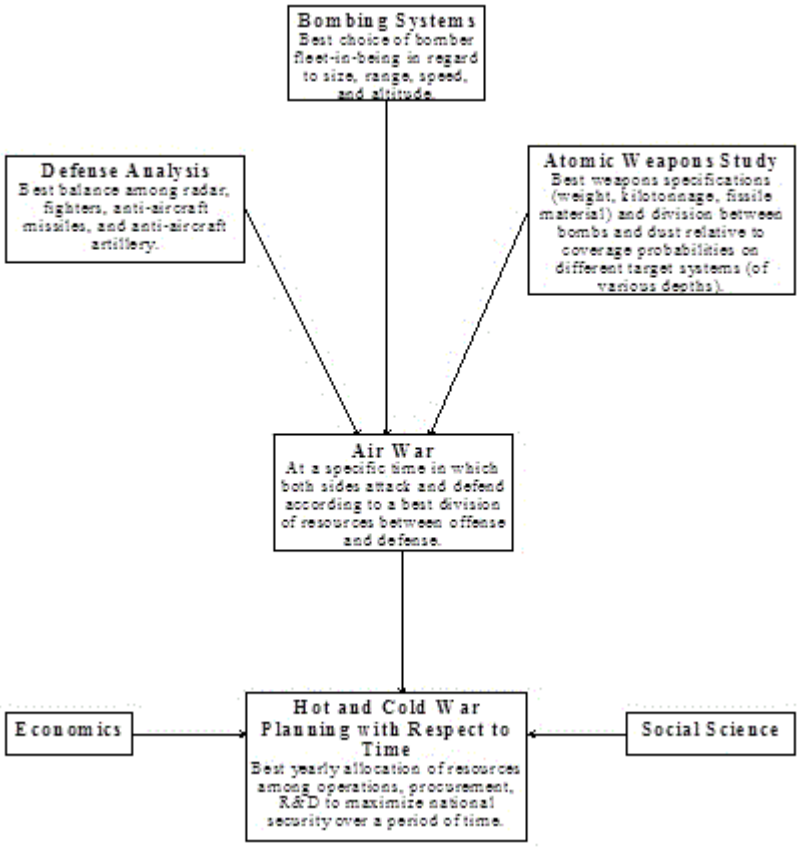


Figure 5. RAND Warfare Systems Concept, May 1949
Source: "Defense and Bombing Systems Sub-Projects," RAND Limited Document D(L)-497, May 1949, pp. 2-3.

According to this plan, RAND's offensive and defensive systems analyses would be combined with a more technically-oriented analysis of atomic weapons capabilities to yield a model of "symmetric air war." This master systems analysis would provide, for any given time within the study's horizon, the optimal allocation of resources between attack and defense and the best yearly allocation of resources among operations, procurement, research, and development to maximize national security prior to the outbreak of war. Further, economic and social science considerations would be incorporated so as to indicate the "ultimate balance of national resources."[95] RAND seemed to be on the brink of codifying a true science of war.

As with most visions of the mythical Holy Grail, however, RAND's glimpse of a science of warfare was fleeting. Spurred both by RAND's management and the near-panic engendered by the Soviet A-bomb test, Paxson's offensive bombing systems analysis team worked tirelessly to produce results before their deadline in January 1950. Applying RAND's mathematical expertise to the problem, Paxson and his staff calculated outcomes for over 400,000 bomb-bomber configurations and incorporated dozens of variables into the analysis. Optimal target selection, preferred bombing routes, expected enemy countermeasures, bomb coverage factors, and many

other inputs were considered and their interactions demonstrated. By the end of 1949, the systems analysts had produced an intellectual tour de force. Their report brimmed with elegant mathematical and economic analyses, graphs, charts, and optimization tables.[96]

Despite its methodological ingenuity, however, the report's conclusions were highly problematic. To meet the Air Force's urgent deadlines, Paxson had altered the assumptions of the aerial bombing systems analysis so as to keep the mathematical problems manageable. First, the RAND report assumed a one-strike campaign and relied most heavily on the amount of damage inflicted per number of dollars spent on the striking force as the criterion to decide between alternative schemes. These assumptions lead to a strategic outcome in which swarms of low-cost but highly vulnerable American bombers would be sent to overwhelm Russian defenses. As Lawrence Henderson admitted to William Burden, Special Assistant to the Secretary of the Air Force, "[W]e are not satisfied that the criteria we used are necessarily the best."[97] Second, the mathematical demands of the bombing analysis required that it be an entirely static analysis and ignore the problems related to the phasing out of old equipment and the phasing in of new systems. To the horror of the Air Force's top operational leadership, Paxson and the RAND analysts recommended that the service invest its shrinking budget in an offensive striking force composed of hulking turboprop bombers.

RAND's systems analysts had a particularly difficult time choosing the criteria upon which bombing system comparisons should be based. When Paxson submitted his team's initial offensive war systems analysis to the Air Force in early 1950, the report employed three different choice criteria: ratio of system cost to damage inflicted, ratio of pounds of aircraft lost to damage inflicted, and number of aircrews lost per damage inflicted. Of these, the ratio of system cost to amount of damage was the criterion upon which the primary optimizations had been based, largely since it was most easily calculated with a comfortable degree of certitude. However, Air Force critics of the Paxson study, virtually all of whom were former aircrew members, reviled RAND's apparent reduction of human life to a quantifiable factor that was given, at best, equal weighting with machinery.

A further problem with Paxson's offensive bombing systems analysis was that the RAND study assumed that U.S. bombers would operate from U.S. bases and utilize a location in Newfoundland as a staging area from which to mount attacks deep into the Soviet Union. This assumption skewed the outcome in favor of more fuel-efficient turboprops versus relatively fuel-hungry but higher-performing turbojets. Furthermore, the attack strategy assumed by RAND contrasted with the actual operational plan the Air Force had in place at the time, which was to fly its bombers to overseas bases in the event of war and launch attacks from these forward positions. Finally, one of few parameters not accounted for in Paxson's study turned out virtually to nullify the report's conclusions. In conducting their study, the RAND analysts had failed to incorporate consideration for the limited amount of fissile material available for bomb production over the upcoming years.[98] This meant, according to RAND economist Jack Hirshleifer[99], that the strategic bombing systems analysis recommended "filling the Russian skies with empty bombers of only minor usefulness."[100]

The most vigorous criticism of Paxson's systems analysis came from the Air Force's "bomber boys" – the coterie of Air Force generals who commanded America's World War II bomber forces and dominated the postwar Air Force. These generals were the high priests of air power doctrine, and their leader was RAND's former champion—General Curtis E. LeMay. With the creation of an independent U.S. Air Force in 1947, LeMay's position of Deputy Chief of Staff for Research and Development had been eliminated, and LeMay had been reassigned to Europe where he led the spectacularly successful Berlin Airlift during the summer of 1948. In October of that year, LeMay assumed command of the Air Force's Strategic Air Command (SAC)—the

nation's long-distance atomic striking force. LeMay was thus now in command of the most powerful military force in human history, and he engaged his command with maniacal zeal.

In LeMay's mind, all war was now air war, and air war consisted of using the biggest, fastest, highest flying bombers to deliver as many nuclear weapons as possible to enemy homelands. He had very little interest in alternative concepts such as that proposed by Paxson's team. In fact, LeMay's obsession at the time was with the B-36 bomber – a six-engine behemoth that dwarfed World War II bombers and could, when organized in huge squadrons, deliver what LeMay enthusiastically referred to as SAC's nuclear "Sunday punch." From LeMay's perspective, RAND's recommendation that the U.S. strategic air forces adopt a low-technology strategy ran contrary to the reasoning that had created RAND in the first place. Project RAND had been organized under the assumption that rapidly advancing military technology demanded the ongoing connection of American academic and industrial science to military needs in the postwar period. In order to remain secure, the United States would have to use most fully its scientific and technical resources and maintain technological leadership over all potential adversaries. In LeMay's view, Project RAND was a key component of the strategy of "continual preparedness," and its advocacy of low-tech military strategies based on budget constraints was utterly counterproductive. As Kaplan points out, "Air Force officers, almost all of whom were pilots, hated [Paxson's] study. . . . They wanted a bomber that would go highest, farthest, and fastest. And that obviously meant some sort of turbojet model."[101] RAND's commitment to an ideology of optimization clashed with their client's emotional attachment to the development of newer, sexier technologies and the political imperatives for the Air Force's organizational and technological aggrandizement.

RAND's choice of decision criteria clashed with one of the Air Force's fundamental organizational objectives—the pursuit of larger budgets and more power and prestige within the military establishment. Even where Paxson's systems analysis used the ratio of weapons cost to damage inflicted as its choice criterion, the study assumed a static Air Force budget level. As such, RAND conceptualized the dilemma facing the Air Force as a basic trade-off between quality and quantity, and the assumptions built into the systems analysis caused the conclusions to swing towards quantity. The Air Force, however, wanted quality *and* quantity, and it wanted systems analysis to justify the increased budget levels that would buy both. Air Force Colonel R. R. Walker's critique of the Paxson study illustrates the SAC's perspective:

> "[I]f we assume a budget sufficient to provide a force of high performance [i.e., turbojet] bombers large enough to saturate the fighter defense and provide an optimum number of aircraft per cell we will do much better in damage per aircraft lost than the RAND "best" airplane, primarily through decreased loss to fighters."[102]

In his review of Walker's comments, RAND analyst Stephen Enke pointed out that the Air Force wanted to have its cake and to eat it. He complained that Colonel Walker "wants quality and quantity in his bombers," and failed to recognize "that in a Cold War the problem is to maximize striking power with a fixed budget."[103] Enke was wrong. For Air Force leaders like LeMay, the problem was to maximize striking power by maximizing the service's budget, and if RAND's systems analyses could not help it do that, they were hardly worth several million dollars per year. For RAND's researchers, the criteria problem, sometimes referred to as the "specification problem," would remain a fundamental obstacle to the elaboration of systems analysis well into the 1950s.

By the late spring of 1950, Air Force officials from SAC and other operational commands were bombing RAND with intense criticisms of the study.[104] In an effort to repair relations with

these commands, and SAC in particular, RAND undertook a second offensive bombing systems analysis, this time under the direction of Paxson's assistant, Edward Quade. Quade's revised project narrowed the topic of consideration to a comparison of bomber types, adopted an attack plan similar to the one the Air Force actually employed, and assumed a multi-strike campaign.[105] Although the results of this second study were closer to correct from SAC's perspective, RAND's efforts to create a general science of warfare had been discredited in the eyes of many top Air Force leaders, especially the leaders of America's atomic bombing force, the Strategic Air Command.

Another immediate effect of the bombing systems analysis difficulties was the dramatic reconceptualization of the air defense systems analysis. Following RAND's delivery of the preliminary air defense report to the Air Force in early 1950, Frank Collbohm assigned direction of the comprehensive systems analysis to Edward J. Barlow.[106] In April 1950—before criticisms of Paxson's bombing study reached RAND—Barlow and his preliminary design group completed a massive plan for a two-phase air defense systems analysis that would, first, determine the best air defense system for the United States at various levels of expenditure and, second, identify and evaluate weapons system choices.[107]

The study Barlow and this group proposed was a remarkably complex analysis, even by RAND's standards. Figure 6, recreated from the study plan, presents the relationships among the fifty-four separate component projects that constituted only the first phase of the systems analysis.[108] At the heart of the air defense project was, "the construction of an analytical or mathematical framework or model, that parallels upon a conceptual basis the behavior of the physical defense system."[109] Yet, to make this mathematical model even remotely manageable, Barlow's study, like Paxson's bombing study, had to make a series of potentially dangerous assumptions. Among the seven limitations outlined by the design group were: no passive defense measures would be considered, no submarine-launched missiles would be considered, Soviet weapons capabilities were to be assumed equal to those of American forces, and the study would be restricted to a single-strike campaign.

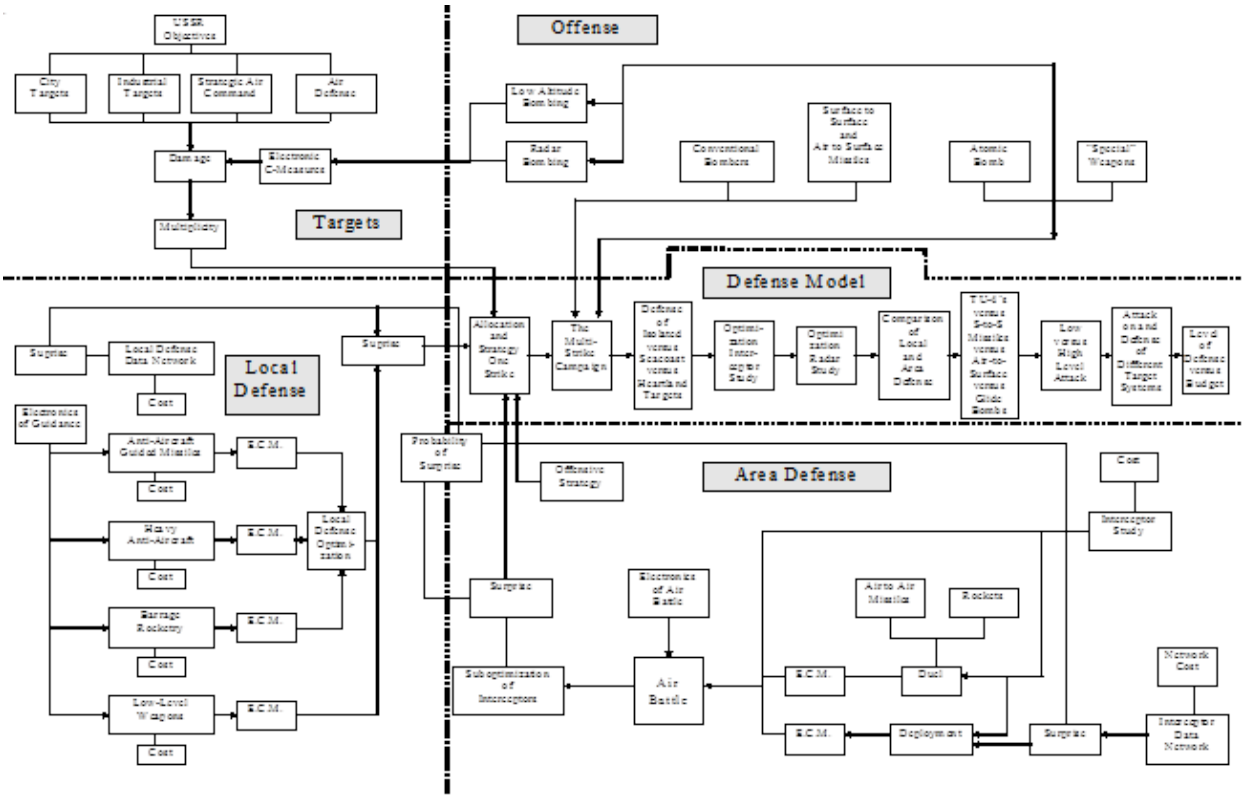


Figure 6. Air Defense Systems Analysis Project Plan, April 1950
Source: "The Air Defense of the United States, Report of the Preliminary Design Group," RAND Document D-746 (Santa Monica: RAND, 18 April 1950), figure 1.

As Air Force criticism of the strategic bombing systems analysis mounted, Barlow temporarily halted work on the air defense study. Finally, on 2 October 1950 he issued a revised plan for the air defense systems analysis that is remarkable for its frankness.[110] Whereas the original design proposal had run to well over one hundred pages of text, almost twenty pages of which were devoted to specification of the mathematical models that would be employed, the revised plan was a slim sixteen pages. Also gone from the new study was the confidence exuded by earlier RAND documents when comparing RAND's scientific methods of decision-making with those of the past. Barlow retained the conviction that in the past military planning had been handled "largely in a qualitative, intuitive way," but he went on to say, rather weakly, "It *seemed* like a good idea to attack these problems at RAND in as broad, systematic and quantitative way as possible."[111]

Furthermore, Barlow's revised proposal offered an incisive critique of systems analysis as it had been prosecuted to that date. He wrote:

> The great dangers inherent in the systems analysis approach, however, are that factors which we aren't yet in a position to treat quantitatively tend to be omitted from serious consideration. Even some factors we can be quantitative about are omitted because of limits on the complexity of structure we have learned to handle. Finally a system analysis is fairly rigid, so that we have to decide six months in advance what the USAF problem is we are trying to answer—frequently the question has changed or disappeared by the time the analysis is finished.[112]

Barlow's solution to the dilemma was,

> [T]hat a drastic change in attitude be made for the next phase of the Air Defense Study. In one sentence this new attitude is that our dominating motive be to get a correct and convincing set of recommendations on Air Defense for the USAF and that the completion of a quantitative systems analysis be secondary. Our work in the defense field should be recommendation-oriented, not methodology-oriented. . . .[113]

This said, Barlow recommended that the air defense study be cut from fifty-four to seven subprojects and that a firm, five-month deadline for the study's completion be set. Indeed, by the time Barlow's team had completed the air defense study in 1952, RAND had abandoned its efforts to construct a comprehensive science of warfare. In RAND's 1952 research review, Barlow made clear that organization's experience with the Air Defense Study dictated a shift in direction away from grand theory building towards less ambitious but more feasible studies:

> Upon completion of the Air Defense Study in 1951, it was thought that continued work in this field (by RAND) should be concentrated on selecting key component problems in which large payoffs may exist, and that no further broad systems analysis in this field should be contemplated.[114]

In reflecting upon RAND's early systems analyses and Paxson's offensive bombing systems analysis in particular, it is tempting view to them as over-ambitious intellectual adventures that were doomed to failure. Indeed, in Paxson's case, none of RAND's recommendations were implemented by the Air Force, and the study itself was subjected to the harshest criticism by top Air Force commanders. Furthermore, the execution of these early projects terminated RAND's ambitions of constructing a revolutionary science of warfare that would unite the full spectrum of academic disciplines. Still, these early systems analyses, especially Paxson's ill-starred project, were remarkably successful when taken from a different perspective—the proliferation of RAND's systems analysis techniques.

Ironically, despite the adverse reaction among operational commanders to Paxson's study, the Air Force's top leadership embraced systems analysis with considerable enthusiasm. Paxson's final report, a top secret document entitled the "Strategic Bombing System Analysis," was briefed to Air Force Chief of Staff Hoyt Vandenberg and his Air Staff team of approximately twenty officers on 9 January 1950. Vandenberg immediately commissioned an Air Staff committee to study the RAND report, including its methods and assumptions, and Paxson presented the study to this advisory group several days later. At the direction of the Air Staff, RAND presented the offensive systems analysis within the next month to Weapons Systems Evaluation Group (WSEG, the "RAND" for the Joint Chiefs of Staff), a group of two hundred representatives from the Air Force, Navy, Army, Department of Defense, Atomic Energy Commission, Bureau of the Budget, and other government officials, and at Sandia Corporation, the Armed Forces Special Weapons Project, Los Alamos National Laboratory, the AEC's Military Applications Division, and the Air Materiel Command.[115] As Collins observes, this grueling road show not only elevated RAND's visibility within the U.S. defense establishment, it "secure[d] RAND's own corporate future."[116]

Most importantly, RAND's systems analysis methodology was rapidly embraced by the Air Force's Senior Officers Board—a body formed in 1948 and composed of the Vice Chief of Staff, the Deputy Chiefs for Operations and Materiel, and the Commanding General of the Air Materiel Command. The Senior Officers Board was responsible for coordinating, at the highest level, the Air Force's strategic planning, budgeting, research and procurement activities. It was, perhaps,

the Air Staff's most powerful group. In a theme that will recur throughout the present book, the Senior Officers Board found RAND's systems analysis methods to be politically very powerful despite the dubious recommendations that the methods produced. In the first place, RAND's systems analysis provided a common analytical language that the Air Force could use to coordinate discussions involving such disparate functions as budgeting, research and operations. While not all parties agreed with RAND's findings, RAND's methods allowed all Air Force constituencies to contribute to or criticize policy deliberations. Second, the apparent scientific rigor and rationality of systems analysis lent powerful legitimacy to Air Force positions and provided that service with a decisive advantage in disputes with rival organizations—especially the Army and Navy. RAND's profound effectiveness in this regard is reflected in the fact that virtually all of the Air Force's competitors created or otherwise employed their own "RANDs" over the next decade. Third, RAND's expert systems analysis offered a means by which Air Force leaders could exercise centralized command over their vast and growing organization. Expert analysis attached to the pinnacle of Air Force management permitted the construction of centralized organization structures in which the preponderance of power would be reserved for headquarters officers. The proliferation of atomic weapons made such centralized direction and control utterly imperative as the Cold War deepened and nuclear arsenals expanded.

Back to Table of Contents

Chapter Three
The Golden Years of RAND Research, 1946-1960

We cannot do long range planning without taking fully into account intelligent estimates of strategic advances in science and technology; conversely if we expect research and technology in this country to give the greatest support to national security, we must bring leadership in these fields into our confidence, familiarizing a select group with our estimates of future military problems.

Lawrence J. Henderson, Jr.,[117]
Statement of Purposes, Objectives, and Functions of RAND, March 1947[118]

During the 1950s and 1960s, RAND's success as a research and policy organization spawned numerous competitive think tanks and inspired the creation of others, not only in defense research but also in social policy. Although RAND served as the model for such accomplished organizations as Mitre Corporation, Analytic Services, the Center for Naval Analyses, the Research Analysis Corporation, and the Urban Institute, none of its imitators can match RAND's achievements in the production and distribution of new knowledge, its impact on the entire domain of the social sciences and many areas of the "harder" sciences, and its influence in the arena of policy formulation. The reasons for these achievements surely reside with the timing of RAND's creation, the manner and context in which it was created, and the ethos of independent research that quickly developed there. Without understanding what made RAND tick, the nature of its knowledge production, and its influence not only in knowledge production but also in policy formulation, no historian can fully understand research and development in Cold War America. The present chapter provides an overview of RAND's research structure and remarkable intellectual output during the late 1940s and 1950s—years often referred to within RAND as the corporation's "golden years."

Project RAND as a Research Organization, 1946-1948

In its original organizational configuration, Project RAND included three parts: a full-time staff of researchers, a constantly evolving corps of university-based consultants; and an array of industrial sub-contractors. Project RAND's "home team"—its nucleus of employees—was drawn from a diversity of fields but largely shared the common background of extensive experience in military research. This core group initially was housed in a Douglas Aircraft facility devoted to Project RAND alone, where RAND's management and operation remained entirely autonomous from the parent company. Meanwhile, RAND's corps of consultants included a shifting mixture of individuals, usually connected with a university or another research organization (e.g., a research institute such as the Battelle Memorial Institute or a national laboratory such as Los Alamos). These affiliated scholars worked on problems for the project on a part-time basis, either at a distance or in the Santa Monica home office. Finally, the project engaged subcontractors, especially industrial firms engaged in high-technology and independent research organizations, to pursue specific technical or scientific problems and make up for RAND's lack of laboratory facilities.

To pursue a science of war, Project RAND's founders organized its home office in two parts. First, interdisciplinary working groups focused on creating a scientific methodology for analyzing warfare formed the heart of Project RAND. These groups were designed to attack the problem at

three levels: immediate problems near the tactical level, intermediate-range problems that would envisage modest modifications of existing weapons systems, and long-range problems involving analyses of anticipated scientific and technological changes and the entire war-making potential of the nation. The second part of RAND's organization—its "Sections"—provided the personnel for the systems analysis groups. Analogous to academic departments—indeed they would come to be called departments after 1948—Project RAND's sections corresponded to the fields of study that most strongly influenced modern warfare, such as rocketry, nuclear energy, electronics, and applied mathematics. These sections supported the execution of the systems analyses both by supplying manpower to the interdisciplinary groups and by performing area-specific research in support of the analyses.

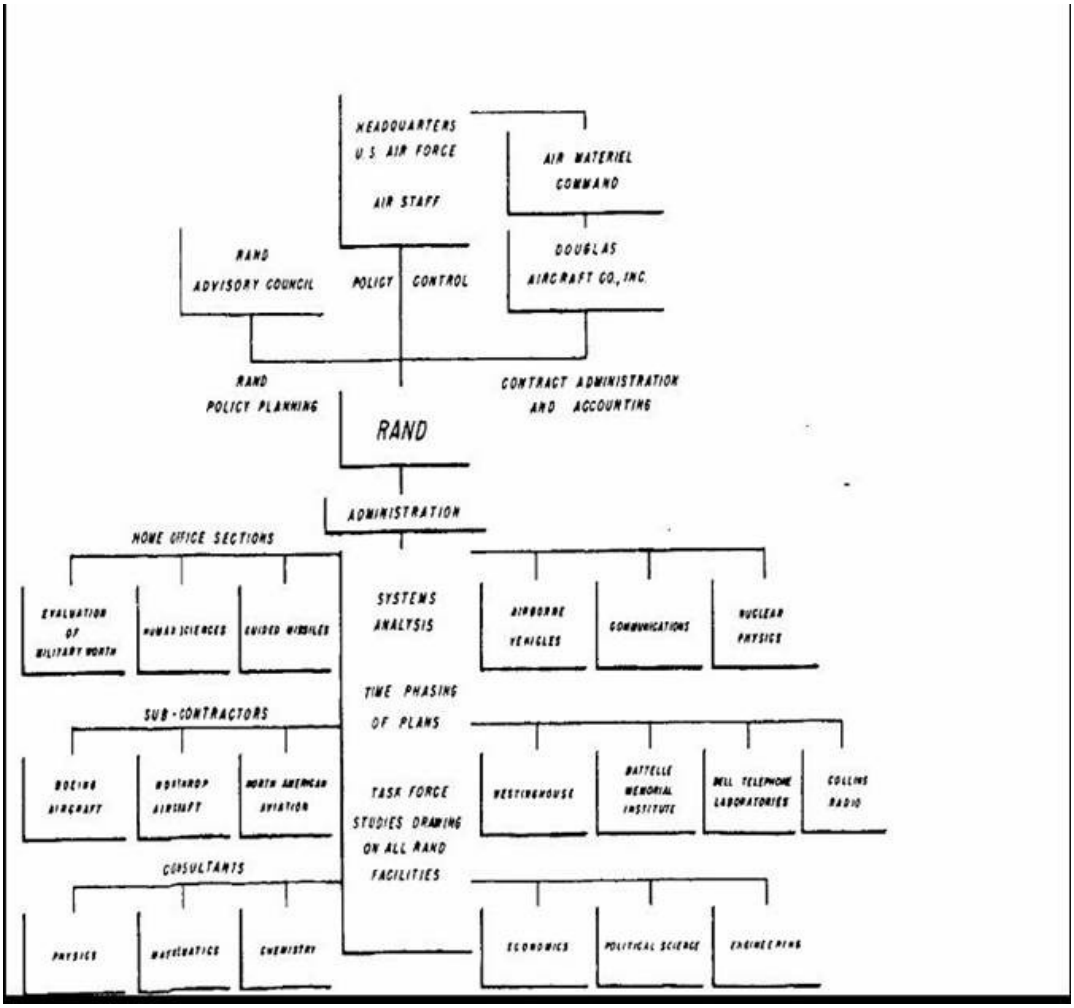


Figure 1. Project RAND Organization Chart, 1947
Source: Project RAND Second Annual Report, Project RAND Report RA-15075 (Santa Monica: Douglas Aircraft Company, 1 March 1948), p. 6.

Project RAND's initial organizational structure is illustrated in Figure 1, which depicts an unorthodox structure that placed interdisciplinary systems analyses at the center of the organization's intellectual production efforts. At the time this chart was drawn in mid-1947, RAND employed approximately 100 full-time researchers and occupied its own two-story building located at 1500 Fourth Street in Santa Monica, California.[119] As Figure 1 indicates, the

early research staff was divided into six sections—Evaluation of Military Worth, Nuclear Physics, Rocket Vehicles, Airborne Vehicles, Communications (i.e., Electronics), and Administration and Services—and while dominated by "hard" scientists and engineers, the staff had already attained a considerable degree of intellectual diversity.[120] Figure 2 illustrates this diversity by displaying the composition of RAND's research staff in 1949.

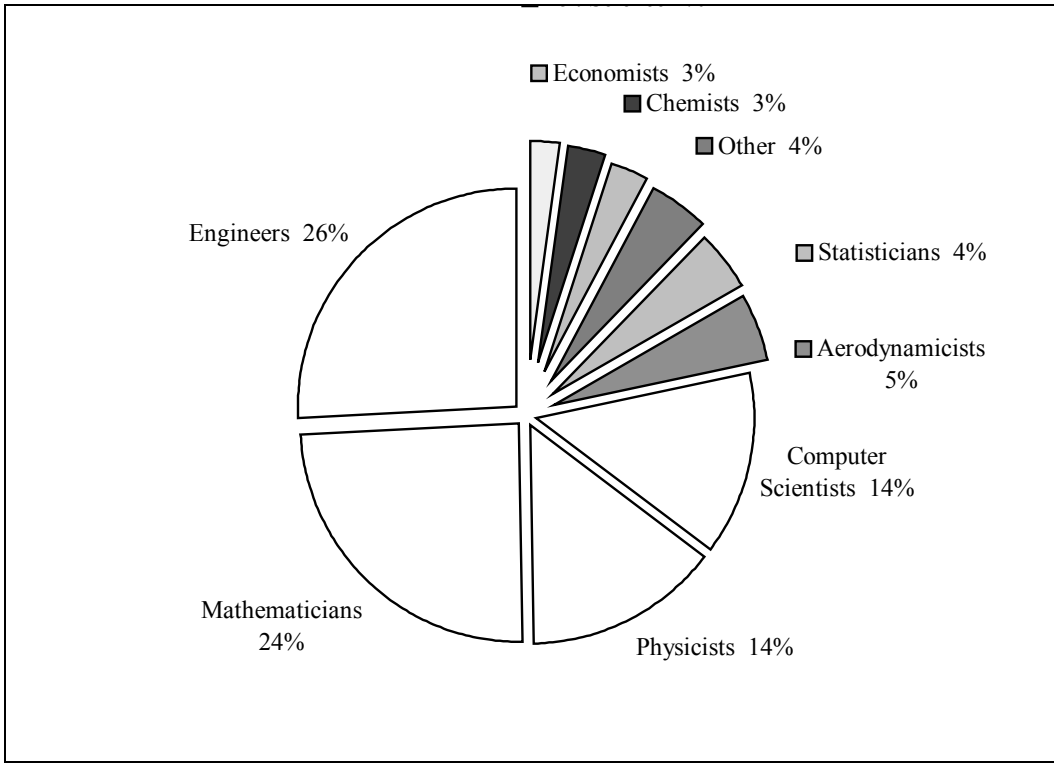


Figure 2. Composition of RAND Research Staff by Disciplines, 1949
Source: RAND Annual Report, 1949. "Other" category includes astronomers, psychologists, logicians, historians, and sociologists.

Also by mid-1947, RAND had assembled an impressive corps of consultants drawn from a wide range of disciplines. Figures 3 and 4 illustrate the disciplinary diversity of RAND's consultancy and the rapid growth of RAND's consultancy over the corporation's first ten years. RAND's consultants balanced the permanent staff's technical orientation and contributed to the research program both from their permanent situations remote from Santa Monica and during trips of varying duration to RAND's headquarters. In addition to its consultancy, Project RAND sponsored an ongoing series of conferences and summer study programs that tapped outside sources of talent, mainly in academia, for the projects' research needs. These conferences brought together academic and industrial experts on selected topics and were designed specifically to create a feeling of personal responsibility for national security among industrialists and scientists.[121]

For example, at the request of the Air Force, RAND held a conference on biological warfare in 1949 that was attended by dozens of experts from throughout the United States. The published proceedings of this conference remain classified Top Secret and are therefore inaccessible. However, RAND published internally an extensive document reporting the history and scope of

biological warfare efforts and the implications of biological warfare for civil defense, and providing a bibliography on biological warfare.[122]

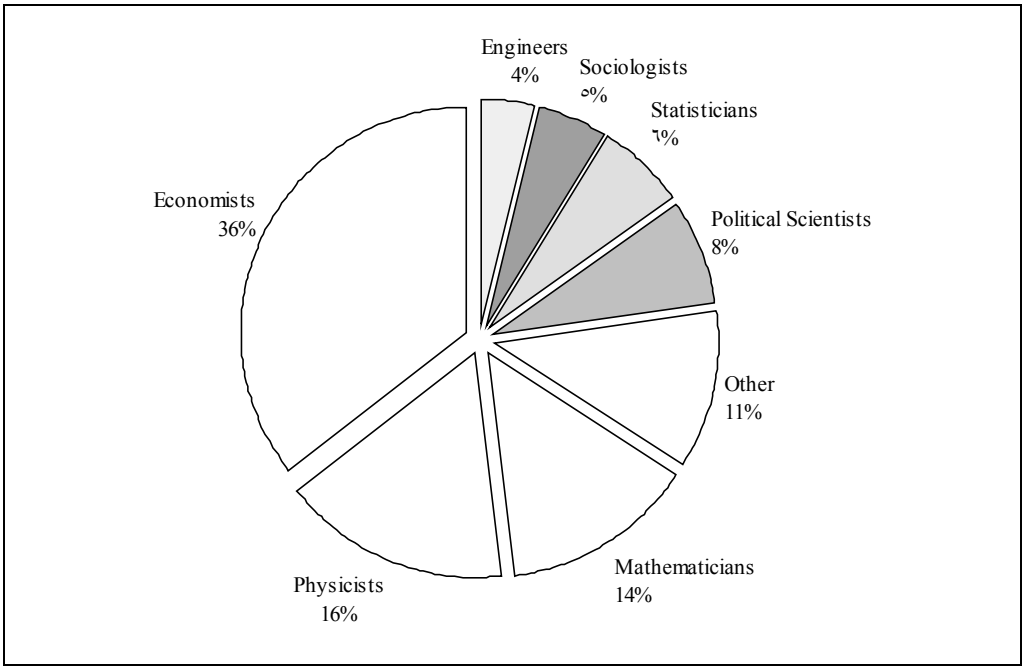


Figure 3. Disciplinary Composition of RAND's Consultant Staff, 1950
Source: RAND Corporation Annual Report, 1950.

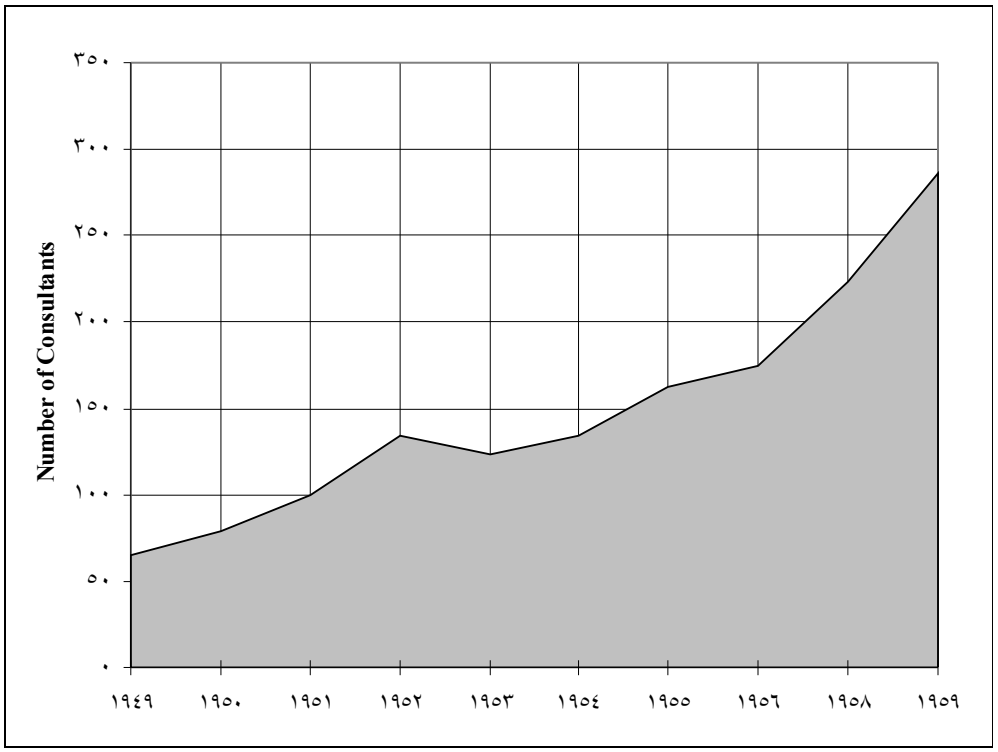


Figure 4. Growth of RAND Consulting Staff, 1949-1959
Source: RAND Corporation Annual Reports, Various Years. Data for 1957 unavailable.

Project RAND's early organization chart also illustrates the project's extensive relations with industrial subcontractors, especially with aviation firms. As of June 1947, Project RAND's largest subcontracting relationship was with the Battelle Memorial Institute, which conducted for RAND studies of materials and fuels applicable to supersonic vehicles.[123] The most significant aspects of the Battelle-RAND research relationship were the development of boron-based chemical fuels and titanium, a lightweight metal that quickly became a crucial strategic material. RAND's other subcontracting relationships in 1947 included Boeing Aircraft, Collins Radio, North American Aviation, Northrop Aircraft, and Bell Labs.

The Creation of RAND Corporation, 1948

By 1948, Project RAND included more that two hundred staff members trained in mathematics, engineering, aerodynamics, physics, chemistry, economics, psychology, and other disciplines, who engaged primarily in interdisciplinary research on such problems as how to launch and orbit an artificial satellite around the earth, the use of atomic fission for airplane propulsion, the maximizing performance of conventional aircraft, the development of titanium and other advanced materials, and damage effects of nuclear bombs. Although the project's researchers were having difficulty realizing their larger ambition of a general theory of warfare, the organization was already producing a substantial body of research. At the same time, though, Project RAND's original institutional form—an autonomous division of Douglas Aircraft Company—was becoming increasingly problematic for RAND, Douglas and the Air Force.[124] From RAND's perspective, its intimate association with Douglas severely hampered the project's relations with other aircraft producers. RAND desperately needed detailed development data from a wide range of Air Force contractors so as to construct effective systems analyses of defense problems. Douglas's competitors, however, were unwilling to share proprietary research and development information with a division of an apparent competitor. Indeed, much of Project RAND's early work concentrated on satellite feasibility and the relative performance of intercontinental bombers and missiles and thus had fundamental Air Force procurement implications. Furthermore, RAND's association with Douglas perpetuated its reputation as an industrial research organization and thus limited RAND's ability to attract and keep high quality academicians. As Bruce Smith notes, "[M]any RAND people felt that RAND would have difficulty achieving a reputation for truly objective research while it remained under Douglas sponsorship."[125]

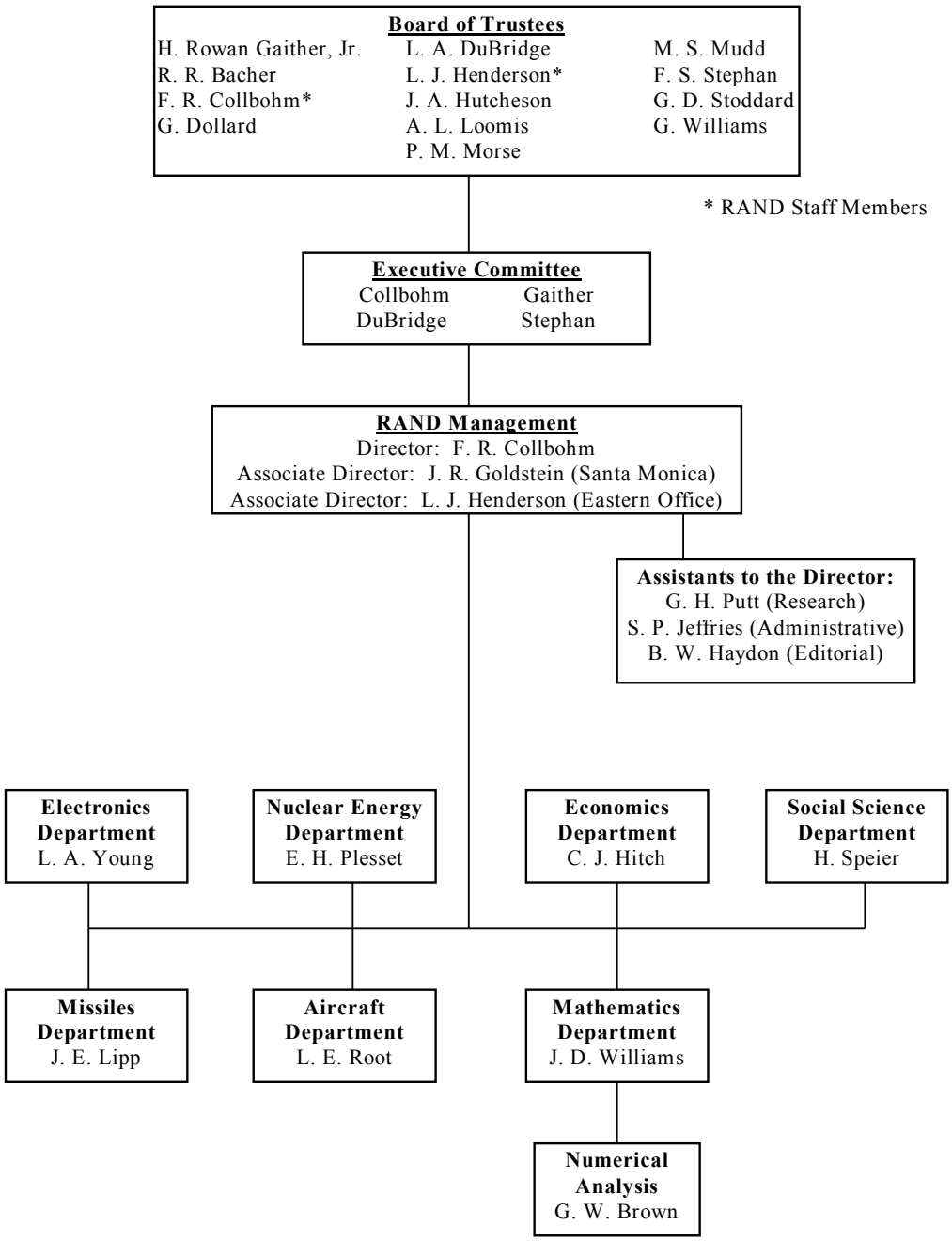


Figure 5. RAND Corporation Organization, May 1950
Source: RAND Corporation Annual Report, 1950.

From Douglas Aircraft's perspective, the company's relationship with Project RAND had grown into a liability. Douglas felt that RAND's participation in Air Force planning hurt the company's chances of securing lucrative production contracts from the military. To circumvent

apparent conflicts of interest, the Air Force went out of its way to avoid showing any favoritism to Douglas in development and procurement contracts. For example, Donald Douglas attributed his company's failure to win the C-47 aircraft contract in early 1947 at least in part to the complications introduced by Project RAND. In the depleted aircraft market of the early post-World War II years, it thus appeared to key Douglas executives that nurturing RAND might cost the parent company its life. Consequently, Douglas gave Frank Collbohm permission to explore means by which Project RAND might be separated from Douglas Aircraft in late 1947.

Collbohm immediately turned for advice to Rowan Gaither, a San Francisco attorney who had worked as an assistant director responsible for administration at the MIT Radiation Laboratory during the war. Collbohm had met Gaither at MIT, where Gaither's responsibilities brought him in touch with such influential scientists as Lee DuBridge, who became president of the California Institute of Technology in 1947, Karl Compton, MIT's president, and others throughout vast wartime military-industrial-academic complex. After the war, Gaither maintained an interest ensuring the continuation of the wartime research and development model, and by early 1947, was actively recruiting academics for Project RAND. Collbohm hired Gaither to be Project RAND's legal counsel in December 1947 with the specific task of identifying options for spinning the project out of Douglas Aircraft.

After considering options including the transfer of Project RAND to a university, Gaither recommended in early 1948 that Project RAND be established as an independent non-profit corporation. Although the execution of classified research in university settings is now commonplace, there was little or no precedent for such an approach in peacetime in 1947. Establishing RAND as a non-profit corporation avoided the perceived complexities associated with bringing large-scale military research onto an academic campus while allowing the new organization wide flexibility in its operations. With this in mind, Gaither and Collbohm began in the spring of 1948 to assemble the two prerequisites for RAND's incorporation: a credible board of trustees and adequate start-up funding. In the first regard, Gaither's extensive contacts in academia and government provided the basis for recruiting an initial board that included such luminaries as DuBridge, Charles Dollard (president, Carnegie Corporation), Philip Morse (leading wartime operations research specialist and MIT professor), Frederick Stephan (Princeton University professor of Economics and Social Institutions), George Stoddard (president, University of Illinois) and Clyde Williams (director, Battelle Memorial Institute). To secure funding for the proposed new corporation, Gaither and Collbohm turned to Gaither's father, H. Rowan Gaither, Sr., who was founder and president of Pacific National Bank in San Francisco. In May 1948, Pacific National Bank and another San Francisco banking icon, Wells Fargo Bank, agreed to provide the new corporation with a $600,000 line of credit as long as Gaither and Collbohm could secure an additional $250,000 in other working capital or other assets. For this final piece of the puzzle, Gaither turned to Karl Compton, who was a director of the Ford Foundation. Although foundations such as Ford typically were reluctant to provide working capital for beneficiary organizations, RAND's timing was perfect. The Ford Foundation had received a massive infusion of wealth upon Henry Ford's death in April 1947, and the foundation was obligated to find immediate outlets for large monetary amounts. In July 1947, Henry Ford II approved a non-interest bearing loan of $100,000 from the foundation as well as a pledge to guarantee up to $300,000 of corporate bank loans. With $1 million in funding thus secured and its credibility underwritten by a well-known board of trustees, the RAND Corporation began operations on November 1, 1948.

As RAND disengaged itself from Douglas Aircraft, the new corporation revised its strategy for attracting premium talent from both industry and academia. The recruitment of academic researchers had been slow and difficult since 1946. Once independent, RAND management

moved quickly to create an environment in which top-quality university scholars would feel at home. An observer of the RAND Corporation's organization chart in May 1950 might conclude that RAND's structure was similar to that of most universities, albeit with rather unusual department names. As Figure 5 indicates, the organization chart published by the corporation in 1950 differed dramatically from Project RAND's just two years before. Whereas in 1948 the intellectual resources of the organization were channeled unequivocally towards the systems analyses, the 1950 version conveyed a rather orthodox line and staff form with a small corporate administration overseeing eight research departments. Also, in 1948 RAND split the Military Worth Section into three separate units that more closely resembled university departments: Mathematics, Social Science, and Economics. At the same time, RAND management adopted the title of "Departments" for the organization's component units, which originally had been called "Sections" in line with the engineering tradition of the aircraft companies. This renaming helped evoke parallels with academic units, and contributed to RAND's self-depiction as a "university without students." In further reflection of RAND's adoption of university trappings, the organization's recruiting efforts and public statements emphasized staff members' freedom to pursue discipline-oriented research. Accordingly, RAND's departments gained increasing autonomy and eroded the authority of interdepartmental research program managers such as Paxson and Barlow. In this new form, RAND Corporation entered its "golden years" as a research organization.

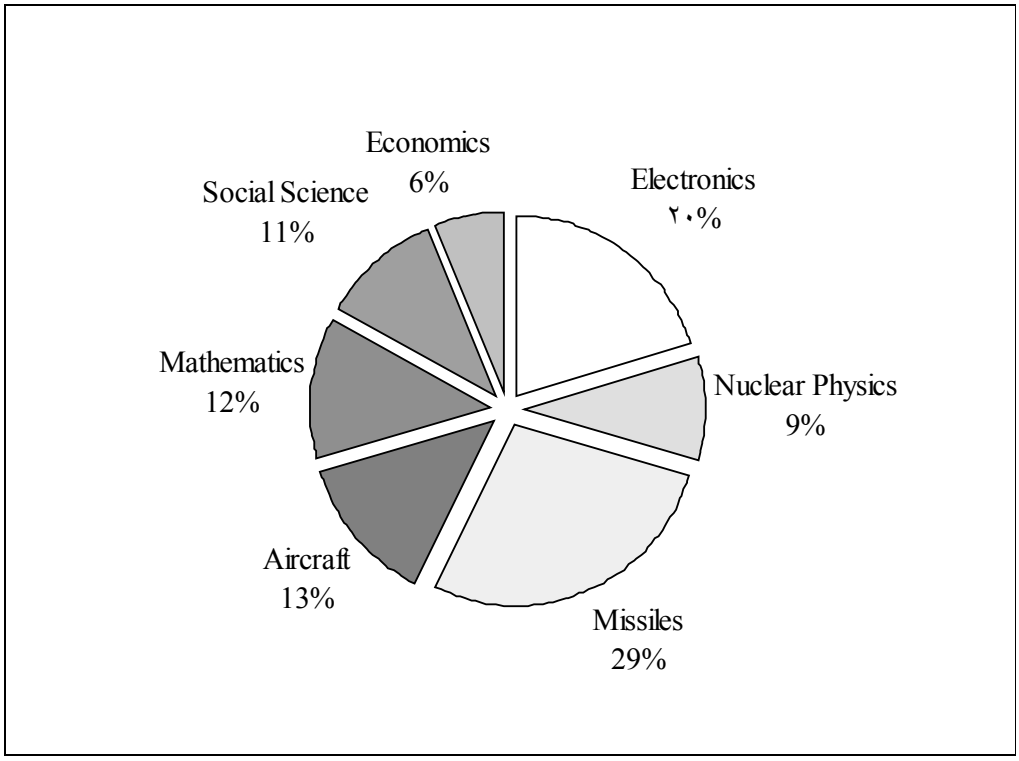


Figure 6. Departmental Division of RAND Budget, 1949
Source: "Project Budget for Period January 1-June 30, 1949," RAND Limited Document D(L)-382, 1 February 1949.

Pioneering RAND Research and Researchers

Under the organizational form adopted in 1948, RAND's researchers were affiliated with departments that had clear professional disciplinary identities. This served two purposes. First, RAND's organization into departments that mirrored academic disciplines facilitated the movement of researchers back and forth from RAND to leading universities. Second, this structure helped to keep RAND's research staff connected with their respective scholarly peer groups, therefore allowing RAND staff members to enjoy visibility outside the national security community and encouraging them to maintain high standards of research and knowledge production. To complement this departmental/disciplinary organization, however, RAND continued to organize much of its project research along interdisciplinary lines by bringing together researchers from various departments, which fostered all the creativity and tensions that distinguishes such research in a university. Thus, almost from the beginning, RAND possessed what would later be termed a "matrix organization." The balance of this chapter provides an overview of RAND's extensive research outputs during the 1950s. This discussion of RAND's knowledge production is organized into two parts: RAND's contributions to hard science and engineering and the corporation's social science research.

Hard Science and Engineering

Space Research

Not long after it was founded as an independent corporation, RAND contained seven research departments, which are shown with their respective budget allocations for 1949 in Figure 8.[126] The largest of these units, at least in the early years, was the Missiles Department, which had been organized when Project RAND was a division of Douglas Aircraft. Headed by Dr. James E. Lipp, the Missiles Department issued RAND's first formal research study, Preliminary Design of an Experimental World-Circling Space Ship.[127] Although it was produced in less than a month, the 324-page report remains one of the corporation's most widely cited projects. By assessing German and American rocket research during and prior to the war, the RAND study found that a staged rocket vehicle was the most feasible approach for putting a satellite into orbit, and that a rocket capable of putting a 500-pound payload into a 300-mile orbit could be achieved in five years at a cost of approximately $150 million ($1.7 billion in 2008).

The Army Air Force commissioned RAND's hastily prepared satellite report because it needed to avoid being outflanked by the Navy Bureau of Aeronautics, which since 1945 had been working to build on the ideas of Werner von Braun and other captured German rocket team members. In May 1946, RAND delivered to the Air Force a wide-ranging engineering study of the feasibility of designing, making, launching, and operating an artificial earth satellite which concluded that such an enterprise could be carried out with existing technology. The Air Force encouraged RAND to do additional work, which the organization delivered in a dozen reports in February 1947. These reports included not only the scientific and engineering aspects of satellite design but also cost estimates, proposed type-specifications, and a study of possible launching sites. For example, the second set of RAND studies concluded that an optimal launch vehicle would incorporate a three-stage rocket traveling at an altitude of 350 miles, employing hydrazine and liquid oxygen as propellants, having an initial gross weight of 82,000 to 86,000 pounds, and costing approximately $82 million ($945 million in 2008).[128] With regard to the satellites themselves, RAND researchers argued persuasively that the placement of orbiters would provide excellent platforms for communications relay stations and reconnaissance equipment.

These RAND studies allowed the Air Force to maintain a strong position in the Cold War pursuit of satellite technologies for communications and reconnaissance. Reconnaissance needs continued to grow as the Cold War grew more intense, and RAND produced additional studies on reconnaissance using both balloons and satellites.[129] In the case of balloon reconnaissance,

RAND analysts designed cameras and payload recovery systems that both went into operating balloon surveillance programs and provided key components of the later Corona satellite program. RAND's reconnaissance efforts reached a crescendo in 1953 and 1954 in a program known as Project FEED BACK, which involved nearly two hundred researchers. RAND's FEED BACK report laid out the characteristics of a satellite reconnaissance vehicle that employed electromagnetic transmission of data and which served as the basis for the first military satellite programs.[130] RAND's FEED BACK vehicle served as the basis for the Air Force's proposed Samos program. Samos lost out on technical grounds to the highly successful program run by the Central Intelligence Program, Corona.[131]

The Air Force triumphed with another space technology, however—the intercontinental ballistic missile (ICBM)—thanks in part to the early missile research done at RAND. RAND's Missiles Department helped to position the Air Force's R&D organization to take command of the ICBM development program in 1954. The strategic imperatives to undertake actual development of the ICBM derived from the research findings of another RAND department, Nuclear Physics. RAND's role in the research and development of ballistic missile technologies decreased during the 1950s, however, as the Air Force developed more internal R&D capabilities and chose Simon Ramo and Dean Wooldridge's new firm (Ramo-Wooldridge Corporation) to manage the actual development of the ICBM. In the 1960s, several RAND researchers, most prominent among them Ed Barlow, left RAND for other organizations when it became clear that RAND's long-term role in space development likely would be a peripheral one.

In the wake of the Soviet Union's spectacular Sputnik satellite launches in the fall of 1957, RAND played a key role in advising the Air Force, the U.S. Congress, the newly created National Aeronautics and Space Administration (NASA) and a host of national defense agencies regarding space systems. Immediately after the Sputnik launches, Congress asked RAND to produce a reference book on the state of space research to that point. In response, RAND's Robert Buchheim assembled the Space Handbook: Astronautics and Its Applications, which outlined the state of the art of space flight at that time and was published by Congress's Select Committee of Astronautics and Space Exploration.[132] RAND also provided advice to NASA as that new agency managed the nation's panicked response to the Sputnik satellites. For example, in 1959 RAND prepared a report for NASA that layed out the rationale for an American civilian space program.[133] This recently declassified report began with a list of the five objectives underpinning the U.S. non-military space effort—the first two of which expressed the fundamental connections between the American civilian space program and the Cold War:

1. To gain stature for the nation in the general struggle with world communism.
2. To contribute relevant technical knowledge and services to the national defense effort.

Aircraft

Given Project RAND's pedigree and initial situation as a division of the Douglas Aircraft Company, it may seem surprising that the project's Aircraft Department, originally called the Airborne Vehicles Section, was only its third largest research component, consuming a little over thirteen percent of total Project RAND funding during the first half of 1949. Under the leadership of Gene Root, the Aircraft Department concentrated its research on the evaluation of aircraft system configurations and methods by which bombing payloads could be delivered by winged aircraft. In early studies, the Airborne Vehicles Section concentrated on alternative configurations employing chemical- and nuclear-propelled turbojet and turboprop engines as well as more conventional reciprocating power plants. In accordance with RAND's ongoing systems analyses the Airborne Vehicles Section staff assumed as a basic problem the delivery of an atomic

payload to targets 5000 miles distant using air refueling, refueling from enroute bases, or in the absence of refueling. Working within these parameters, the aircraft research unit performed research on the performance, reliability, and cost characteristics of alternative future aircraft systems, including the optimal number and location of air bases.

Nuclear Physics

In its attention to the development of bombing systems capable of reaching targets deep within the Soviet Union without refueling, RAND's Aircraft Department worked closely with the organization's Nuclear Physics Department towards developing atomic-powered bombers capable of extreme ranges at high subsonic speeds. RAND's Nuclear Physics Department [initially the Nuclear Energy Section], which was led for its first year and a half by David T. Griggs[134] and subsequently by Ernst Plesset, made up approximately 10 percent of the corporation's research effort in 1949. Before 1950, this department was committed almost exclusively to research in the atomic propulsion of rockets and aircraft and the integration of resultant information into aircraft and missile design studies performed by RAND's Missiles and Aircraft Departments. During Project RAND's first five years, however, the Nuclear Physics Department was severely constrained in its access to atomic research data and, according to Griggs, was forced to operate in a "vacuum of information."[135]

Griggs's complaint stemmed from two developments in 1946. First, the creation of the Atomic Energy Commission (AEC) isolated Project RAND from access to vital nuclear research data, and for several years the AEC only grudgingly complied with RAND's requests for information. Second, in May 1946 the Army Air Force created Project NEPA (Nuclear Energy for the Propulsion of Aircraft) to stake its particular claim in the emerging inter-service struggle for the control of atomic development.[136] The Air Force designated NEPA as the only official channel through which its contractors could obtain the latest information on atomic research, thus posing a further barrier to RAND's access to vital research data.

Lacking internal laboratory facilities for nuclear research, RAND's management struggled to overcome the project's potentially fatal lack of access to atomic information. On one hand, RAND's Nuclear Physics Department relied heavily on input from its principal consultants, Drs. Luis Alvarez, Edwin McMillan, and Robert Serber of the University of California at Berkeley, as well as the limited amounts of data it could glean through personal connections with NEPA, various aviation firms (especially North American Aviation), the Applied Physics Laboratory at Johns Hopkins University, and the AEC. Also, the department sponsored conferences that brought together important nuclear researchers and focused their attention on the capabilities and limitations of nuclear energy for aircraft and missiles. For example, one such working session held for four weeks in August 1947 concentrated on reactor problems peculiar to aircraft and missile applications, reactor material requirements, the aero-thermodynamics of nuclear engines, the radiological health problems associated with testing and use of nuclear engines, and overall vehicle design and performance.[137]

Pressed for input to RAND's systems analysis of offensive air war and working with only the skimpiest data, the Nuclear Physics Department "had to develop from scratch an atomic engine and study its potentialities in various vehicles."[138] RAND's nuclear engine employed a reactor made of porous fissionable material that acted as a heat exchanger, transferring the heat derived from nuclear reactions to a working fluid that would be forced as a gas through the pores of the hot fissionable material. When RAND physicists incorporated this engine in rocket designs, it was referred to as the "Percolator," and when they designed it into a turbojet type of propulsion unit it was called the "Percojet." RAND's preliminary design estimates indicated that a Percolator rocket configuration consisting of a hydrogen fluid source and a gross take-off weight

of about 100,000 pounds could economically deliver an atomic warhead anywhere in the Soviet Union. Researchers believed the Percojet manned aircraft was superior to chemically-fueled airplanes for all flights of more than three hours duration or greater than 800 miles. According to Griggs,

> RAND has made a tentative appraisal of the combat utility of this vehicle as a strategic bomber. . . . It appears that such an airplane might be expected to have great combat utility for at least the next ten or fifteen years. It would derive a degree of immunity to future enemy countermeasures from its ability to attack on any course, regardless of distance traveled, and its ability to fly continuously at maximum speed at low as well as high altitudes, permitting low-level flight with evasive action over enemy territory.[139]

Griggs's memorandum failed, however, to mention the two problems associated with nuclear propulsion that, despite strenuous efforts by researchers at RAND and elsewhere, proved insurmountable. First, in the absence of massive shielding, radiation from the Percojet engine would have killed the aircraft's crew long before it reached its target. When sufficient shielding was introduced, the aircraft's weight soared to unmanageable proportions. Second, both the Percolator and Percojet nuclear engines spewed vast amounts of radioactive matter across the territories they traversed. While this was of little concern in flight over Russian territory and was indeed considered a positive side-effect in the occasion of war, it was unacceptable in flights over friendly areas. As a result, this researcher has found no evidence that RAND's nuclear engines were constructed or tested.[140]

Despite the problems with the development of RAND's Percojet, the world events of 1950 at last gave RAND's Nuclear Physics Department access to America's ultra-secret atomic brotherhood—what some have termed, "the nuclear mafia" and others "the bomb shops" of the United States. The Korean War and the Truman Administration's decision to pursue the development of the hydrogen bomb led the AEC to develop research ties with RAND's Nuclear Physics Department, and the AEC became the dominant funder of the department. This contract fundamentally altered the trajectory of RAND's Nuclear Physics Department in two ways. First, while work on nuclear propulsion continued at an ever-declining pace, its dominance of RAND's nuclear physics research agenda was replaced by a concentration on thermonuclear weapons design and phenomenology. Second, while permitting RAND physicists to participate in cutting-edge weapons research, the AEC contract also required that RAND's Nuclear Physics Department conform to stringent security requirements and, in essence, be isolated from the remainder of RAND's research community. As time passed, RAND's physicists withdrew from participation in RAND's interdisciplinary studies, and the locked glass doors between the Nuclear Physics Department and the rest of the organization became an impermeable membrane.

The RAND Nuclear Physics Department's access to the nation's atomic secrets led directly to the influential report written in early 1954 by Bruno Augenstein, "A Revised Development Program for a Ballistic Missile of Intercontinental Range."[141] Originally classified as Top Secret (declassified with deletions in April 1974), this report played an important role in the proceedings of the "Teapot Committee," which recommended that the United States proceed at once to the development of an intercontinental ballistic missile. Augenstein wrote this report before the United States had tested its hydrogen bomb, but he was privy to data suggesting that it would be more powerful—and more compact—than had originally been anticipated. With this information, Augenstein concluded that the H-bomb now made missiles an attractive alternative to bombers. The inaccuracy of missile guidance systems had previously made them relatively poor offensive

weapons, even if they carried atomic bombs. But tipped with H-bombs, Augenstein argued, ICBMs would be awesome weapons, even if they were not perfectly accurate.[142]

The Nuclear Physics Department's early research for the AEC also played a decisive role in the development of one of RAND's most famous and controversial research reports, eventually issued as Herman Kahn's On Thermonuclear War.[143] Kahn originally was a member of the Physics Department, where he gained access to much of the research being done on what was conveniently called "bomb effects"—what A-bombs and (later) H-bombs did when they exploded, how they affected various structures, environments, and organisms. These data became part of the calculus of the United States' war-making plans. Under Kahn, who brought to RAND expertise in Monte Carlo methods and also contributed to RAND's work in game theory and war simulation, the study of bomb effects became the basis for his belief that nuclear war was not only winnable but also easily survivable. Hence Kahn's strong recommendation that the nation undertake R&D on civil defense and invest heavily in the protection of civilian populations.[144] Kahn also advocated research on the regeneration of the economy and society following a nuclear holocaust, the most effective means of population regeneration, and ways to minimize and overcome genetic damage caused by high radiation exposure. Most people, in and out of RAND, found these studies highly disturbing.[145]

Electronics

According to budget allocation, RAND's Electronics Department (often referred to as the Communications Department in early documents) was the corporation's second largest research unit in 1949, absorbing about 20 percent of RAND's research funds. However, much of the actual electronics research this funding supported was performed for RAND by subcontractors such as the Collins Radio Company, RCA, and the Bell Telephone Laboratories, while the full-time electronics staff at RAND was kept at a small size. Over the first half of 1949, for example, subcontract costs made up seventy-five percent of the Electronics Department's direct expenses.[146]

Nevertheless, RAND's Electronics Department did provide crucial inputs to RAND's early systems analyses, particularly regarding warfare applications of radar, tracking, electronic countermeasures, navigation and guidance systems, and means of communication. Indeed, by 1950 the Electronics Department made several contributions to air warfare that would have long-lasting impacts on defense technology. First, following a meeting with researchers from the Battelle Memorial Institute in 1947, RAND and Battelle began a program of research into radar absorbing paints and materials that would dramatically reduce the radar cross sections produced by American bombers on enemy radar screens.[147] This program represented one of the earliest systematic explorations of what, in the 1980s, would become known as "stealth" technology. Second, the pressing needs emerging from RAND's satellite study prompted the Electronics Department to host a conference on upper atmosphere physics. This conference attracted such scholars as C. T. Elvey of the Naval Ordnance Test Station at Inyokern, D. H. Menzel of Harvard University, Lyman Spitzer of Princeton University, Calvin N. Warfield of the Applied Physics Laboratory at Johns Hopkins, and Oliver R. Wulf of the California Institute of Technology. The panel studied such issues as the free electron density, degree of ionization, and electron collision frequency found in the upper atmosphere and developed an agenda of research to be pursued through RAND and other sponsors. Finally, RAND electronics researchers, working with the organization's mathematicians, developed probability tables for the detection of targets at various distances using pulsed radar.[148] This work supported RAND's air defense systems analysis and considerably extended the potential detection horizon for U.S. early warning radar nets.

From Military Worth to Mathematics, Economics, and Social Sciences

RAND's ambition to create a general theory of "military worth" was largely an extension of the wartime work of the Applied Mathematics Panel (AMP), which operated under the Office of Scientific Research and Development.[149] Under Warren Weaver's direction, AMP had developed the concept of military worth as the key to a general science of warfare during the closing months of World War II, but it had been unable to develop the concept into a robust set of analytical tools. When Frank Collbohm hired three former members of Weaver's AMP staff—applied mathematicians John D. Williams, Olaf Helmer, and Edwin Paxson—to form the core of RAND's Evaluation of Military Worth Section, he insured that the ultimate goal of Weaver's AMP remained in place at RAND.

Williams, a larger-than-life figure in RAND's corridors due to his intellect and personality, played a critical role in shaping the Military Worth Group, and the future of RAND, by insisting on the inclusion of social scientists. According to Williams's account of RAND's early years, Frank Collbohm's initial intention was to staff Project RAND's Military Worth Section in imitation of AMP.[150] That is, the group would include mainly applied mathematicians with a handful of economists thrown in to spice things up. Williams, conversely, wanted to stock the Military Worth Section with a wide diversity of skills— "every skill under the sun," as Williams put it. To resolve this issue, RAND held a conference in July 1946 to discuss the fields of competence and particular personnel who would best contribute to the construction of a theory of military worth.[151] The conferees agreed that the RAND's Military Worth Section should be staffed with considerable disciplinary breadth, so as to integrate a wide range of knowledge into the section's research. As follow-up to the summer meetings, each of the consultants wrote a statement of his opinions regarding the structure, research agenda, and recruiting prospects for the Military Worth Section.[152]

After gaining Frank Collbohm's and the Army Air Forces's approval for a broadly defined Military Worth Section, Williams and his colleagues at RAND spent the balance of 1946 working out the specific disciplinary composition of the section. In early December, RAND held meetings during which the Military Worth Section finally took shape. Joining staff members John Williams and Olaf Helmer at these meetings was RAND consultant Warren Weaver and two other veterans from the AMP's Statistical Research Group, Princeton mathematician Samuel Wilks and his protégé and Harvard-bound statistician, Frederick Mosteller.[153] Discussion centered on how to quantify the concept of "military worth" and how to use the concept for the purposes of planning and executing a war. Wilks believed strongly in pursuing a conservative approach, which he termed "weapon-target coverage analysis." This approach demanded knowledge of weapons and their physical effects, numbers of weapons available, effectiveness of countermeasures, and the like. The further that analyses moved away from these hard data, Wilks maintained, the more uncertainty entered the picture and the greater the problem of obtaining reliable results. At the other end of the spectrum, however, RAND's Olaf Helmer advocated taking a behavioralist and contextualist approach and developing analytical methods for decision-making under conditions of uncertainty. Ultimately the group settled on something closer to Helmer's than to Wilks's approach, a decision that led to some of RAND's most outstanding research products and the emergence of some of its most distinguished researchers.

To set the stage for its expanded involvement in the social sciences, RAND sponsored a conference in New York City in September 1947 to which prominent scholars in several social science disciplines were invited.[154] According to closing plenary speaker Herbert Goldhamer, "Before this conference got under way RAND had been tentatively circling around a rather vast ocean and getting its toes wet. . . ."[155] The conference sought to acquaint experts in the social sciences with RAND and its research program, to encourage their participation in future research,

and to provide RAND with the results of informed deliberations concerning the nature and extent to which the social sciences could contribute to its program. Generally, RAND's conference organizers focused the agenda on means by which RAND and its sponsors might identify, measure, and control the factors important to the outbreak and winning of wars. The conference was divided into twelve panels, grouped into five committees: psychology and sociology, political science, economics, intelligence and military affairs, and research methods, organization, and planning.[156]

The specific topics of discussion consisted of approximately one hundred research projects submitted by the conference participants, drawn from RAND files, and "contributed unofficially by interested government agencies."[157] The conference's subject matter is illustrated by the work of a panel on the "Economics of Preparedness and War," under the chairmanship of Chicago sociologist William F. Ogburn.[158] Ogburn's panel developed the concept of two social orders, one for peace and one for war, which were composed of sharply differing parts. In moving from a social order of peace to one of war, the panel found that crucial transformations had to be made in three areas: the economic order, the democratic order, and the central government. However, the crux of the problem facing modern American society was that wars of the future would almost certainly be "total" wars and start suddenly. In the absence of sufficient time to accomplish the transition from a social order of peace to one of war, how might U.S. society intelligently be prepared for future wars? Ogburn's panel worked to develop a research agenda that would address this problem and that might be pursued by RAND.

The conference as a whole recommended that RAND conduct research in a wide variety of areas, but especially focused on psychological warfare and morale, crisis and disaster situations, American goals and values, the decision-making and social structures of the Soviet Union, civilian and military policy, American foreign policy, the economic war potential of the United States and the Soviet Union, economic conditions of international friction, economic preparedness, foreign aid, content analysis and intelligence techniques, secrecy and disclosure issues, methods of attitude measurement, the composition of research teams, and the reliability of prediction. The 1947 conference established the primary patterns of research that characterized the new Social Science and Economics Departments for several years. Furthermore, when the Military Worth Section was subdivided in 1948, the department heads for the new units (Hans Speier[159] in social science and Charles J. Hitch in economics) were recruited from the cast of conferees. Between 1946 and the early 1960s, RAND researchers in all three of the departments spawned by the Military Worth Section pioneered a variety of tools and approaches to decision-making under conditions of uncertainty.

Computing

By June 1947, the Military Worth Section had embarked on a research program concentrating on the development of mathematical techniques and computational methods appropriate to the analysis of military worth.[160] As one of their first problems, Military Worth Section researchers worked towards a mathematical solution to damage probability, commonly referred to at RAND as the "coverage problem." In essence, the task taken up was to devise computational methods that would incorporate a wide range of variables, such as aircraft performance, bomb size, weather conditions, and defensive factors, into calculations determining the number of bomb patterns needed to cover a given target with a certain degree of confidence.

Clearly, the calculation of even the most simplistic series of equations for such a model required enormous computational capabilities, and work in this field led to RAND's first efforts in the design and construction of computing equipment. For example, RAND researchers designed a mechanism which simulated the bombing of a rectangular target with rectangular patterns.[161]

The target was represented by a 64 x 64 grid of ball bearings. When a pattern was thrown onto the target with a given aiming error, it was assumed that an area equal to that pattern was destroyed and all of the ball bearings in the target grid that were covered by the bomb pattern fell through a trap door and were counted. Successive iterations of this procedure allowed the calculation of bombing probabilities and selected variable coefficients. At the same time, Military Worth Section researchers developed a random digit generator to supply the errors in range and deflection for the coverage pattern analysis. RAND staff members designed this machine for immediate use in coordination with IBM punch card equipment, but they also allowed for its integration with higher-speed electronic computers.[162]

While the coverage machine and the random digit generator provided short-term solutions to rather specific calculation problems, RAND's computation needs called for far more powerful and flexible equipment. For example, in May 1947 RAND's Ed Paxson consulted with mathematician John von Neumann concerning the computational demands of a coverage problem associated with Paxson's bombing systems analysis. Von Neumann estimated that in its present form, solution to Paxson's problem would require 50 million multiplications.[163] Regularly confronted with such prodigious computing demands, Williams sent a memorandum to project director Frank Collbohm in June 1947 that was undersigned by all of RAND's section heads and recommended that RAND obtain an EDVAC-type electronic computer at the earliest feasible date.[164] Williams's memorandum argued that while applied mathematics was a "remarkably powerful tool" for the analysis of warfare, its contributions to date had been largely theoretical. To convert the promise of theory into hard analytical results, RAND needed a state-of-the-art digital electronic computer. Williams admitted that only one such machine had, as yet been constructed—the University of Pennsylvania's ENIAC, which had been conceived in July 1943 and completed in December 1945—and that that computer was too limited in design and too remote in location to be of use to RAND.[165] However, Williams pointed out that a new class of more powerful and compact general-purpose machines, known by the generic name of EDVAC (an acronym for Electronic Discrete Variable Computer), were in the design stage and might be available for production as early as mid-1948.

With Collbohm's approval RAND pursued the acquisition of an EDVAC and was one of the first institutions in the United States to have an advanced digital computer. With the overall architecture designed by John von Neumann and construction and operation overseen by one of von Neumann's students, Willis Ware, who became RAND's foremost computer authority, RAND's computer was the first operational, core memory computer. It was named "Johnniac" in honor of its creator and important RAND consultant and remained in service at RAND from 1953 to 1966.[166]

RAND's exceptional computing resources also permitted the organization to play a crucial role in two of the key developments of the information revolution. First, during the 1960's, J. C. Shaw developed the Johnniac Open Shop System (JOSS), an early on-line time-sharing computer system that allowed multiple users throughout RAND to utilize a mainframe processor simultaneously. Second, Paul Baran's work on distributed communications—a concept now known as "packet switching—provided one of the basic communication protocols for the Internet. During the late 1950's, RAND became concerned that a Soviet nuclear attack on the United States could instantly paralyze the nation's communications network. As a solution, Baran conceptualized a "distributed backbone communications system" in which centralized, and therefore vulnerable, switches were replaced with a decentralized network of autonomous nodes. Under Baran's idea, messages travelling through the system would be broken into short segments, each of which would find its way through the network by whatever route was available. Once the information packets reached their final destination, Baran's system would reassemble them to

form the complete original message. In this way, if parts of the communication system were destroyed by Soviet attack, the network could still convey large amounts of data. Over the next few decades, Baran's ideas were incorporated in the ARPANET system, which evolved in 1989 into the Internet.[167]

Applied Mathematics

Out of the work of the Military Worth Section and in response to the limited (static) conditions in which current operations research methods could be effectively applied, George Dantzig, working as a consultant to RAND and mathematical advisor to the Air Force, made major advances in linear programming. As RAND's Military Worth Section coalesced in early 1947, Dantzig remained in his wartime position on the statistical control staff of the Army Air Forces and consulted with RAND researchers about logistical data on research and development, maintenance and basing costs, and combat losses and kills. In mid-1947, Dantzig attended a three-day symposium at RAND put together by Olaf Helmer to discuss the application of analytical techniques and computational devices to the fields of evaluation, planning, tactics, strategy, and logistics.[168] During this period Dantzig first conceptualized a particular solution for complex linear programming problems that, with the aid of electronic computers, allowed the solution of previously unaddressable problems. Dantzig's "simplex method" was laid out in a paper that remained classified until 1951.[169] By that time, RAND's computational resources and its growing program of research in logistics and transportation systems provided an optimal situation for Dantzig's work in linear programming, and he moved to RAND as a full-time researcher in 1952. While at RAND from 1952 and 1962, he wrote more than seventy Research Memoranda and Papers (two formal designations in RAND's publication system). Almost fifty of these appeared in the open literature in operations research and applied mathematics.[170]

Richard Bellman also carried out major work in applied mathematics under RAND's aegis and was probably its most distinguished mathematician. Like many RAND researchers, he entered the organization after he had spent a couple of summers working as a consultant at RAND, where he was, as he noted in his autobiography, "exposed to a number of significant mathematical ideas [such as] . . . [l]arge systems, effective numerical solutions, the application of mathematics to the social sciences, mathematical model making, the theory of games, and branching processes."[171] He found these ideas and the problems associated with them sufficiently exciting to leave a tenured faculty position at Stanford to join RAND full-time in September 1952. During his thirteen-year tenure at RAND, Bellman made enormous contributions to RAND's program in applied mathematics. His principal contribution is best captured by the broad class of methods he called "dynamic programming," which opened up further avenues in optimization (min/max, shortest path, etc.) under changing conditions (hence under conditions of uncertainty). In the period through 1962, Bellman produced some seventy-five non-classified Research Memoranda and approximately 250 "P's," the bulk of which appeared in print in the open literature.[172] In addition, he made early contributions to RAND's work in game theory.

Game Theory

From the Project RAND's outset, John von Neumann was a critical advisor to the organization and mentored several key RAND researchers. His work inspired a deep and diverse amount of research at many institutions, and RAND was no exception. To researchers in the Military Worth Section, von Neumann and Oskar Morgenstern's Theory of Games and Economic Behavior, published in 1944, appeared to offer an ideal approach to solving problems of warfare and decision-making.[173] Consequently, RAND became the leading center for the development of game theory between 1946 and 1962. By the end of 1949, for example, RAND had produced

pathbreaking work in game theoretic formulations of duels,[174] formation designs,[175] defensive tactics,[176] staggered attacks,[177] and multi-move games.[178] To spur further the development of game theory at RAND, the corporation sponsored a conference on applications of game theory to military tactics in Chicago in March 1949. These meetings were attended by a virtual Who's Who of early game theorists including Kenneth J. Arrow[179], R. L. Belzer, D. H. Blackwell, Robert Dorfman, Merrill M. Flood, Abe Girshick, L. J. Savage, and Lloyd Shapley. The conferees found game theory to be particularly applicable in three areas of defense research: long term planning and resource allocation, highly standardizable combat situations where optimal strategies could be computed and incorporated in automatic devices or handbooks, and tactical situations which were essentially unforeseeable but could be analyzed and optimized by on-site operations analysts.

In all, more than ninety individuals produced research memoranda on game theory at RAND from 1946 through 1962, as such giants as Lloyd Shapley, Melvin Dresher, J. C. C. McKinsey, Robert Belzer, Merrill Flood, L. J. Savage, John Nash, and Kenneth Arrow carried out game theory research at RAND or under RAND's aegis.[180] In 1954, John Williams, then head of the Mathematics Department, published a synthetic book on game theory, The Compleat Strategyst, Being a Primer on the Theory of Games of Strategy, which as the old-fashioned title indicates, sought to enlighten the educated reader about game theory.[181]

In the context of the Cold War, RAND's early work on game theory promised powerful results.[182] The emergence of the Soviet Union as "the enemy" and notions of a possible single, intense exchange of nuclear weapons between the Soviet Union and the United States offered a nearly perfect parallel to the simple building block of game theory—zero-sum, non-iterative, two-person games—which in turn provided the game theorists with a way to mathematize strategies and outcomes. But as real-world conditions and contingencies entered the analysis, formalizing such conditions in game theory proved to be too difficult. Non-zero-sum games consisting of multiple moves in which a changing number of players could learn, mix strategies, and pursue non-rational behavior eluded RAND researchers' formalization abilities. As Charles Hitch, head of RAND's Economics Department, noted, "For our purposes, Game Theory has been quite disappointing."[183]

Furthermore, as the 1950s proceeded RAND's military association eroded its attractiveness as a locus for unhindered scientific research, and many prominent game theorists left RAND for academia. Despite its university trappings, RAND was an integral part of the U.S. military establishment, and highly classified subject matter pervaded the corporation's research program. This limited severely scholars' opportunities to publish the results of work at RAND, and it placed RAND staff members under intense scrutiny by government security and counterintelligence agencies. Indeed, during the 1950s such organizations as the Atomic Energy Commission, the Federal Bureau of Investigation (FBI), and the U.S. Congress subjected several of RAND's most prominent scholars to terrifying loyalty investigations, causing the reseachers considerable inconvenience and, sometimes, public humiliation. Several such investigations are recalled in RAND mathematician Richard Bellman's[184] autobiography, the most painful of which was that of mathematician J.C.C. McKinsey.[185]

McKinsey was a brilliant game theorist who authored five research memoranda at RAND during the early 1950s. McKinsey was also openly homosexual, having been engaged in a monogamous relationship for almost a decade at the time of his RAND employment. During the anti-communist hearings orchestrated by Senator Joseph McCarthy, however, the Department of Defense revoked McKinsey's security clearance on grounds of "fear of blackmail and emotional instability." According to Bellman, "John Williams had the melancholy task of telling McKinsey, a fine mathematician, that he could not stay at RAND because he had lost his clearance."[186] McKinsey immediately left the corporation and took a position at Stanford University.

Richard Bellman was himself the target of protracted loyalty investigations that ended just a year before his 1965 departure from RAND. Bellman came under the scrutiny of the Atomic Energy Commission (AEC) in 1954, largely because his wife's younger brother had been a Communist Party supporter some years before. Despite Bellman's turning over to the FBI the names of communist sympathizers at Princeton, he was forced to undergo a formal loyalty hearing before an AEC panel.[187] As this investigation was underway, Bellman had to avoid contact with John von Neumann, who was then an AEC commissioner and a regular visitor at RAND, and had to recruit his colleagues to write letters substantiating his anti-communist credentials. Whereas the AEC could not prove any charges against Bellman, the case dragged on for a decade.

Among the other RAND staff members whose loyalty was investigated was Herman Kahn, later one of one of the nation's most virulent anti-communists and the founder of the Hudson Institute. Kahn was investigated by the FBI when the government discovered that Kahn's two older sisters had been communists. Richard Bellman recalled that, "the episode scarred Herman irretrievably."[188] While no communist infiltrators were unmasked at RAND, the loyalty investigations had a chilling effect on RAND's research community.[189] By the early 1960s, for example, the combination of the investigations with the troubles in applying game theory to systems analysis resulted in the departure of virtually all of RAND's key game theorists. Thus, despite the remarkable flourishing of game-theoretic research at RAND during the late 1940s and early 1950s, Hitch was correct to express considerable disappointment in such approaches to military conflict.

Economics

Almost from its creation in 1946, RAND established important ties with the Cowles Commission for Research in Economics at the University of Chicago, a pivotal institution in the rise of modern economics. Led by luminaries like Tjalling C. Koopmans and Jacob Marschak, the Cowles Commission played a major role in the mathematization of economics and the development of econometrics.[190] Many of RAND's economists had worked with the Cowles Commission and vice versa. As Nobel economist Herbert A. Simon wrote, "For centrality to the postwar quantitative social sciences, the Cowles Commission and the RAND Corporation were definitely the places to see and to be seen."[191] The association between RAND and the Cowles Commission became formalized in 1949 when RAND engaged the Cowles Commission to undertake research on the theory of resource allocation.[192] Rather than being a simple work-for-hire contract, the agreement served to bring Cowles-supported economists into RAND's national security problem domain.

The work of Nobel economist Kenneth J. Arrow provides a good example of the relationship between the two institutions. Long after finishing his formal course work in economics at Columbia but still floundering with finding a good dissertation topic, Arrow joined the Cowles Commission in 1947 as a research associate. He then spent the summer of 1948 at RAND contemplating the problems of applying game theory to Soviet-U.S. relations. Arrow describes how his work quickly evolved:

> When we were at RAND together, [Olaf] Helmer remarked that there was something that bothered him about game theory or about its applications. We wanted to talk about the US, the USSR, and Western Europe as players, but they are not like people, [so] in what sense do they have utility functions? How can we apply game theory where it is essential to have utility functions? Since when does the US have a utility function? "Oh," I said, "that is nothing. Abram Bergson has written on this type of thing." "Oh," he said, "would you write an exposition of this?" Well, that was the thing that led to the social choice book.[193]

In July 1949, Arrow, once again in Santa Monica for the summer, completed a RAND Research Memorandum entitled "Social Choice and Individual Values." This report not only fulfilled the requirement for his Columbia University dissertation in economics (the degree was awarded in 1951), but it also appeared in 1951 as a book by the same title in the Cowles Commission's monograph series with John Wiley & Sons.[194] Arrow's Nobel Prize citation singles out this book as being central to the development of modern economics.

Under the direction of the British-trained economist Charles J. Hitch, RAND's Economics Department built a powerful reputation for its work not only in game-theoretic economics and resource allocation theory but also in two other areas, program budgeting and management methods and economics of R&D. The economists who formed the Economics Department out of the breakup of the Military Worth Section rode their way to the top of RAND's reputation hierarchy by applying tried and true economic principles to military problems. They laid claim to a science that addressed the question of how best to allocate scarce resources, for example, in conducting a war or maintaining a peace.[195] Two additional factors contributed to the rise of the Economics Department. First, the Korean War and the U.S.'s forging of the North Atlantic Treaty Organization shook RAND out of its preoccupation with a nuclear exchange with the Soviet Union as the central problem facing both RAND and the United States. RAND thus took up issues of tactical air warfare and logistics systems, problems with which economists could deal using the applied mathematical methods of Dantzig, Bellman, and others. Second, RAND's abandonment of a general theory of warfare by 1952 allowed Hitch and his colleagues to pull back into more discrete and manageable problems—what Hitch termed "suboptimization" problems. Such an approach, Hitch maintained, allowed RAND to get around the "criteria problem" that had thwarted its wider, intractable systems analyses.

Hitch and his colleagues developed methods to guide choices among alternative weapons systems and among a variety of factors in other sorts of systems. These methods brought together several of the approaches being pursued at RAND—cost benefit analysis, optimization methods including linear and dynamic programming, and systems analysis. Out of this work emerged the basic text in the field, Charles J. Hitch and Roland N. McKean's The Economics of Defense in the Nuclear Age, which soon became the operation manual for the "McNamara revolution" in the Kennedy administration's Pentagon.[196] RAND's role in Robert S. McNamara's transformation of the Department of Defense is treated in detail in Chapter 5, "RAND and the McNamara Revolution."

RAND's Economics Department also pioneered in the development of the economics of R&D (or the economics of technical change). Work in this area grew out of increasing dissatisfaction with one of the fundamental premises of systems analysis—that all contingencies could be accommodated in a good systems analysis and that the method could therefore guide decisionmakers in choosing such things as future weapons systems "optimally." A second, related concern also motivated the work: concurrent engineering. During the 1950s, segments of the Air Force argued that the acquisition of future weapons systems could be so completely specified that even during the design stage, production equipment, tooling, and the like could be acquired and designed so as to save time in getting the final product actually deployed. A few economists at RAND grew increasingly skeptical about the ability of systems analysis to factor in such contingencies as scientific and technological change, and for the same reasons they objected to the premises of concurrent engineering. Consequently, encouraged by Frank Collbohm, they launched a relatively small project to carry out case studies of the weapons development process, in particular, and selected other new technologies in general. Headed by the Harvard-educated economist, Burton Klein, this group produced a number of case studies, all of which supported

the group's emerging view that R&D programs could not be efficiently managed in a strictly hierarchical, centralized organization in which procurement was pursued in parallel with R&D. The group prepared two different once-classified versions of Air Force briefings; the essence of both are fully embodied in an article by Klein, published in Fortune magazine in 1958. He addressed the widely perceived threats to the security of the United States signaled by the Soviet Union's Sputnik launches:

> Better planning, stricter control from the top, elimination of the "wasteful duplication" of interservice competition—this sums up the general belief on what we must do about military research and development if we are not to be fatally out-distanced by the Russians.
>
> The truth is precisely the reverse. The fact is that military research and development in this country is now suffering from too much direction and control. There are too many decision makers, and too many obstacles are placed in the way of getting new ideas into development. R. and D. is being crippled by the official refusal to recognize that technological progress is highly unpredictable, by the delusion that we can advance rapidly and economically by planning the future in detail.[197]

Although it maintained a tight focus on military R&D policy, RAND's economics of R&D project also yielded two of the foundational papers in the field: Richard Nelson's "The Simple Economics of Basic Scientific Research," and Kenneth J. Arrow's "Economic Welfare and the Allocation of Resources for Invention."[198] The findings in these two classic papers, however, derived more from the larger Cold War context, particularly the Sputnik crisis, in which they were written than from the empirical work being done by the group. Both Nelson's and Arrow's papers formalized the opportunistic view promulgated by the American scientific community that the reason the United States had failed to beat the Soviet Union into space was because the U.S. was not investing enough in basic scientific research.[199] Nelson's and Arrow's papers provided appealing economic theories as to why the nation would systematically underinvest in basic research. Their theories had clear policy implications: the U.S. government should invest more in basic research owing to "market failures" in the private sector. These theories have been largely internalized within the now dominant neoclassical economic tradition in spite of recent criticism from several non-orthodox economists.[200]

Soviet Studies

Although not conventionally considered a "science," Soviet studies were pursued at RAND with the same analytical rigor and toward the same ends as atomic bomb effects, advanced aircraft design, bomber base vulnerability, and the economics of R&D. The objective of RAND's diverse studies of the Soviet Union was to know the enemy and to incorporate that knowledge into the Air Force's overall strategy.[201] Also, according to a former RAND research director, RAND's work in this area, especially its research on the Soviet economy, served as a check on the intelligence estimates of the Central Intelligence Agency.[202] Two topics deserve particular mention: the Soviet economy and war-making capability, and Soviet decision-making.

RAND supported a large investigation of the Soviet economy led by some of its closest students, including Abram Bergson, Alexander Gerschenkron, and Norman M. Kaplan. Beginning in late 1948 and working in conjunction with the Air Force-funded Russian Research Center at Harvard University, RAND tried to establish accurate data on prices, wages, investment, gross domestic product, sectoral outputs, and growth rates of the Soviet Union. It proved to be a major enterprise that came to enroll many of Bergson's and Gerschenkron's

graduate students. Among the results were such fundamental works on the Soviet economy as Bergson's The Real National Income of Soviet Russia Since 1928 and Gerschenkron's Economic Backwardness in Historical Perspective. Gerschenkron and his students also produced a series of dollar indexes to Soviet output in the coal, petroleum, electricity, iron and steel, and heavy machinery industries. These indexes, which helped to establish benchmarks from which estimates of overall Soviet economic growth could be made, were produced between 1951 and 1955.[203] Research on the Soviet economy also yielded information about Soviet war-making capacity.[204]

RAND's studies of Soviet decision-making and Soviet politics, which were produced mainly by researchers in the Social Sciences Department, spurred RAND's researchers in their efforts to win the Cold War and to ensure that the United States would emerge the victor from a hot war with the Soviet Union. The Social Science Department that began formal operations in the summer of 1948 comprised two main intellectual foci, political analysis and behavioral science.[205] While the programmed research agenda for the Social Science Department identified three areas of interest, psychological warfare, civil defense, and strategic planning and intelligence, RAND had found it difficult to recruit high-quality scholars interested in international politics and relations who were willing to leave the academic environs of the East Coast. These circumstances forced the Social Science Department to establish two nearly equally sized centers of operation: one in Washington, D.C., that housed most of the individuals engaged in political analysis, and one at the Santa Monica headquarters that concentrated on matters of human behavior. The former group included such individuals as Nathan C. Leites[206], Paul Kecskemeti[207], and Bernard Brodie[208], and concentrated on studies of international relations and Soviet politics and culture.

Unquestionably, the most influential of the research products that RAND's Soviet political specialists turned out was Nathan C. Leites's The Operational Code of the Politburo, billed on its dust jacket as a "systematic analysis of the political strategy of Communism and the rules by which it operates." Born in St. Petersburg in 1912, Leites emigrated to the United States in 1936 and became a fervent anti-Bolshevik. He maintained an affiliation with the University of Chicago before World War II, worked in Washington during the war, and joined RAND in 1947, where he remained until 1962 when he took a professorship at Chicago. The Operational Code of the Politburo brought together the methods of "quantitative semantics" (Leites had written a book on it too[209]) with one of the central premises that drove so much of RAND's research, that humans, whether as individuals or as groups, make decisions based upon "rules" that can be teased out of the mind or the organization and formalized both qualitatively and quantitatively. By studying the founding documents of Bolshevism (those of Lenin and Stalin), Leites deduced a set of rules that he said governed the Soviet Union's relations with "the outside world." As Leites put the matter, "The intention is not to discuss the major theories of Leninism-Stalinism but to discover the rules which Bolsheviks believe to be necessary for effective political conduct. . . . [A] study of the sacred texts of Bolshevism—the works of Lenin and Stalin—seems necessary if we want to increase our skill in predicting Politburo behavior."[210]

The operational code deduced by Leites spanned some ninety pages under twenty headings (or chapters). The first rule under "The Calculus of the General Line," reads:

> 1. Every line of Bolshevik conduct is either prescribed or forbidden. It is prescribed if it will maximize the power of the Party. It is forbidden if it will not. There is little behavior that is merely tolerated, or recommended.[211]

The first three rules under "Advance" are:

> 1. The only way in which the Party can achieve gains is by intense "struggle."

2. The Party must take possession of every no man's land; otherwise the enemy will.
3. However 'backward' a country may be, the Party must always strive to gain control over it.[212]

To those who had read George F. Kennan's famous article in Foreign Affairs, "The Sources of Soviet Conduct" (1947), Leites's rules must have seemed familiar. But their method of formulation and the institution from which they were promulgated lent them greater credence than Kennan's unsigned article commanded. The implications of Leites's rules were frightening, and at RAND they served to inspire the institution's researchers to press on with their research and to bring any means they could to the conduct of the Cold War.[213] RAND's Assistant Director, L. J. Henderson, expressed this sense of exigency, which conditioned the research environment at RAND throughout the 1950s:

> The U.S. has for some considerable time faced an emergency in that the Soviet leaders are engaged in a determined, ruthless attempt to control the world. The recently detected atomic explosion in the USSR is in fact no more than a reminder that this state of emergency exists."[214]

Several scholars in addition to Leites brought major attention to RAND's studies of Soviet political thought. These included Herbert S. Dinerstein, whose War and the Soviet Union: Nuclear Weapons and the Revolution in Soviet Military and Political Thinking and other works earned for him a prestigious position at Johns Hopkins University's School for Advanced International Studies; Myron Rush, author of a penetrating study, The Rise of Khrushchev and later chair of Soviet Studies at Cornell University; Philip Selznick, author of The Organizational Weapon: A Study of Bolshevik Strategy and Tactics; and Robert C. Tucker, whose books on Marxist political thought and action, beginning with The Soviet Political Mind, raised him to the very height of acclaim as a distinguished professor at Princeton University.[215]

Human Behavior

Because of their physical remoteness from Santa Monica, the Washington-based Soviet specialists were limited in their active participation in RAND's interdisciplinary systems analyses. This was not so for the behavioralist portion of the Social Science staff, however. In Santa Monica, researchers such as Herbert Goldhamer and Andrew Marshall worked to have considerations of human behavior incorporated into RAND's emerging systems analysis methodology.[216] Indeed, in April 1950 Goldhamer completed a lengthy treatise arguing that RAND's systems analyses were necessarily incomplete without systematic research on human behavior.[217] He argued,

> It is clear that the real-world systems for which RAND is attempting to provide analytic counterparts are systems of organized human action, our own and those of a potential enemy. The quality and quantity of the various combinations of material resources at disposal and of the military strategies with which they are employed could only provide system solutions were one to suppose that the human effort involved in their exploitation is strictly determined by the potentialities of material and strategy, and that human action automatically and invariably realizes these potentialities. This assumption is not only not made in current RAND systems formulations, it is emphatically rejected."[218]

Up to that point, human considerations in systems analyses had been limited to notions of "degradation," which were so vague as to be useless for analytical purposes. Of particular importance, Goldhamer argued, was a deeper understanding of the man-machine relations that characterized complex modern weapons systems. Specifically, he recommended that RAND embed a research program within one of the two core systems analyses (offensive or defensive air war) that selected a particular mode of man-machine relations and explored such behavioral aspects as learning, reliability, and optimal organization.

Within months of Goldhamer's proposal, RAND took up a research program in human behavior that would lead eventually to the creation of the System Development Corporation. RAND researchers working under the direction of John L. Kennedy[219] and including Allen Newell[220] selected an Air Defense Direction Center (ADDC) as the venue for research in man-machine relations. ADDC's were the segment of the proposed national SAGE air defense network in which human operators stationed at radar screens would identify incoming aerial attacks and direct the appropriate Air Force response to those threats. To study how human-machine systems perform under stress, RAND established the Systems Research Laboratory, a facility designed to mimic precisely the operation of an ADDC but permit the execution of a variety of experimental techniques.[221] The RAND researchers conceptualized the functioning ADDC as a single organism in which "there is an assemblage of components united by some form of regular interaction or interdependence whose performance can be studied only as a unit."[222] Through the operation of the Systems Research Laboratory, the researchers scrutinized learning patterns, the performance of human operators under varying levels of stress, and the employment of various management techniques. The SRL also served as a major training ground for operators of the Air Force's SAGE air defense system, and eventually, RAND's SRL grew so big and its operation so routine that it was spun out of RAND as the System Development Corporation.[223]

Artificial Intelligence

The Systems Research Laboratory also provided the genesis of RAND's important work in what became known as "artificial intelligence."[224] In this case, however, RAND was not the lone pioneer in the field. In 1956, the Rockefeller Foundation funded the "Dartmouth Summer Research Project on Artificial Intelligence", which brought together in Hanover, New Hampshire, men who were ready "to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it."[225] The attendees of this two-month conference constitute a reasonably good proxy for the American pioneers of the field.[226] Although the conference failed to yield the epiphany hoped for by its organizers, it nevertheless served to solidify the field, fix its name as "artificial intelligence," and create a strong sense of rivalry (sometimes healthy, sometimes not) among those pioneers.[227] It also helped to turn on or enlarge a research revenue stream that would help to make four institutions into the principal loci of the first wave of AI work: M.I.T., Stanford (after John McCarthy left Dartmouth for the Palo Alto school), Stanford Research Institute (SRI), and RAND/Carnegie Tech (now Carnegie Mellon University).[228]

Herbert Simon, later the winner of a Nobel Prize in economics, his protégé Allen Newell, and J. C. Shaw, a computer scientist/programmer spearheaded the joint undertaking of RAND and Carnegie Tech in artificial intelligence. One of the founding faculty members of Carnegie Tech's Graduate School of Industrial Administration (GSIA, an institution committed to management education based on the production of new, largely quantitative social-scientific knowledge like that being developed at RAND), Simon spent several of his summers during the 1950s working at RAND on research sponsored by the Air Force.[229] During one of his trips to Santa Monica, in February 1952, Simon met Allen Newell, who was helping to develop the Systems Research

Laboratory. As Simon recalls, he and Newell established "a remarkable community of beliefs, attitudes, and values" almost instantly. Simon was deeply impressed by the computerized symbol processing capabilities Newell and J. C. "Cliff" Shaw had created at SRL, and his collaboration with them and others at RAND transformed Simon's career.[230]

According to Simon's autobiography, 1955 and 1956 were the future Nobel laureate's most important years as a scientist. During these years, Simon largely abandoned his earlier work in the fields of administration and economics and shifted his attention towards artificial intelligence. He recalls, "The completely new turn that my life took in 1955 was the unanticipated result of my work in the Systems Research Laboratory at RAND and my contact there with computers."[231] Following his intellectual transformation, the core of Simon's work became (and remains) the cognitive dimensions of human decision-making, and he and his collaborators (Newell, James March, and Richard Cyert) produced fundamental scholarship in this domain.[232] In 1955, Allen Newell moved from Santa Monica to Pittsburgh to join Simon at Carnegie Tech. However, Newell remained on RAND's payroll, holding joint positions at RAND and Carnegie Tech from then until 1961 when he join the university's faculty full-time. Both Newell and Simon remained RAND consultants for the next several decades.

Much of Simon's and Newell's early AI work concentrated on meeting an early challenge posed to American computing specialists. In 1950, Bell Telephone Laboratories researcher Claude Shannon—widely regarded as a principal founder of information theory—published two articles that challenged American scientists to develop a computer program capable of playing world-class chess.[233] By the time of the 1956 Dartmouth summer seminar, several artificial intelligence pioneers, including Simon and Newell, had taken up Shannon's challenge by writing computer programs to play chess, checkers, and other games. This work resonated at RAND because of its significance for constructing and testing theories about human intelligence and decisionmaking and building computer programming capabilities. As such, by 1956 Simon and Newell had already developed at RAND their Logical Theorist program, which could prove some elementary theorems found in Alfred N. Whitehead and Bertrand Russell's Principia Mathematica.[234] Between the Dartmouth summer seminar of 1956 and the summer of 1958, when Simon and Newell ran a seminar at RAND on computer simulation and psychology sponsored by the Ford Foundation, the RAND group had developed a chess program, which, as Simon has recently admitted, "played poor chess," but which they considered a major stride in artificial intelligence at the time. Simon, Newell, and Shaw had also made progress on a larger set of problems and by 1960 had developed the General Problem Solver, which captured in computer language their ideas about "means-ends analysis" as a heuristic of human problem solving. As the title of their program indicates, they believed their work constituted a general, if not universal, problem-solving device that captured the complexity of the human mind, which they interpreted as an information processing system.[235]

Simon and Newell's work typified the ambitious nature of RAND's research program during the 1950s, and this chapter as a whole has attempted to capture the highlights of RAND's remarkable research output during these "golden years." By 1960, RAND employed over 1,000 staff members and nearly 300 consultants, and the organization had produced more than three thousand formal reports and research memoranda (both classified and unclassified) and over six thousand internally published research documents. From its earliest days, RAND developed an organizational culture that prized intellectual curiosity and independence—an independence stemming, no doubt, from the immediate postwar environment in which scientists, engineers, and mathematicians leveraged their wartime successes to assert the wisdom of abundant, unfettered research. The image that appears again and again in RAND's self-characterizations during its first fifteen years is "a university without students." That is, the organization and its researchers were

committed to the generation of new knowledge—what Vannevar Bush had termed "basic research" in his 1945 science policy recommendations to the President, the famous report entitled Science, the Endless Frontier.[236] That frontier for RAND was of a dual character. On the one hand, there was the methodological frontier, in which RAND's researchers pioneered. On the other hand, the emerging Cold War itself constituted a frontier, for it opened up a vast set of problems and opportunities. These opportunities were not taken up lightly, however, as the tense atmosphere of the early Cold War raised the stakes of RAND's work to the highest levels. As the political confrontation between the United States and the Soviet Union deepened and intensified, RAND researchers believed that their mission was nothing short of the salvation of the human race. The more fervent RAND's researchers grew about saving the world, the more fiercely independent they became. Independence, however, is a problematic notion in a national security research institution such as RAND. Part II of this book begins with an exploration of the problems associated with RAND's independent self-identity, discussed in the next chapter, and then tracks the emergence of RAND's "golden age" of political influence during the 1960s.

Back to Table of Contents

Part 2:
RAND Reshapes Government Policy Making, 1958-1966

Chapter Four
The Trouble with Independence

On 4 October 1957, the Soviet Union placed Sputnik I, the world's first man-made satellite, into orbit around the earth and thereby opened a new era in the Cold War. Until Sputnik, the American public held a deep conviction in the technological and scientific superiority of the United States over its communist adversaries. James R. Killian,[237] President Eisenhower's Special Assistant for Science and Technology, noted that Americans received news of the Soviet technological feat with shock, and in the ensuing climate of hysteria many people "jumped to the conclusion that the Soviets had surpassed the United States in its science and technology and in its military technology."[238] The apparent challenge presented by Sputnik stimulated a massive increase in the level of federal government, and especially military, support for research and development.[239] The RAND Corporation felt the impact of Sputnik on its budget levels almost immediately. Just before the satellite's launching, the corporation's management had reported to the board of trustees that the air of austerity pervading the Department of Defense had resulted in a cutback in the Air Force's Project RAND contract allotment for fiscal 1958 from $11.6 million to $9.9 million and that the Air Force was placing all research and development contractors, including RAND, under quarterly reimbursement ceilings. Had the Air Force applied these ceilings, RAND management advised, the corporation would have been forced to finance its operations out of its corporate savings.[240] After Sputnik, however, $1.7 million was immediately added to the 1958 contract, and the estimates submitted for Project RAND for fiscal years 1959 through 1961 totaled $13.1, $14.9 and $16.3 million, respectively.[241] The flood of research funding engendered by Sputnik promised unprecedented scientific productivity at RAND.

However, the intellectual ferment achieved at RAND during the early and mid-1950s proved to be unsustainable, and the quality and productivity of RAND's research program went into decline. One reason for this was that many of RAND's intellectual leaders found the organization's secretive, national security concentration to be increasingly oppressive. During these years, RAND's relationship with its founding benefactor, the U.S. Air Force, deteriorated rapidly as Air Force leaders felt a growing need to "control RAND". This forced to the surface the problematic issue of RAND's "independence" as a research organization. To what extent could the Air Force expect RAND's allegiance in policy debates? To what extent should RAND researchers respect official Air Force positions? As the Air Force tightened its grip over RAND's research program, RAND's ability to compete with academia for top intellectual talent ebbed.

Paradoxically, decline in RAND's intellectual ferment and erosion of its Air Force relationship occurred simultaneously with considerable expansion of RAND's political influence. RAND's most ambitious analysts and researchers began to reach beyond the Air Force in their influence, especially by developing ties with the Office of the Secretary of Defense under President John Kennedy's Secretary of Defense, Robert S. McNamara.[242] Employing RAND specialists and RAND-developed organizational methods, McNamara reconstructed the Department of Defense and laid a structural foundation that persists to the present day. Furthermore, McNamara's apparent success in transforming the national security bureaucracy

provided the blueprint for organizing the emerging social welfare programs of the Great Society. By the mid-1960s, then, both current and former RAND staff members could be found across the length and breadth of the American scientific community, from academia to private industry, and from the highest reaches of the Department of Defense and its numerous laboratories and institutes, to the burgeoning federal social welfare bureaucracies. Like intellectual missionaries, these individuals carried with them RAND's ideas, techniques, and analytical methodologies.

The late 1950s and early 1960s were the Golden Age of RAND's political influence. This chapter begins with the causes and circumstances of the deterioration of RAND's relationship with the Air Force and of the corporation's shift of allegiance towards the Office of the Secretary of Defense. In particular, it focuses on developments in RAND's Economics Department where a relatively small group of practitioners, sometimes referred to as RAND's "scientific strategists," developed considerable notoriety for their analytical work in the field of nuclear weapons strategy.[243] These individuals helped catalyze both the rapid erosion of RAND-Air Force relations, which began almost coincidentally with the launching of Sputnik, and RAND's entanglement in the early 1960s struggle for control of defense policy-making that pitted Secretary of Defense McNamara and his largely civilian staff against the military services' leadership. The following chapter surveys the "McNamara Revolution" in the Department of Defense, and RAND's role in that transformation.

Independence at RAND

From the time of RAND's founding, the nature of its independence from the Air Force was problematic. Throughout the 1950s RAND was almost exclusively supported by the Air Force and thus dependent upon that service for its existence. Yet RAND had been created to attract leading technical and scholarly talent into military service without creating an environment of close military supervision and intellectual control. As Frank Collbohm and his management team shaped early RAND, they worked diligently to create a physical, cultural, and intellectual atmosphere that mimicked a university campus, albeit without students and with certain security restrictions, and allayed academicians' ingrained fears of military oversight. Indeed, the very location of RAND in Santa Monica, California, over two thousand miles from Washington, D.C., and Air Force headquarters substantiated the organization's independence. Intellectual independence became a central watchword of RAND's research culture as staff members adopted a sensitivity to academic freedom that probably exceeded that found on many Cold War-era university campuses.

Air Force leaders, however, often winked at RAND's "independence". On one hand, the 1948 Air Force policy statement on the conduct of Project RAND stated, "Project RAND represents an investment by the Air Force in objective research and analysis. To preserve this objectivity, the RAND management is given maximum freedom in planning the Project RAND research program and work schedule."[244] Yet the Air Force created RAND to further Air Force interests and the generals who supervised the world's most powerful military force held few illusions about RAND's independence. General Curtis E. LeMay, who as Air Force Deputy Chief of Staff for Research and Development played a central role in creating RAND, later claimed that the organization had been set up as a "gimmick" to attract desperately needed technical talent to the military. As LeMay recalled, "We didn't have any of the tools that then existed in Germany [following World War II], the tools necessary to conduct a program leading to intercontinental missiles and supersonic airplanes. . . . So, the gimmick was to contract with a nonprofit organization to accomplish the task, and pay their bills, and let them go out in the open market and hire the talent they needed at the going rate."[245]

As such, from the earliest days of RAND's existence, there was a disconnection between the prevalent Air Force interpretation of RAND's independence and the culture that was emerging in Santa Monica. Whereas RAND researchers considered themselves to be detached, objective scholars working on national defense problems, key senior Air Force commanders construed the relationship as more akin to a lawyer-client relationship. Bruce Smith quotes an internal Air Force study from circa 1952 as stating,

> The lawyer-client relationship of RAND to the Air Force places upon RAND certain restrictions. It is inevitable that the three departments of the National Military Establishment will compete for budgets, facilities, and military responsibilities. As a result, it is inappropriate for RAND to 'represent' more than one of these services.[246]

In general, Air Force leaders held that, although RAND would be less directly concerned with day-to-day issues than the Air Force's own "in-house" laboratories, RAND's research was still to be generally useful in pursuing the organizational objectives of the Air Force. RAND's earliest systems analysis project for the Air Force, a study of the comparative feasibility of space satellite systems, clearly suggests these goals. RAND undertook the satellite project at the request of General LeMay, who was then Deputy Chief of Air Staff for Research and Development, in the spring of 1946 when Project RAND comprised fewer than a half-dozen Douglas Aircraft Co. engineers. Just prior to LeMay's request, the Navy had proposed an interservice space program, thereby threatening to enter a field of operations that LeMay believed should be the sole operational domain of the soon-to-be-independent Air Force. Responding to LeMay's request, the RAND engineers delivered a preliminary design that showed the feasibility of satellites using current technology. Apparently impressed by this design, the Air Force asked RAND to produce plans sufficiently detailed to permit the letting of product contracts for satellite vehicles. RAND completed this work in September 1947. As Air Force documents indicate, "the Air Force request to RAND was triggered by the desire to have an independent analysis of the problem which could be presented to the Joint Research and Development Board, since this body was already preparing to review the Navy proposal."[247]

In the resulting inter-service contest, the Navy and the Air Force attacked the research problem using different strategies. While the Navy conducted a step-by-step analysis through contractors and developed a single-stage hydrogen-fueled vehicle, RAND conceptualized the problem broadly and analyzed a spectrum of alternative satellite systems. In contrast to the Navy's findings, RAND found that multiple staging was required to achieve orbital speeds with any practical technology. When the two services presented their proposals to the Joint Research and Development Board, the board instructed the Navy to terminate its program and assigned the responsibility for future satellite work to the Air Force. In retrospect, an Air Force study group concluded that "The Navy approach was task-oriented and closely specified, and it failed. The Air Force succeeded because it gave RAND a simple work statement, with maximum latitude to explore any avenues it thought might be fruitful."[248] In the long run, this experience shaped the Air Force's attitude towards RAND, which balanced permissiveness with an expectation of allegiance to Air Force needs. Affording RAND considerable latitude in its pursuit of research questions offered value to the Air Force, but its officers also perceived RAND as a member of the Air Force "team."

During the course of the 1950s, the proprietary attitude of Air Force leadership towards RAND came increasingly into conflict with the assertive independence of a remarkable cadre of RAND nuclear strategists. Following the abandonment of RAND's efforts to construct a comprehensive warfare systems analysis, the prosecution of interdisciplinary systems analyses fell

to a select group of individuals distinguished by their entrepreneurial skills and their interests in matters of broad defense policy. Although this population of entrepreneurs who pursued interdisciplinary work probably never exceeded fifteen percent of the professional staff, their impact on the organization and its development cannot be underestimated.[249] Throughout the 1950s, such individuals as Albert Wohlstetter,[250] Herman Kahn, Bernard Brodie, and William Kaufmann[251] achieved a remarkable degree of notoriety for their work in nuclear warfare strategy and came to personify the public's image of RAND.

Of particular importance were RAND's "scientific strategists"—a group of analysts, primarily members of RAND's Economics Department, who employed RAND's rigorously quantitative, rational systems analysis techniques to address complex matters of strategic defense policy. This subgroup of generalists formed mainly under the charismatic leadership of Albert Wohlstetter, a mathematical logician, included Henry S. Rowen,[252] Fred Hoffman,[253] and Alain Enthoven.[254] Whereas more traditionally-trained policy analysts such as Bernard Brodie, Andrew Marshall and William Kaufmann—mostly members of RAND's Social Sciences Division—approached strategic issues from an international relations background and employed "historico-political" methods in their work, the scientific strategists championed an engineering/social science approach to policy analysis that grew out of RAND's early systems analysis efforts. In the first place, the scientific strategists conceptualized defense policy problems as complex, systematic interactions of technological, social, political, and economic forces. Determined to accommodate rather than avoid the vast uncertainties characteristic of modern military decision-making, Wohlstetter and his group sought to identify, define and evaluate alternative courses of action in the face of imperfect information. To facilitate choice among these alternative courses of action, the style concentrated on a cold and quantitative calculus incorporating extensive exploitation of empirical data, sophisticated mathematical methodologies and model-building, war gaming, and computerized calculation. Taken together, these characteristics symbolized the "RAND style" of defense analysis.

The archetypal work of the scientific strategists was the Strategic Bases Study, which was performed by Wohlstetter with the assistance of Rowen and Hoffman during 1951-1954.[255] This systems analysis was Wohlstetter's first major project at RAND and had been conceived originally as a sub-project of RAND's offensive warfare systems study. The task taken up by Wohlstetter and his team was to identify the critical factors in strategic air base selection and to evaluate alternative basing systems according to performance in these factors. The alternative basing systems Wohlstetter evaluated were: 1) the then-programmed Strategic Air Command (SAC) basing system (as Wohlstetter, et al. understood it) which focused on the forward deployment of U.S. strategic bombers on overseas bases in the event of war, 2) bombers based on advanced overseas operating bases in time of war, 3) bombers based on intermediate overseas operating bases in wartime, 4) U.S.-based bombers operating intercontinentally with in-air refueling, and 5) U.S.-based bombers operating intercontinentally with the aid of ground refueling at overseas staging areas.

The systems analysis methods employed by the Wohlstetter group were not overly sophisticated, but they resulted in some startling conclusions.[256] Wohlstetter and his team concentrated on cost-effectiveness comparisons of the alternative basing systems, thereby seeking to employ economic efficiency as the guiding decision criterion. As such, they argued that the choice of one basing system over another "must depend on its relative cost and effectiveness rather than merely on its feasibility."[257] Specifically, the choice among basing systems involved economic trade-off among factors such as proximity to targets, favorable angles of approach to targets, logistics economy, and remoteness and comparative invulnerability to enemy attack. After exhaustive study, the Wohlstetter group concluded that the Air Force's existing strategy of

forward deployment placed the preponderance of America's nuclear striking force in considerable danger of preemptive surprise attack by the Soviet Union. In fact, they estimated that the Soviets would need only 120 atomic bombs to destroy up to 85 percent of SAC's European bomber force. They thus recommended fundamental changes in Air Force strategic doctrine and pursued their recommendations with almost missionary zeal, performing their startling presentation over ninety times for Air Force audiences.

Of crucial significance for RAND, the work of its scientific strategists brought to the surface the anomalous nature of "independence" in government- (and especially military-) sponsored research organizations. This was the case for two principal reasons: the strategic analysts' conclusions placed them in opposition to the powerful leaders of the Strategic Air Command with increasing frequency throughout the 1950s, and the subject matter of their research presented special problems with regard to publication policies. In the first case, the scientific strategists recognized that the corporation's independence from direct Air Force control, its geographical and operational remoteness from the day-to-day concerns of Washington, and the discretionary nature of its funding placed them in an exceptional position to challenge established military doctrine from the inside. They believed that the tools of systems analysis were uniquely suited for rationally and precisely informing policy issues that previously had been clouded by political and institutional biases. Taking advantage of the traditional autonomy enjoyed by RAND researchers and buttressed by their own rising professional stature, the RAND analysts increasingly explored and championed policy positions that were distasteful to influential Air Force leaders. In doing so, the analysts believed they were performing morally imperative work. Only they had the motive, methods, and opportunity to perform objective, rational analyses of crucial national security problems. Air Force leadership, however, was considerably less enthusiastic.

This was especially true among the leaders of the Strategic Air Command (SAC), which controlled the American long-range bombing forces and, through most of the 1950s, held a monopoly on the deployment of nuclear weapons in the U.S. military establishment. Although a component of the U.S. Air Force, SAC was under the direct control of the Joint Chiefs of Staff and thus held a uniquely powerful position among the armed forces. SAC's monopoly on nuclear weapons largely coincided with the adoption by the Dwight Eisenhower administration of the strategic doctrine of "massive retaliation."[258] Officially enshrined on 30 October 1953 in National Security Council Paper NSC-162/2, the strategy of massive retaliation was designed to meet the global Soviet threat without seriously weakening or undermining the American economy. Loosely translated, NSC-162/2 identified the unabashed threat of early and massive American nuclear weapons use to be the most economical counter to the perceived Soviet supremacy in conventional weapons and manpower. Rather than subject the U.S. economy to the enormous expenditures thought necessary to match Soviet conventional strengths, Eisenhower's "New Look" defense policy substituted an explicit American commitment to counter communist aggression with immediate and overwhelming nuclear strikes. An attack anywhere by communist forces would be considered, according to NSC-162/2, an attack upon the United States and would be responded to with a massive atomic strike against the Soviet Union. Clearly, this policy placed the Strategic Air Command at the pinnacle of the U.S. defense establishment.

Throughout the 1950s, however, the work of the scientific strategists at RAND consistently challenged SAC positions on nuclear strategy and, eventually, called into question such sacred notions (from SAC's perspective) as the Air Force's atomic monopoly and the utility of manned bombers. Wohlstetter's concluded, for example, that the deployment and war plans of SAC were fundamentally flawed in that, in the event of war, the Soviet Union could destroy SAC's forces by launching surprise attacks on the Air Force's overseas bases. Since the Eisenhower administration had adopted the nuclear-intensive doctrine of massive retaliation, the RAND

analysts argued, such surprise attacks would denude the United States of national defense. As such, the RAND findings were an implicit indictment of the planning capabilities of SAC's strategists, and much of the resistance to the adoption of RAND's recommendations came from SAC.

By 1958, RAND's scientific strategists were advocating specific policies, such as counterforce, limited nuclear war, limited warfare, and civil defense that were contrary to Air Force doctrine, especially SAC doctrine. Their often widely read arguments openly challenged military judgment and authority in what were traditionally matters of military policy.[259] The work of economist Alain Enthoven illustrates this trend. Enthoven had been drawn to RAND in 1956 through his association with Henry Rowen at Cambridge University, and he was one of Wohlstetter's most ambitious disciples. In 1959, Enthoven completed work on a top secret report entitled Can U.S. Strategic Air Power Survive in the 1960's?, which exposed vulnerabilities in the U.S. air defense system.[260] He argued that because the American air defense network was based on only twenty control centers, the Soviets could wipe out the system with twenty atomic weapons. Enthoven also argued that American strategic retaliatory forces remained distinctly vulnerable to Soviet surprise attack. Echoing the Strategic Bases Study of 1954, Enthoven argued that because U.S. bombers were concentrated in "soft" facilities on some forty air bases, the Soviets still could effectively disarm SAC with a surprise missile attack. As partial solutions to this state of affairs, Enthoven recommended the acceleration of the Navy's Polaris submarine-launched missile system and a "cut back on bombers and things associated with bombers."[261] The reaction of Air Force leadership to these recommendations was, at best, unfavorable.

The programs of research pursued by RAND's analysts—and particularly by the scientific strategists—brought to the surface the problems associated with RAND's intellectual independence. From RAND's perspective, the rising prominence of its policy analysts magnified the importance of the corporation's independence. Whereas independence had been a primary component of RAND's organizational culture since its formation, the premium placed by systems theory on analytical detachment and objectivity magnified the sensitivity of RAND's scientific strategists to perceived threats to that independence. In an internal memorandum from this period, RAND staff member Charles Carey articulated the importance of independence in RAND's culture:

> Freedom in the choice of problems, in analytical approach, access to data, in reporting results...plus the freedom to publish are essential for attracting and holding together a high quality research team--the life blood of RAND. For the individual such freedom is both a practical matter and a passionate religion. . . .[262]

However intensely felt by RAND staff members, this religion of independence was inconsistent with the imperatives driving Air Force leadership by 1959.

The Air Force in Relative Decline

Events during the late 1950s created powerful motives for the Air Force to bring RAND and its analysts under tighter control. Most importantly, the Air Force's pre-eminence in national security faced challenges from rival military branches and from the newly created National Aeronautics and Space Administration (NASA). Throughout the late 1940s and the 1950s, the Air Force had been the fair-haired child of the U.S. defense establishment.[263] Representing the power behind the Eisenhower administration's "New Look" defense policy, the Air Force

garnered the lion's share of budget resources, top-quality personnel, and public attention. As Bruce Smith notes, until the late 1950s, "the mission of the Air Force was almost equivalent to the whole of the national security effort. The Air Force was secure in its possession of the atomic bomb and the means of its delivery, and [it] had little reason to fear either foreign enemies or a competing sister service."[264]

This favored position, however, made the Air Force into something of a lightning rod for public criticism during the near panic over Sputnik. Critics argued that internecine rivalries both among the three military branches and within the Air Force between the "big bomber boys" and the "missile boys" had diffused U.S. space efforts and prohibited real progress on missile development.[265] In response, in mid-January 1958 Secretary of Defense Neil McElroy[266] created the Advanced Research Projects Agency (ARPA) within the Department of Defense to oversee all U.S. space programs on an interim basis. At the same time, President Eisenhower ordered the President's Scientific Advisory Committee (PSAC) to conduct a review of the nation's space efforts and recommend a long-term course of action. In late February 1958, PSAC recommended to the President the creation of a new civilian space agency that would compensate for the Soviets' leadership by creating an open, peaceful program that contrasted with Russian secrecy. President Eisenhower and his staff hesitated to sacrifice the time they felt would be required to create an entirely new space agency. In early March 1958, the Administration initiated legislation that would create a new National Aeronautics and Space Administration (NASA) by overhauling and expanding the extant National Advisory Committee on Aeronautics (NACA). Over the summer of 1958, Eisenhower's bill made its way through Congress, and on 1 October 1958, NACA underwent the metamorphosis into NASA.[267]

At the same time, Air Force efforts to prevent the Navy from penetrating its nuclear monopoly again placed RAND at the center of highly embarrassing circumstances. By 1958, the Navy was well under way with its proposed Polaris submarine-launched missile system—a weapons system that would provide the Navy with intercontinental nuclear capabilities. Seeking to find weaknesses in the Navy's system, the Air Force Chief of Staff turned to RAND for ammunition in his fight against Polaris. He requested a study of the submarine-based missile system that would, according to the Air Force's Project RAND Office, "point out some of the vulnerability aspects of the Polaris Weapon System."[268] As RAND physicist Bruno Augenstein later recalled,

> The reaction of the Air Force to this [Polaris system] was to make an urgent request of RAND to study this issue. . . . We were to study two things. One of them was to somehow demonstrate that land-based ICBMs were really the best way and the only way that one ought to go. And if one couldn't arrive at that, then to show that there were mobility ways in which the Air Force could operate ICBMs that were superior to the Navy's. This involved dropping Minutemen out of airplanes and things like that. That was the first time that I personally felt that the Air Force, our sponsor, was suddenly constraining what it was we were required to look at.
> [269]

To the Air Force's horror, the findings of RAND's analysis, reported in January 1959 in RAND Research Memorandum RM-2311, titled "Polaris Weapon System," were quite favorable to the Navy. The RAND study found Polaris to be virtually invulnerable to Soviet attack, therefore making it an exceptional second-strike weapon. Thus thwarted, the Air Force sought to suppress the RAND study so as to minimize damage to the Air Force position.[270] Unfortunately for both RAND and its sponsor, however, the Navy caught wind of the study and put Air Force leadership in an awkward position. Chief of Naval Operations Arleigh Burke[271] agreed not to

make an issue of the matter under the condition that the Navy be furnished copies of the report. After the report had been "staffed for a coordinated decision as to its releasability," copies of RM-2311 were furnished to the Navy, the Director of Guided Missiles, and the Office of the Secretary of Defense (all of which were now aware of the report's existence) on 20 February 1959. Six days later, on 26 February, RAND's T. Finley Burke, Lawrence Freedman, and Harold Brode had the unenviable task of presenting the rogue report to the Air Force Council, whose members were, by then, only too well aware of its contents.[272]

By the end of 1958 then, the Air Force faced wrenching organizational challenges with the creation of NASA, the prospective loss of its nuclear monopoly, and the passage of the Department of Defense Reorganization Act of 1958, which further centralized military authority in the civilian Office of the Secretary of Defense. Providing expert assistance that the Air Force lacked internally, RAND remained an extremely valuable source of technical and analytical advice to the service. Yet, the corporation seemed to be deviating from its proper supporting role, as the Polaris study had so painfully illustrated. Air Force leaders perceived considerable inconsistency between RAND's religion of independence and their pressing need for policy support, and they resolved to assert greater control over their sponsored organization.

The Air Force Moves to Control RAND

In 1959, the Air Force Council – the primary advisory body to the Air Force Chief of Staff – implemented two actions designed to assert greater control over RAND. During this period, the Air Force Council played a leading role in top-level policymaking for the service and was chaired by long-time chief of the Strategic Air Command, Air Force Vice Chief of Staff Curtis LeMay. First, LeMay demanded that RAND participate in a massive study of strategic offensive forces in which the Air Force would not only take an active role but would assume joint leadership. The so-called Strategic Offensive Force Study (SOFS) was initiated in January 1959 and given a strict, short deadline for results in mid-August—another deviation from normal RAND project management. For both RAND and the Air Force, the prosecution of SOFS proved highly frustrating and resulted in a palpable souring of relations. In its second action, the Air Force Council ordered the Military Advisory Group—the Air Force body that formally oversaw Project RAND—to undertake an extensive study of RAND and to recommend changes in the relationship that would increase Air Force control. This study, pursued throughout much of 1959, resulted in substantial changes in the management of Project RAND and triggered an intense reaction in Santa Monica.

The SOFS project stemmed from a series of memoranda from the Air Force Council, the Air Force Weapons Board and the U.S.A.F. Force Estimates Board, all of which pointed to the need for a comprehensive study of future Air Force force structures and weapons systems selection.[273] These memoranda indicated that such a study should incorporate all available talent from within the Air Force as well as civilian advisory agencies like RAND, ANSER, and the Institute for Air Weapons Research (IAWR). On 2 January 1959 General LeMay requested RAND's participation in the study, called the Objective Force Project, which would be performed under the general aegis of the Weapons Board and the Force Estimates Board. In response to LeMay's request, Edward J. Barlow[274], RAND's Director of Projects, participated in a preliminary meeting convened at U.S. Air Force headquarters to establish the methodology and organization for the Objective Force Project. At that meeting, LeMay placed the project under the direction of Major General Hewitt T. Wheless (Director of Plans, DCS/Plans and Programs), who organized into two primary efforts: the Air Battle Analysis Division of the Directorate of Plans, which

concentrated on simulated war gaming, and SOFS, which was to be co-managed by RAND's Barlow and an Air Force officer and supported primarily by RAND personnel.

Air Force leaders instructed that SOFS examine the objectives for American strategic offensive forces and trace the implications of these objectives as to the appropriate size, composition, and operational concepts of the strategic offensive force in the 1960s. The study's scope included both strategic vehicles and their support systems, and the Air Force demanded that RAND deliver a preliminary statement of results to the Force Estimates Board, the Weapons Board and the Air Force Council by mid-August, 1959—only seven months away. Air Force leaders further indicated that SOFS would evolve into a continuing activity in which RAND would provide directed analyses in support of recurring Air Staff actions.

The Herculean task of managing SOFS fell mainly on the shoulders of RAND engineer Edward J. Barlow, who had been appointed to the corporation's new position of Director of Projects in 1958 in an effort to revitalize interdepartmental research. Barlow had been the project director of RAND's last attempt at a comprehensive systems analysis, the air defense study of 1950-51, and his technical and management skills had earned him the respect of his RAND colleagues. Indeed, his capabilities in complex project management would qualify him subsequently to assume the general supervision of NASA's Mercury program in the early 1960s. Nevertheless, the task presented to him with SOFS was probably impossible.

SOFS was easily the largest study ever undertaken at RAND and its scope and complexity were reminiscent of RAND's early systems analysis efforts. According to Barlow's report on the project to RAND management,

> RAND participation in the SOF study was corporation-wide. Almost all of the RAND subprojects were interdisciplinary and interdivisional in nature, and a great deal of effort and organization was devoted to the coordination and intercoordination of the various subprojects. Well over 120 RAND research personnel—among them economists, engineers, mathematicians, physicists,and social and political scientists—contributed to the over-all SOFS effort.[275]

Indeed, the SOFS research effort executed under Barlow's direction included sixteen primary studies covering virtually every aspect of strategic force design and active and passive defense supported by an additional eighteen subprojects that analyzed U.S. weapons system characteristics and base designs.[276] Barlow assigned each of these component studies to a project leader who, in turn, recruited researchers from RAND's research departments using Barlow's authority when necessary. Barlow assigned to himself the direction of the Study Design and Synthesis Project, the task of which would be to integrate the innumerable papers and reports produced by the component study groups.

At the core of SOFS was the Strategic Objectives Committee, which brought together RAND's many strategic thinkers, including Wohlstetter's coterie of scientific strategists. The membership of the Strategic Objectives Committee was a roster of American strategic thinkers during the Cold War and included Bernard Brodie, Robert Buchheim, Harvey DeWeerd, Alexander George, Herbert Goldhamer, Malcolm Hoag, Fred Hoffman, Herman Kahn, William Kaufmann, Nathan Leites, Andrew Marshall, Henry Rowen, Frederick Sallagar, Thomas Schelling[277], and Albert Wohlstetter.[278] While such a remarkable assemblage of intellectual horsepower would seem to have promised excellent results, by 1959 RAND's strategic thinkers were deeply riven by philosophical differences as well as personal rivalries. These aspects were brought painfully to light as the Strategic Objectives Committee struggled to produce guiding strategic principles for the SOFS effort, but its meetings quickly devolved into bitter and

inconclusive debates. Indeed, the onset of disintegration in RAND's "golden age" strategic analysis community coincides with the Strategic Objectives Committee meetings of 1959.

Exercising the full force of his considerable management skills, Barlow coerced and cajoled the SOFS project leaders into completing the various component studies, and with a handful of assistants achieving the nearly impossible task set out by the Air Force. By mid-August 1959—before the Air Force reporting deadline—they produced an extensive briefing document that synthesized and integrated the 222 RAND papers and reports that had been completed in support of SOFS. Understandably, Barlow later remarked of the project, "When I finished that study, and certainly looking back on it again, I certainly thought that RAND should not do that kind of study."[279] In particular, Barlow recognized that SOFS represented a dangerous increase in the level of direct Air Force involvement in RAND's research activities. Over the course of the study, dozens of Air Force officers descended on RAND. As Bruce Smith notes, "Many RAND people felt the organization was being invaded by the military."[280] Barlow recalled,

> [SOFS] was a very formal joint study with very specific representation from [the Strategic Air Command]. . . . We had a liaison colonel . . . [who] was very clearly the spokesman for SAC party-line, period, and reporting back and he could only give the Air Force party-line. . . . All we got was, 'This is the Air Force party-line and if you say something different, the study's wrong."[281]

Despite the overt Air Force efforts to control SOFS, Barlow and his staff members vigorously defended the objectiveness of their analyses, and the SOFS recommendations that RAND forwarded to General LeMay and the Air Force leadership did considerable violence to official Air Force positions on a number of prominent issues. Among their recommendations, the RAND team argued in favor of an expanded ICBM program, including expansion of submarine-launched capabilities and development of a high payload "Mightyman" missile system, increased investment in passive defense systems, especially a hardening program for B-52 basing locations, and train-mobile ICBMs.[282]

Of particular exasperation to Air Force leaders, however, the SOFS briefing questioned the future effectiveness of manned bombers. As Gustave H. Shubert,[283] Barlow's assistant in the direction of SOFS, remembered, "The project was concluded . . . with a masterful briefing that contradicted many of the Air Force's cherished beliefs and drove a great big nail in the coffin of its favorite toy of the moment, the B-70, on mission capability and cost-effectiveness grounds."[284] The B-70 manned bomber program was a particular favorite of LeMay's, and when the Air Force Council met on 17 September 1959 to discuss the preliminary SOFS report, the Air Force's top brass "didn't like it one damned bit."[285] Indeed, the Air Force immediately suppressed the SOFS briefing. According to Barlow's report to RAND management, "distribution of the written equivalent [of the SOFS briefing and supporting documents] has been controlled entirely by Headquarters USAF. This is the sole instance in which the reporting of RAND research has been so controlled."[286]

From RAND's perspective, the outcome of SOFS was equally problematic. Bruce Smith notes that, "The ubiquitous presence of the military, the pressure of the deadline, and the massive and unwieldy size of the project all combined to bog the effort down in a maze of confusion and frustration. . . . No [published] final report was ever issued from the study, and a number of RAND researchers reportedly resigned in direct consequence of resentments generated in the course of the effort."[287] Exhausted by the SOFS effort and profoundly disillusioned by his experiences with the Strategic Objectives Committee, Barlow never conducted another study at RAND, and in September 1960 the Director of Projects resigned from the corporation.

The Air Force Council's second initiative to assert greater control over RAND was a detailed review of Project RAND, which also was undertaken in early 1959. Under Curtis LeMay's leadership, the Air Force Council instructed the Military Advisory Group (the Air Force body established in 1952 to oversee the service's relationship with RAND[288]) to conduct a detailed study to ensure that "effective controls be established over RAND studies financed with U.S.A.F. funds."[289] MAG's worked quickly, and the Council was able to convey its findings to the Chief of Staff on 17 July 1959.[290]

Focusing on the work of the scientific strategists, the MAG report criticized the amount of "software" or defense policy research being conducted at RAND and concluded that such research "should be closely monitored to assure that only a reasonable level of effort is expended."[291] Furthermore, the Air Force Council recommended that "existing procedures be modified to improve control and to provide a basis for the renegotiation of a new Project RAND contract." These modifications included the assignment of additional Air Force officers to RAND, the more thorough screening and increased control over RAND research, the direct review by the Air Force Council of major RAND studies, and the monitoring of RAND's work for outside agencies and RAND studies intended for non-Air Force dissemination. Also, the Air Force Council recommended that the Military Advisory Group be restructured so that its membership would include greater input from technical areas of the service, incorporate Air Force Chief of Staff representation, and present a coordinated RAND research program for Air Force Council review after all MAG meetings.[292]

Within a year of the Air Force Council's report to the Chief of Staff, fundamental changes had been instituted in the Air Force's management of Project RAND.[293] First, the format of the semi-annual meetings between MAG and RAND was altered so as to provide MAG with greater control over the topics discussed. Under the previously existing format, RAND largely ran the show and presented completed research results. This system was replaced by a "seminar" format in which Air Force MAG members engaged in discussion/interrogation of RAND researchers on prearranged topics.[294] Second, the Air Force instituted systematic evaluation of RAND research by the service's diverse segments.[295] By the end of 1959, for example, the Project RAND Office reported that comments from the Air Staff and various commands had been received on sixteen reports and on five separate compilations or groupings of RAND studies (such as military research and development management, Soviet strategic ideas, and intelligent machine research). In addition, seventeen RAND documents had been "advertised" in the Daily Staff Digest, and all feedback thus obtained had been provided verbatim to RAND management for their guidance. Third, service officials rewrote Air Force Regulation 20-9, "Air Force Policy for the Conduct of Project RAND," so as to centralize authority over Project RAND under the supervision of the Director of Development Planning, DCS/Development. Finally, the Air Force altered MAG membership so as to increase the "hardware" flavor of Air Force guidance to RAND. To do this, two members of the group were dropped (the Assistant Chief of Staff, Intelligence, and the Director of Operations, DCS/O) and three were added: the Assistant for Advanced Technology, DCS/D, the Director of Communications-Electronics, DCS/O, and the Assistant Chief of Staff, Guided Missiles. In addition to these steps, the Air Force instituted close monitoring of RAND publication practices which, LeMay remarked, "does entail the morale effects of censorship on the RAND professionals."[296]

After the disturbing conclusion of the SOFS project and to encourage RAND's submission to greater control, the Air Force quietly cut RAND's budget for the upcoming fiscal year in half to $7 million in the initial round of budget preparation.[297] Although this cut was quickly restored before the Department of Defense budget was presented to the Congress, its potentially disastrous

consequences for RAND sent a chilling message to the corporation's management – conform or else.

The Reaction at RAND: The Strategists' End Run

Through its contacts in the Project RAND Office and elsewhere in the Air Force, RAND's management appears to have been aware throughout 1959 of the military's intended assertion of greater control over the corporation's research program.[298] To examine the implications of the Air Force policy changes, RAND management asked consultant Charles E. Lindblom, in the summer of 1959, to conduct an extensive inquiry into RAND-Air Force relations. The result of this project—six papers submitted to RAND's management on 16 December 1959—expressed the growing recognition among RAND staffers that the corporation's relations with the Air Force were undergoing profound change. In the first of his papers, Lindblom laid out thirteen trends in RAND's development he had assayed.[299]

Two of these "Trends in RAND" lay at the heart of the emerging tensions between the corporation and the Air Force: RAND's declining independence and the growing ambition of an important minority of RAND's systems analysts.[300] The first of these trends, Lindblom argued, was evidenced by the Air Force's tightening control of RAND's research agenda—a process that had taken a leap forward with the SOFS engagement. The second trend, however, was more subtle. Lindblom pointed out that many RAND researchers felt American national security to be in greater peril during the late 1950s than ever before. This was especially true among RAND's scientific strategists. The Wohlstetter group, for example, continued to concentrate on the perceived vulnerability of American strategic forces to surprise Soviet attacks. Furthermore, these researchers believed that their analytical results were failing to have sufficient impact on Air Force policies. Rather than resigning themselves to these circumstances, however, key RAND staff members like Wohlstetter, Henry Rowen, Alain Enthoven, and a newly recruited Harvard student named Daniel Ellsberg[301] aggressively pursued access to broader policy influence. This desire for expanded influence was, according to Lindblom, "evidenced not only by the frequency of intense expressions of frustrations but by the decision to enter into contracts with ARPA, NASA, and still other agencies or departments of government so that RAND studies can be brought to bear at a number of points in national defense policy making."[302]

As the Air Force implemented its more rigorous policies concerning Project RAND during late 1959 and 1960, RAND's management struggled to formulate an appropriate response.[303] On the one hand, they could not afford to act harshly in suppressing the ambitions of the scientific strategists. Individuals such as Albert Wohlstetter and Herman Kahn wielded considerable respect and influence, and any indication that RAND's independence would be surrendered to the Air Force invited a hemorrhage of key talent from the organization. In a sixty-nine page essay written in February 1960, Wohlstetter broadcast the sentiments of RAND's scientific strategists that increased Air Force control of RAND presented a "crisis" for the corporation.[304] Wohlstetter's paper argued that "the premise of RAND's independence is that the harder course is both professionally more creditable and likely to be more useful in the long run to the client's interest, as distinct from his prejudices."[305] In RAND's Management Committee meetings, the organization's division heads, particularly Charles Hitch (Economics) and L. B. Rumph (Engineering) who had been strong supporters of interdisciplinary policy analysis, advised that RAND assuage Air Force concerns but, at the same time, expand its base of sponsorship within the defense establishment—especially in the Office of the Secretary of Defense.

On the other hand, many of RAND's senior administrators and researchers retained an intense loyalty to the Air Force and perceived much of the policy analysis as somewhat treasonous

to RAND's long-time sponsor. President Frank Collbohm[306] and his corporate administrative staff were particularly adamant in arguing that continued erosion of RAND-Air Force relations was contrary to the interests of national security. The force of such arguments was magnified by the universal opinion in 1959-1960 that the United States was in great peril. As Edward Barlow, a strong proponent of interdisciplinary systems analysis, commented in a memorandum dated 18 February 1960, "The danger to the nation is becoming greater. The Soviet Union has come up so rapidly in a military sense, and continues to act so forcefully, that real concern about the survival of the U.S. and our "Western way of life" is now in the forefront of our minds."[307]

In fact, by the time Barlow wrote this memorandum several of the scientific strategists had acted decisively on their concerns. As their difficulties with Air Force leadership deepened, RAND's scientific strategists continued to believe, indeed with increasing urgency, that their methods and ideas deserved elevated influence in the national policy structure. Alain Enthoven recalled these frustrations in a 1971 interview,

> [I]t became apparent to me as I worked at RAND that we were doing very important studies on very important matters, on which we had conclusions that really should be listened to and acted on, but that our studies were not being acted on and were being received politely and filed away. I became rather fed up with that state of affairs.[308]

Finding Air Force decision-makers to be impervious—if not hostile—to their arguments, some of the RAND scientific strategists sought alternative paths to influence, especially through the Office of the Secretary of Defense. Henry Rowen, for example, used RAND's research contract with ARPA to make important contacts in the office of the Assistant Secretary of Defense for International Security Affairs. By early 1960, these connections had resulted in Rowen's leadership of a arms control research effort at RAND for ISA that was funded indirectly through an ARPA contract.[309] At about the same time, Enthoven became the first of the scientific strategists formally to leave RAND for a position in the Pentagon. Acting on the advice of Charles Hitch, Enthoven secured a position in the Office of the Secretary of Defense under the Director of Defense Research and Engineering, and left RAND for Washington in April 1960. As he saw it, this was "a chance to put into effect a large number of recommendations coming out of the RAND studies."[310]

Most importantly, however, as the 1960 presidential campaign unfolded RAND's scientific strategists engaged in an "end run" around the Air Force when they secretly allied themselves with Senator John F. Kennedy.[311] The possibility that RAND analysts, armed with sensitive Air Force information, might someday attempt to expand their policy influence by going around the Air Force and reaching for higher levels of decision-making had long been a principal concern of both RAND and Air Force leadership. In 1951, for example, L. J. Henderson had warned Frank Collbohm that,

> RAND can get into serious trouble and in the long run defeat its own purposes, reduce freedom of inquiry, and so on, if we express official opinions or try to influence decisions outside the Air Force, where we disagree with the position the Air Force may be taking.[312]

As such, Collbohm and RAND's research administrators had always taken great pains to ensure that official Air Force channels were never circumvented by RAND analysts, even when those analysts were meeting unyielding resistance to their ideas. For RAND managers, an end run was a cardinal sin.

For the scientific strategists, however, their belief in the extreme importance of their own work combined with the opportunity for access to top decision-makers was an undeniable opportunity. John Kennedy had long been a proponent of strong national defense, and one of the cornerstones of his 1960 presidential campaign was his exploitation of the broad public belief following Sputnik that the United States trailed the Soviet Union in intercontinental ballistic missile (ICBM) development. Kennedy, along with many others outside the Eisenhower administration, argued that a "missile gap" existed between the U.S. and U.S.S.R. that threatened American national security. Public concerns over this alleged gap were based in part on the findings of the Gaither Committee—a group of defense experts organized in early 1957 under the auspices of President Eisenhower's National Security Council and chaired by RAND board chairman H. Rowan Gaither, Jr.[313]

The Gaither Committee's top-secret report, entitled Deterrence and Survival in the Nuclear Age, drew heavily on the work of RAND analysts, especially the Wohlstetter group, and was presented to President Eisenhower on 7 December 1957. This thoroughly gloomy report apparently demonstrated severe U.S. inferiority to the Soviet Union in strategic missile development and estimated that while it was unclear when the U.S. would have any ICBMs, the Soviets could be expected to have more than two hundred by 1961. In Gregg Herken's words, the Gaither Committee found the United States to be "tottering on the brink" of destruction.[314] Eisenhower, however, found the report to be excessively pessimistic and in the 7 December meeting he rejected the panel's findings. Despite his rejection, in the weeks following this presentation the key conclusions of the Gaither Report were leaked to congressional critics of the Eisenhower administration, including Senator John F. Kennedy, and subsequently provided substantiation for public allegations of a "missile gap" – allegations that proved dubious at best.

Throughout 1959 and 1960, Senator Kennedy used the missile gap as a recurring theme to excoriate the Republican administration and energize his own presidential campaign. Indeed, some of the senator's most powerful evidence for American deficiencies came from an article published by RAND's principal scientific strategist, Albert Wohlstetter, in January 1959. Wohlstetter's "The Delicate Balance of Terror" was printed in the influential policy journal Foreign Affairs and argued that the Strategic Air Command was highly vulnerable to Soviet attack and might not be able to retaliate for such an assault.[315] Wohlstetter depicted the U.S.-Soviet nuclear rivalry as a very delicately balanced relationship that could swing decisively to one side if tipped just slightly out of balance. While Wohlstetter downplayed the importance of strictly numerical comparisons between U.S. and Soviet missile and bomber forces, his article implied catastrophic consequences if Kennedy's presumed missile gap were a reality. In Kaplan's words, Wohlstetter's article "created a huge sensation among the defense intellectuals along the Washington-New York-Cambridge corridor."[316]

Despite its clarity of logic, however, "The Delicate Balance of Terror" was founded on gravely inaccurate data provided to RAND by the Air Force that ignored mounting evidence within the Eisenhower administration that the missile gap was illusory. First, American U-2 spy plane overflights of the Soviet Union beginning in 1957 failed to confirm the existence of a Russian crash program in missile development—a program assumed to exist by the Gaither Committee and the RAND strategists. While initial U-2 flights indicated that the Soviets might have as many as a dozen operational ICBMs by 1960, further flights caused the CIA's National Intelligence Estimates Board to inform Eisenhower in January 1960 that no crash development program existed. Further, during the summer of 1960, the CIA began to receive photographic data from the agency's new Discoverer satellite that further eroded the credibility of a missile gap.[317]

RAND's scientific strategists who had played a central role in "revealing" the gap were not privy to the intelligence information that dispelled it. Following the leaking of the Gaither Report in early 1959 and the storm of criticism the report engendered, Eisenhower prohibited the release to RAND of the top-secret National Intelligence Estimates prepared by the CIA.[318] This meant that the last such estimate seen by the RAND analysts supported their assumption that the Russians were mass-producing the type of ICBM tested successfully 1957. After 1958, Wohlstetter and his compatriots received intelligence estimates only from the Air Force chief of staff—estimates that were extremely generous in appraising Russian capabilities.[319] In Herken's words, the RAND analysts and others without access to the CIA information, "continued to claim that the Soviets had hundreds or even thousands of ICBMs hidden across the trackless Russian steppes or underneath the arctic tundra. . . ."[320]

RAND's lack of accurate intelligence data had a direct impact on the 1960 Presidential election. In late 1959, RAND scientific strategists including Albert Wohlstetter, Alain Enthoven, Henry Rowen, Daniel Ellsberg, and Fred S. Hoffman agreed to assist the Kennedy campaign under the condition that their involvement be kept secret.[321] The RAND analysts "regularly passed along ideas and helped draft speeches" for Kennedy that facilitated his transformation of the missile gap issue into one of the centerpieces of his victory.[322] When the vast inaccuracy of RAND's missile gap analyses was revealed following Kennedy's election, the organization's analysts found a convenient scapegoat for their errors—the Soviet Union. In 1963, RAND researchers published an extensive report entitled, "Deception in Soviet Strategic Missile Claims, 1957-1962," which concluded, "the Soviet leaders, principally Khrushchev and some top military figures, have practiced deliberate, systematic, and sustained strategic deception."[323] In this report, RAND analysts Arnold Horelick and Myron Rush found that the Soviets executed a deception so systematic and ingenious that it could hardly have been detected by the most expert observers. They wrote,

> The striking characteristic of Soviet strategic claims, when looked at as a whole, is their internal consistency and the logical sequence of their development; despite their false basis in reality, successive claims built on their predecessors and prepared the way for those to follow. The claims were carefully set against the background of Soviet space exploits, which contributed substantially to their credibility. . . . The Soviet leaders generally formulated the claims with care, using a wide variety of deceptive verbal techniques for this purpose.[324]

By laying the blame for RAND's wildly inaccurate appraisal of Soviet missile capabilities, Horelick and Rush sidestepped fundamental questions regarding the reliability of RAND "scientific" analytical methods as well as deficiencies in appraising enemy capacities and motivations. These questions would re-emerge with tragic results as RAND scientific strategists ascended to leadership in the Vietnam War-era Pentagon.

The Scientific Strategists Join McNamara's Band

John F. Kennedy's election to the presidency in November 1960 and Kennedy's selection of Robert S. McNamara as Secretary of Defense in December opened the door to the Golden Age of RAND's political influence and began the rapid diffusion of RAND's "rational" policy analysis methods throughout the federal government. To the Pentagon, the youthful McNamara brought a reputation for aggressive, energetic management and an enthusiasm for sophisticated statistical methodologies. His objectives were quickly and clearly defined: to revolutionize the operation of the Department of Defense by concentrating authority in the Office of the Secretary of Defense

and introducing modern methods of rational decision-making. Following his first feverishly active year in office, few would have questioned his intent or capacity to carry out such a revolution.

During these first twelve months of his administration, McNamara and his largely civilian staff moved aggressively to assert the authority of the Office of the Secretary of Defense over the military branches. They developed a comprehensive menu of projects to analyze defense policy alternatives and completed analyses of over one hundred issues.[325] They also created centralized control over activities that were common to the military services by pulling decision-making authority out of the military branches and placing it in newly created or substantially enlarged Department of Defense agencies such as the Defense Supply Agency, the Defense Intelligence Agency, and the Office of Public Affairs.

The core of the "McNamara Revolution" was a complex administrative system that combined program-based management control with rational decision-making through systems analysis.[326] The Planning-Programming-Budgeting (PPB) system, as it soon became known, embodied the defense economics theories developed at RAND during the 1950s, especially those expressed in a book published by Charles Hitch and Roland McKean in 1960, The Economics of Defense in the Nuclear Age.[327] That book developed the thesis that the economic principle of scarce resources should be a critical component of defense planning, and although this concept did not make much of an impression on the Air Force, RAND's thinking caught the attention of Secretary-designate McNamara. Within months of McNamara's appointment, three of his most powerful subordinates were former RAND scientific strategists, RAND personnel pervaded his staff, and the two methodologies critical to his managerial revolution—program budgeting and systems analysis—were largely RAND products. The next two chapters describe the transformational impact RAND and its methods had on, first, defense policy making, and then, by the mid-1960s, on President Lyndon Johnson's "Great Society" Social Welfare programs.

Back to Table of Contents

Chapter Five
RAND and the McNamara Revolution

During the 1960s, RAND alumni and RAND methodologies fundamentally altered the nature of public policy-making in the United States. Championed as "scientific" means of policy-making, in contrast to the sloppy, politics-driven methods of earlier years, systems analysis and program budgeting spread first from RAND to the Pentagon, and then across the federal bureaucratic structure. RAND's policy analysis and public management methods introduced to defense policy and, later, to social welfare policy-making the use of sophisticated and powerful analytical methodologies. These methods, many of which had been developed and elaborated at RAND, were designed to bring careful, objective reasoning to public policy-making. They permitted the application of a wide range of advanced techniques and disciplinary perspectives to public issues and sought to treat those matters on a systematic rather than piecemeal basis. However, these analytical and management methods had other, potentially less attractive consequences for policy-making where they were adopted: they created an environment of centralized, top-down decision-making; they replaced political bargaining with technocratic expertise as the primary means of policy formulation; and they gave rise to a vast market for policy-oriented social science research.

The dissemination of RAND's defense-bred policy analysis techniques to the Pentagon and then to the wider federal administrative structure is crucial not only to RAND's history but to understanding the subtle influences of the Cold War on American society. RAND was established and flourished as a prototypical Cold War institution, and its intellectual output during its golden years was heavily conditioned by the U.S.-Soviet Union confrontation. During the late 1950s, it appeared to many observers, both inside RAND and in prominent positions in American society, that the United States was losing the Cold War. The Soviet Union appeared to be industrializing faster than the U.S.; the success of the Sputnik launches implied that America had lost its scientific and technological leadership; and Soviet assertiveness, such as demonstrated in the Hungarian uprising of 1956, seemed to contrast with western indecision and ineptitude. Furthermore, the advancing de-colonization of vast areas of the globe had opened a new front in the Cold War—one in which communist ideas and Soviet influence appeared to flourish.

In response, RAND analysts began to look more deeply at the respective strengths and weaknesses of the American and Soviet economic systems, searching for solutions that would reverse a tide that apparently had turned against the United States. During the 1950s, RAND analysts devoted attention to a wide range of Soviet topics, seeking to understand that society's basic strengths and vulnerabilities. In this work, RAND economists were struck by the superior ability of Soviet policy-makers to marshal that country's resources for warfare - of either the hot or cold variety. Whereas the U.S. political system was characterized by a complex system of checks and balances and thus fraught with partisan bargaining, compromise and rivalry, Soviet leaders operating in a command economy were free to employ highly centralized management systems and prosecute Russian strategic objectives with ruthless, single-minded efficiency.[328] RAND analysts therefore committed themselves to conceptualizing a rational policy-making system that could match the perceived efficiency of the Soviet structure.

In retrospect, this perspective on the Soviet system sounds almost absurd, but it carried great weight in the increasingly urgent U.S. political environment of the late 1950s. It is sometimes said that in protracted conflict, the opposing sides tend gradually to resemble one another. Unconsciously or not, this process was in action at RAND during the 1950s as the corporation's research staff—especially its economists—elaborated policy management theories that would

mimic the advantages of Soviet centralized decision-making within the American political context. In March 1960, after three years of preparation, Charles J. Hitch and Roland N. McKean[329] published a definitive statement of the policy analysis and management methods that RAND analysts believed could offset Soviet advantages: The Economics of Defense in the Nuclear Age.[330] Both Hitch and McKean were RAND economists (Hitch was then the head of the corporation's Economics Division) and were deeply involved in the application of mathematical and economic theory to defense policy issues within the framework of general systems theory. The Economics of Defense had been prepared under the support of the Air Force Project RAND contract, and it included chapters by Albert Wohlstetter, Stephen Enke, Alain Enthoven, and Malcolm W. Hoag—all leading figures in RAND's coterie of scientific strategists. Also, while still in manuscript, the book had been read and commented on by the most notable members of RAND's strategic fraternity, including Daniel Ellsberg, Gene H. Fisher, Robert N. Grosse, Oleg Hoeffding, Joseph A. Kershaw, Burton H. Klein, Richard R. Nelson, Henry Rowen, Charles Zwick, Kenneth Arrow, Thomas C. Schelling, and Robert M. Solow. The premise of the book was simple in statement but would prove to be of profound importance for U.S. national policy-making. This premise is asserted succinctly in book's second sentence: "Essentially we regard all military problems as, in one of their aspects, economic problems in the efficient allocation and use of resources."[331]

In The Economics of Defense, the RAND analysts detailed a rational approach to defense policy making that sought to replace the political basis of decision-making with rigorous systematic analysis.[332] They argued that "the problem of combining limited quantities of missiles, crews, bases, and maintenance facilities to 'produce' a strategic air force that will maximize deterrence of enemy attack is just as much a problem in economics (although in some respects a harder one) as the problem of combining limited quantities of coke, iron ore, scrap, blast furnaces, and mill facilities to produce steel in such a way as to maximize profits."[333] However, in private sector industries such as iron and steel, the authors argued, decision-making was subject to the rigors of the market, thus ensuring the efficient allocation of resources among alternative uses. This was not the case in the "production" of national security. In the public sector and—most importantly for the authors' purposes—in defense spending, the efficient use of resources was not compelled by built-in mechanisms like those found in the private sector of capitalist economies. Hitch and McKean argued, "There is within government neither [a] price mechanism which points the way to greater efficiency, nor competitive forces which induce government units to carry out each function at minimum cost."[334]

These deficiencies in public sector decision-making worked to the great detriment of American national security, the RAND analysts argued, because the existing budgeting and policy-making apparatus did not operate as a corrective. In a later book, Hitch described the pre-1961 defense budgeting process as,

> The President would indicate the general level of defense expenditures which he felt was appropriate to the international situation and his over-all economic and fiscal policies. The Secretary of Defense, by one means or another, would allocate this figure among the three military departments. Each military department would in turn prepare its basic budget submission, allocating its ceiling among its own functions, units, and activities, and present additional requests, which could not be accommodated within the ceiling, in what variously called an "addendum" budget, "B" list, etc. Then all the budget submissions were reviewed together by the Office of the Secretary of Defense in an attempt to achieve balance.[335]

RAND analysts found that instead of being rationally organized so as to compensate for the absence of market forces, the existing system was primarily a process "of bargaining among officials and groups having diverse strengths, aims, convictions, and responsibilities," and who "naturally have various 'political' considerations in mind—concerns about the impact of budgetary decisions on the success of rival departments or officials, on the attitudes of voters, on the actions of various groups."[336] This perspective grew out of both research done at RAND by Charles E. Lindblom, which resulted in his research memorandum, "Bargaining: The Hidden Hand of Government," and from the frustrating attempts of RAND's scientific strategists to convince Air Force leaders to adopt their policy suggestions.[337] Indeed, the RAND analysts pointed to the remarkable stability of the budget shares allotted to the military branches as further evidence of the irrationality of the system. From 1954 to 1961, despite rapid technological change and considerable fluctuation in defense spending levels, the portions of the total budget provided to the services displayed virtual uniformity with about 47 percent going to the Air Force, 29 percent to the Navy and Marine Corps, and 24 percent to the Army.[338]

Also, the RAND analysts argued that this so-called "budget ceiling" system separated budgeting from strategy formulation and thereby compounded the inefficiencies resulting from politically-determined resource allocation. Alain Enthoven later recalled that defense budgeting and policy-making "were treated as almost independent activities. They were carried out by different people, at different times, with different terms of reference, and without a method for integrating their activities."[339] On one hand, the development of military strategy was conducted largely within the military branches, with force planning projected several years into the future and calculated on a mission-oriented basis. On the other hand, budgeting was performed mainly by civilians in the service and Department of Defense organizations on a one-year basis and was conducted in terms of object classes of expenditures such as personnel, research, and paper clips. This meant that budgeting was conducted in isolation from military planning. Such circumstances were anathema to RAND's scientific strategists since the very basis of economics lies in melding resource availability with allocation strategy so as to optimize available resources. In <u>The Economics of Defense</u>, this point was made forcefully:

> Strategy, technology, and economy are not three independent "considerations" to be assigned appropriate weights, but interdependent elements of the same problem. Strategies are *ways of using* budgets or resources to achieve military objectives. Technology *defines* the possible strategies. The economic problem is to choose that strategy, including equipment and everything else necessary to implement it, which is most efficient (maximizes the attainment of the objective with the given resources) or economical (minimizes the cost of achieving the given objective)—the strategy which is most efficient also being the most economical. Strategy and cost are as interdependent as the front and rear sights of a rifle.[340]

Most importantly, according to the RAND analysts, the defense system of the 1950s prevented national policy-makers from conceptualizing national security as a complex system of relations but instead resulted in the dangerous fragmentation of defense policy-making. Under the extant system, each of the military services retained virtual autonomy over the use of its budget share and thus pursued force planning according to its own set of objectives and interests. This created a situation in which the several services were rarely working with any coordination and were frequently pursuing strategies that ran at cross-purposes. Charles Hitch recalled,

> The Air Force, for example, gave overriding priority to the strategic retaliatory bombers and missiles, starving the tactical air units needed to support the Army ground operations and the

> airlift units needed to move our limited war forces quickly to far-off trouble spots. The Navy gave overriding priority to its own nuclear attack forces—notably the aircraft carriers—while its antisubmarine warfare capability was relatively neglected and its escort capability atrophied. The Army used its limited resources to preserve the number of its divisions, although this meant that they lacked equipment and supplies to fight for more than a few weeks.[341]

Although by 1955-56 Joint Chiefs of Staff organization had prepared a Joint Strategic Objectives Plan (JSOP) which projected the requirements for major forces four or five years into the future, this effort was, in Hitch's words, "essentially a 'pasting together' of unilaterally developed service plans."[342]

In The Economics of Defense, RAND's analysts argued that national policy-makers must recognize the essentially economic nature of defense decisions in order to correct the deficient defense structure and maximize U.S. military power and national security.[343] Unfortunately, this could not be achieved under the existing regime of decentralized, politically-determined defense resource allocation. Thus, Hitch and McKean advised the replacement of that system with a rationally-designed structure that compensated for the absence of market forces by "building-in" rigorous systematic analysis of alternative allocation strategies.[344] Operationally, the authors argued, such a strategy involved two components. First, the institutional arrangements within the government must be reorganized so as to centralize both budget and military policy-making and place these under the direction of the Secretary of Defense. Specifically, Hitch and McKean recommended a "program-based" budget structure which recast budgets and accounts based on end-product missions or programs (e.g., strategic nuclear forces, limited war forces), rather than the costs of objects. According to the RAND analysts,

> We cannot appraise the adequacy of the defense budget, either subjectively or with the aid of quantitative analysis, by thinking about the gains from such categories as paper clips, petroleum, or personnel. Nor can we go to the other extreme and think in terms of a single national security program. Such an aggregation is too broad; we have no conception of units of "national security" that could be purchased. But there are possibilities between these extremes—aggregations of activities that produce species of end-products such as capabilities for nuclear retaliation or for limited war.[345]

Such a system would serve not only to reveal more effectively the true costs and capabilities of the military establishment, but it would also concentrate decision-making authority in the hands of top policy-makers who alone have the necessary detachment from parochial interests to consider objectively over-all strategic issues.

The second component of the RAND's program budgeting strategy was the implementation of systems analysis techniques to aid policy-makers in choosing the most efficient alternative allocations and methods. Recall that systems analysis was an approach to problem-solving developed largely at RAND during the late 1940s and 1950s that sought to make scientific—and thus de-politicized—decisions in situations of great uncertainty. For the purposes of rationalizing defense policy-making, RAND's scientific strategists argued that the detached, quantitative techniques they espoused provided top-level decision-makers with the means to allocate defense resources most efficiently. This meant that defense policy-making need no longer be delegated to military personnel, who were experienced in military matters but whose pursuit of parochial service interests prohibited their comprehension of the total national security "system." Thus, the combination of program budgeting and systems analysis proposed in The Economics of Defense

both centralized defense policy-making and provided executive leaders with "scientific" decision tools that replaced inherently biased experience with rigorous, quantitative analysis. As they realized, the program budgeting system advocated by the RAND analysts required, rather unrealistically, the wholesale restructuring of the defense establishment and the suppression of powerful vested interests in the military branches. While the creation of such a system might counter Soviet policy-making advantages, it was unclear where a force strong enough to prosecute such revolutionary changes could be found.

The McNamara Revolution

Robert S. McNamara serves as an outstanding counter-example to the argument that individuals matter little to historical development. For better or worse, McNamara helped to lead the fundamental restructuring of three of the most important organizations in the post-World War II global economy: the Ford Motor Company during 1950s, the U.S. Department of Defense during the 1960s, and the World Bank during the 1970s.[346] His designation by President-elect John F. Kennedy as Secretary of Defense in December 1960, brought to the Pentagon a man of apparently unlimited energy who was committed to rational, quantitative management and the centralization of authority. Appointed at the youthful age of 44 years, McNamara seemed to personify the vigor and power of John Kennedy's "New Frontier" leadership.

Robert McNamara was a native Californian who graduated from the University of California at Berkeley with a Phi Beta Kappa and, after a brief stint as a sailor and sailors' union organizer, earned a master's degree at Harvard's Graduate School of Business Administration. After a year in the accounting firm of Price, Waterhouse, McNamara returned to academia as an assistant professor of accounting at the Harvard Business School. With American entry into World War II, his special interest in statistical control techniques brought him into contact with the Army Air Forces, which had contracted with Harvard for the training of service personnel in these methods. By 1943, McNamara was in an A.A.F. uniform, working in the "Statistical Control" unit, the task of which was to form a network of statistical officers around the world that would "collect, organize and interpret facts and figures on personnel and equipment" so as to optimize Army Air Force operations.[347]

McNamara's work in the A.A.F. was decisive in redirecting his career. In the service, McNamara worked with the enterprising head of the A.A.F. statistical control office, Charles "Tex" Thornton, who, at the war's conclusion, negotiated an arrangement with Henry Ford II, the president of the Ford Motor Company, to hire ten Army Air Force statistical officers as a package deal in January 1946. The Ford Motor Company was, at that time, in chaos following decades of neglect to its administrative operations, and McNamara and the nine other "Whiz Kids" moved to Ford to form an "executive agency" that would apply statistical control and management methods to the stricken firm. At Ford, McNamara's rise was rapid and unorthodox. Contrary to the traditional career path that took promising young men with engineering backgrounds through Ford's plant operations and into the corporate hierarchy, McNamara and the other statistical officers lacked any technical experience in automobile production and had started near the top of the corporate structure. As such, McNamara's ascendance to the presidency of Ford was not by way of engineering or sales, but through finance and corporate control. Similarly, his success as a manager was not based on practical or technical experience, but the detached application of quantitative analytical techniques.

As he took the reins of the Department of Defense in January 1961, McNamara sought to bring to the national security establishment the rational management methods he had championed in industry.[348] In particular, he pushed to accelerate a long-term trend toward centralization and

"civilianization" of authority in the DOD. This process had begun in 1947 with the passage of the first National Security Act, which established the basic postwar structure of the armed forces and placed them under the nominal authority of a civilian Secretary of Defense.[349] Despite its apparent vesting of authority in civilian hands, however, this act provided the Secretary of Defense with few tools to assert control, and the military branches and their respective secretariats were left with near complete autonomy in policy-making. While subsequent revisions of the 1947 act gradually proffered greater powers on the Secretary of Defense, a tradition of defense management held sway throughout much of the 1950s in which the President and Secretary of Defense determined total defense expenditure levels and allotted shares of this total pie to the services. The services were then largely free to spend these moneys as their leaders saw fit, with significant civilian input only in "civilian" areas such as research and finance. In this decentralized system, the Secretary of Defense assumed a rather passive role, often acting as little more than a referee between the contentious service branches.

The intense inter-service rivalries and relative impotence of the central defense authority that marked defense management in the 1950s came under sharp attack in 1957 when the Soviet Union launched Sputnik I. Critics of the existing defense administration, especially Democrats such as Senator Henry Jackson[350] of Washington, argued that while the U.S. military branches had wasted time and vast sums in competition with one another, the Soviets had seized the technological initiative. Without corrective action, the communists would soon gain a decisive military superiority over the United States and be in a position to press forward their perceived ambitions for global hegemony. An extensive and influential report on American defense posture sponsored by the Rockefeller Fund and published in 1958 was severely critical of the diffuse nature of national defense policy-making.[351] The report advised that the United States move towards a defense budgetary system that "corresponds more closely to a coherent strategic doctrine" and that would overcome inter-service rivalries.[352] Finally, the colossal destructive power of nuclear weapons and, by 1958, their imminent proliferation among the U.S. service branches further strengthened arguments for effective and centralized civilian control of the armed forces. Increasingly, U.S. policy makers recognized that the nation had to have a system that guaranteed absolute control of those weapons.

As a result of this pressure, Congress finally gave legal teeth to the 1947 act by passing the Department of Defense Reorganization Act of 1958, which eliminated the military departments from the chain of command and created a direct line of authority from the President and the Secretary of Defense, through the Joint Chiefs of Staff to the field commanders.[353] Executive authority was thus vested in the Office of the Secretary of Defense while the mission of the three military departments and their secretaries was reduced, essentially, to that of organizing, training, equipping and supporting the combat forces assigned to the unified and specified commanders.[354] Military doctrine remained the responsibility of the separate service branches, as did budgets, programs, and, to a limited extent, research and development. The 1958 act greatly diminished the operational authority of the military Chiefs of Staff by eroding their powers of unilateral command.

Despite the intent of Congress, however, the 1958 act did not immediately alter the decentralized nature of the defense establishment. On one hand, this was because the Secretaries of Defense who served the Eisenhower administration during 1958-61 were neither able nor willing to assert control over the military branches. This situation was exemplified in 1958 when the Senate Armed Services Committee instructed then-Secretary of Defense Neil H. McElroy to select either the Nike-Hercules or Bomarc missile as the nation's continental air defense missile, but not both.[355] In hearings before the same committee a year later, McElroy advised the Congress that his office was unable to decide on a division of funds for Hercules and Bomarc and

suggested that Congress make the decision. The Congress thus solicited the advice of the services and found that,

> The Army wanted interceptor aircraft and Hercules, but not Bomarc. The Air Force not unexpectedly agreed with the Army on the need for interceptors, but recommended Bomarc and not Hercules. Since the Navy had no mission in this area, it contended that no forces were needed for continental air defense. Since no agreement could be reached among the Services, the administration made an arbitrary cut across all the forces involved.[356]

Similarly, the incumbent Secretary of Defense for the last year of Dwight Eisenhower's presidential administration, Thomas Gates,[357] was a strong proponent of decentralized management. In 1960, he told the House Defense Subcommittee, "I have been one who believed that you must in the most modern sense decentralize and hold people responsible, and then coordinate."[358] Thus, as the Kennedy-Nixon presidential campaign swung into full force during the late summer of 1960, the military services "still dominated the policy-making machinery in the areas that counted."[359]

National defense was at the center of the 1960 campaign as candidate John Kennedy charged the Eisenhower administration with surrendering American military superiority to the Soviet Union. To dramatize his commitment to reforming U.S. national defense, Kennedy formed, under the chairmanship of Missouri Senator Stuart Symington,[360] a "Committee on the Defense Establishment" (the Symington Committee). This committee was assigned to investigate the management of the Department of Defense and its related agencies, concentrating specifically on the relationships between civilian and military decision-making in the defense establishment. Kennedy further instructed the Symington group to recommend by 31 December 1960, such changes "as may be necessary to remedy present basic weaknesses in the administration and management of our national defense establishment."[361]

The members of the Symington Committee were Senator Symington, long a vigorous proponent of U.S. military power, Clark M. Clifford,[362] Thomas K. Finletter,[363] Fowler Hamilton,[364] Marx Leva,[365] Dr. Edward C. Welsh (legislative assistant to Senator Symington and executive director of the committee), and Roswell L. Gilpatric. Of this distinguished group of Cold Warriors, Roswell Gilpatric appears to have assumed the most active role and, following Kennedy's election victory, was appointed Deputy Secretary of Defense under Secretary McNamara. Gilpatric was a member of the New York law firm of Cravath, Swaine & Moore, a former Under Secretary of the Air Force, chairman of the board of trustees of the Aerospace Corporation, and had been a member of the Rockefeller Fund project on national defense during the mid-1950s.[366] In 1960, Gilpatric was one of four national security advisors to candidate John Kennedy and strongly favored a fundamental reorganization of the defense structure.[367] In a lengthy memorandum to Senator Symington dated 21 September 1960, Gilpatric expressed his views concerning the deficiencies of the Department of Defense in words that found their way, almost verbatim, into the group's final report:

> The existing structure of the U.S. defense establishment is still patterned primarily on a design conceived in the light of lessons learned in World War II. The changes in the basic legislation effected in 1949 and 1958 and the so-called reorganization of 1953 did not alter the essential character of our military organization. Hence it can be truly said that since 1947 there has been no fundamental change in the scheme of organization of our armed forces. . . . Yet, during this period of nearly a decade and a half, the whole state of the art in military science has been revolutionized as epitomized in the transitions to the jet, nuclear and space

> ages. No longer is the mission of the military forces of the United States to prevail in a World War II type of open warfare; now it is to insure the defense and survival of the nation in an era of cold war and protracted conflict.[368]

As the Symington Committee members exchanged memoranda concerning possible strategies throughout September and October 1960, consensus quickly emerged in support of dramatically augmented centralization of the Department of Defense. Some members, including Senator Symington, even flirted with the long-controversial notion of formal unification of the armed forces. In a memorandum dated 10 October, for example, Symington wrote, "No longer can an arbitrary division of forces into 'land', 'sea', and 'air' meet the realities of the present or the requirements of the future."[369] While the final report of the committee, presented to now President-elect Kennedy on 26 November 1960, did not recommend definitive unification of the armed services, it did advocate a fundamental restructuring of authority within the Department of Defense.[370] Among other things, the Symington Committee advised that the military services be retained, but that the existing departmental structure of the Army, Navy, and Air Force be eliminated along with the service secretariats. According to the Symington plan, the military branches would remain separate organic units, albeit within a single department, and subject to the direction, authority, and control of the Secretary of Defense. Also, the report advised the creation of three new unified commands, a strategic command (responsible for all strategic missions), a tactical command (responsible for all limited and conventional missions), and a defense command (responsible for all continental defense missions). Each of these new inter-service commands would include all personnel, equipment, and weapons systems necessary for the performance of their respective missions, thereby severely eroding the size of the independent services.[371]

The Symington Committee report instantly became a political hot potato as the military branches charged that it advocated unification of the armed forces. Army Navy Air Force Review, for example, exclaimed that the document was,

> a highly controversial blueprint that calls for major overhaul of the Pentagon and the Armed Forces. . . . The committee's recommendations—most of which have been repeatedly rejected in the past by the Congress—will receive a harsh reception on Capitol Hill. If the new Chief Executive accepts the proposals without extensive modification, he must expect to run headlong into one of the toughest fights his Administration will ever encounter.[372]

This front-page diatribe went on to list the powerful group of congressmen, most of whom were Democrats, who could be expected to contest the implementation of the Symington plan. While the strident response of the military and its published champions probably overstated the rancor engendered among congressmen by the report, the President-elect certainly would not have relished the thought of beginning his tenure with a legislative struggle against members of his own party. Kennedy quickly distanced himself from the report and made no formal endorsements of the committee's findings.

Kennedy's apparent lack of enthusiasm for the Symington report, however, did not dampen his desire for fundamental changes in the defense structure. His meetings with Secretary-designate McNamara left no question that he would support vigorous efforts to reshape national defense policy-making. Like Kennedy, McNamara believed that the elimination of the military departments, as advocated by the Symington report, would create "too much *sturm und drang* on the Hill," and that he could just as effectively enforce his will without formal restructuring.[373] Thus, McNamara accepted Kennedy's offer of the secretary's post under two conditions: that he

be allowed to select his own colleagues and staff members and that he would not be expected to present a formal reorganization of the Department of Defense, at least during the first year."[374]

Upon assuming office in January 1961, McNamara's agenda was clear. Drawing from his experience at Ford, he conceptualized the national defense establishment as a massive and complex production system, characterized by inputs and outputs that could be rationally organized and analyzed so as to achieve optimal efficiency. As was the case at Ford, he saw centralized control in the hands of a very few expert managers to be the most effective way to pursue that efficiency. His Deputy Secretary, Roswell Gilpatric, remarked,

> [McNamara] made it plain [in mid-December 1960] that he intended to operate with a very small, top group. He didn't want a large span of control. . . . [H]e always expressed a strong belief that a very few people at the top of a great pyramid like the Pentagon could make the critical decisions, based on adequate information, and then delegate down to the lowest levels possible in the pyramid the authority and responsibility for carrying out various phases of the decisions.[375]

Thus, McNamara recognized the heightened authority granted his office by the defense reorganization act of 1958 and moved to leverage that authority by adopting a new mode of management rather than a new organizational structure. That new mode would emphasize centralized control, civilian management, and the employment of quantitative analytical techniques.

Within days of his nomination by President-elect Kennedy, McNamara had read and absorbed the ideas of the RAND economists, recently published in Hitch and McKean's The Economics of Defense in the Nuclear Age. Here was a rich source of ideas, albeit untested and not fully defined, that meshed easily with his own predisposition for systems thinking and quantitative, rational management.[376] Essentially, the ideas of Hitch and his colleagues at RAND offered the achievement of centralized control—the objective of the Symington report—without conducting a politically tortuous assault on the military establishment. The combination of program budgeting and systems analysis offered a *methodological* solution to what had previously been perceived as a strictly *structural* problem. In his first meeting with Gilpatric, in mid-December 1960, McNamara expressed his desire to bring Charles Hitch onboard his administration and asked his Deputy Secretary to contact Hitch and offer him the job of Assistant Secretary of Defense—Comptroller.[377] Hitch's job would be to implement the defense policy methods developed at RAND, and he quickly accepted the position.

Hitch immediately telephoned Alain Enthoven in the office of the Director of Defense Research and Engineering and asked him to move over the comptroller's office as the Deputy Assistant Secretary for Systems Analysis. Enthoven had, unknowingly, timed his earlier move to the Pentagon impeccably. By the time McNamara and Hitch took office, he "knew a lot about where the walls and the woodwork were, and what some of the main problems were firsthand."[378] Within days of taking office, Hitch also made arrangements to have his former colleagues at RAND assist his OSD staff in defining Department of Defense program packages for budgeting purposes and in analyzing the total resource implications of these packages over five years.[379] For this purpose, RAND's economics and cost analysis departments established an office in Bethesda, Maryland, with fourteen staff members from Santa Monica and ten new recruits.

Henry Rowen also joined Hitch and Enthoven in McNamara's Office of the Secretary of Defense. Rowen had taken a leave of absence from RAND during the fall of 1960 to work on a book at Harvard and, while at a meeting of the International Institute for Strategic Studies at Oxford University, made the acquaintance of Paul Nitze.[380] At the time, Nitze[381] was the chairman

of presidential candidate Kennedy's national security staff and upon Kennedy's election was appointed Assistant Secretary of Defense-International Security Affairs. Nitze asked Rowen to assist him as a consultant and, having further developed a favorable opinion of Rowen, appointed him to be Deputy Assistant Secretary-ISA in the crucial European security area.

At the same time, a sizable group of RAND systems analysts who remained in the corporation's employ were loaned, for various periods of time, to the Department of Defense. In a "sensitive talk" given to the corporation's board of trustees in November 1961, RAND Economics Department head Joseph A. Kershaw[382] revealed,

> It is perhaps not so widely known that a good many people who still are at RAND have been loaned for various periods of time to various parts of the Defense Department. . . . Some of this [work] is so highly classified that we can't even talk about it here, but perhaps you will take my word for it that perhaps a dozen RAND people have had a hand, and an important one, in many of the most important national security matters before the nation.[383]

The opportunities created in the Office of the Secretary of Defense (OSD) for RAND's scientific strategists catalyzed a migration from the "Santa Monica priory" to the Pentagon.[384] On one hand, McNamara's advent opened the door to the top-level policy influence long sought by the RAND analysts. Frustrated by the slowness of the Air Force to embrace their ideas, the scientific strategists' sudden access to the lofty domain of the OSD placed them at the pinnacle of the defense hierarchy. For McNamara, RAND was a source of energetic young men who shared his detached, analytical outlook and in whose ability and judgment he had immediate confidence. According to Gilpatric, "the main inspiration for McNamara's initial thinking and ultimately his basic white papers, position papers, came from the RAND group."[385] Former RAND analysts like Hitch, Alain Enthoven, and Henry Rowen, along with a handful of kindred spirits recruited elsewhere such as Harold Brown and Adam Yarmolinsky became the new "Whiz Kids," a reminder for McNamara of the heady days at Ford when he and nine other young men had taken that moribund giant by storm.

Planning-Programming-Budgeting in the Department of Defense

Rather than easing into his new job and enjoying the customary "looking around" period, Secretary of Defense McNamara and his staff immediately embarked on an in-depth analysis of the major issues facing the Department of Defense. In early March 1961, the Secretary assigned to the Joint Chiefs of Staff, the military departments, and various elements of his own staff ninety-six critical requirement problems, including such formerly sacrosanct issues as, "should the United States deploy long-range manned bombers?"[386] Furthermore, these studies differed from the rather innocuous inquiries that had historically emanated from the Office of the Secretary of Defense (OSD) in that they demanded systems analyses employing both intensive economic and military examination in which respondents explicitly compared the cost effectiveness of alternative ways of accomplishing national security objectives.

The new Secretary's aggressive style came as a rude shock to military leaders more accustomed to passive civilian leadership. Roswell Gilpatric, for example, recalled McNamara's unqualified rejection of a Pentagon tradition—the military briefing:

> The military . . . was always somewhat on guard and skeptical, perhaps apprehensive, because of the way in which McNamara operated, and the fact that he wouldn't listen to briefings. None of the elaborate presentations which had been racked up for the secretary

> and the deputy secretary and the other new people at the beginning were ever listened to by McNamara. He didn't like flip charts, didn't like men in uniform with pointers reading off things. He wanted to ask his own questions, and he wanted unstereotyped answers, and that threw them off. And also, he was not very much on tact and diplomacy in the way he handled them.[387]

McNamara moved with equal sureness to reconstruct management procedures along the program basis laid out in The Economics of Defense. As one of his first acts, the Secretary formed three task groups within his staff to perform detailed review and overhaul of the defense budget.[388] These three groups were organized around what McNamara and his staff considered the three primary "products" of the Department of Defense: strategic offensive and defensive forces (headed by Charles Hitch), limited war forces (Paul H. Nitze), and research and development (Herbert F. York[389]). As Assistant Secretary of Defense—Comptroller, Hitch was responsible for pulling the three projects together and using the massive volumes of data they generated to design and implement a new, centralized budgeting system that soon came to be called the Planning-Programming-Budgeting (PPB) system.[390]

After surveying the massive task at hand, Hitch informed McNamara that he would need at least eighteen months to devise and implement the new budget system. For McNamara, however, this was not soon enough. The Secretary intended to base his first budget (fiscal 1963) on the program budgeting system and ordered the pallid Hitch, who was slowly recovering from a bout with pneumonia contracted in March 1961, to ready the new system within six months.[391] To accomplish this heroic task, Hitch called on his old associates at RAND for assistance. Hitch immediately contracted with RAND for support in developing Department of Defense program packages and in performing systems analyses of the resource implications of these packages for five years into the future. To provide this support, RAND established its office in Bethesda, Maryland. Thus, from the earliest date, not just RAND expatriates but current RAND staff members were integral to the implementation of McNamara's new management system.

Hitch and his colleagues derived the main intellectual components of the new defense management system from The Economics of Defense and the research that lay behind it.[392] Ideally, the new system would treat the defense establishment as a whole rather than as a proliferation of autonomous units, each of which pursued its own largely self-defined mission. According to the new plan, the "production" of national security involved inputs (such as personnel and titanium), that were converted into forces (such as the strategic retaliatory force), which subsequently produced outputs (such as deterrence of Soviet nuclear attack). The complex but finite set of relations within this system could be quantitatively modeled and analyzed such that the outputs both matched national objectives and optimized the employment of available resources. The centralization of policy-making authority was crucial because it placed decision power in the hands of those top civilian leaders who could view the national security system holistically and act according to national rather than parochial interests. This implied a more authoritarian management system that permitted top leaders to implement their policy decisions and thus eradicate the irrational, political bargaining that had previously driven resource allocation. Centralized decision-making also required that the defense management system provide a range of policy alternatives to top leaders in such a way that these alternatives could be compared with precision and in relation to policy objectives. Thus, quantitative systems analysis based on cost-effectiveness rationale would be a centerpiece of the management system, and a multi-year horizon would be employed so that such analyses would harmonize budgeting, policy-planning, and weapons development timeframes.

Hitch and his staff first undertook the development of "program elements" and "program packages" that would form the building blocks of the new management system.[393] They defined program elements as integrated activities—combinations of personnel, equipment, and installations—whose effectiveness could be related to national security policy objectives. Such program elements included B-52 wings, infantry battalions, and combatant ships, together with all the equipment, men, installations, supplies, and support required to make them effective military forces. Hitch and his staff attempted to identify each specific item or activity that would meet the definition of a program element. They then organized these into large, related groups and finally into "program packages," which corresponded to the primary missions or "outputs" produced by the Department of Defense. Working with Secretary McNamara's input and approval, Hitch designed the program packages to cut across service boundaries and embody the principal subsystems of the defense establishment. Initially, the OSD defined seven such packages: General War Offensive Forces, General War Defense Forces, General Purpose Forces, Sealift and Airlift Forces, Reserve and National Guard Forces, Research and Development Projects, and Support (a residual category that included all activities not readily allocable to missions, forces, or weapons systems—including recruiting, technical and professional training, supply and maintenance systems, medical support, intelligence, and higher headquarters). The General War Offensive Forces program package, for example, incorporated a large number of categories, including aircraft forces, land-based missile forces, sea-based missile forces, command, control, and communication systems, and headquarters and command support. The standardized list of program elements and program packages developed by the OSD thus served as the general framework within which budget program proposals could be submitted and analyzed.

The RAND management system as implemented by Hitch and the OSD staff was a three-phase process consisting of the planning and review of requirements, the formulation and review of programs extending several years into the future, and the development of the annual budget estimates—hence the name Planning-Programming-Budgeting system. Hitch and his team initially conceived the planning phase as a year-round process, but it quickly evolved into a discrete annual operation. The planning phase began with the preparation of the Joint Strategic Objectives Plan by the Joint Chiefs of Staff organization, which recommended to the Secretary of Defense the military forces and programs that should be supported over the next five years. Once received by the OSD, Secretary McNamara and his advisors subjected the military recommendations to rigorous review. The Secretary then made preliminary decisions concerning force planning and returned "tentative force guidance" documents to the military to serve as the basis for their formal program proposals.

The second phase—programming—took place within the framework of the program elements and packages defined by the OSD and described above. The military departments submitted proposals for new programs and changes to existing ones, projecting the implications of these proposals at least five years forward. OSD systems analysts under the direction of Alain Enthoven scrutinized these proposals with the objectives of defining program goals, identifying alternative courses of action that might achieve those objectives, estimating the costs or resources required by each alternative, developing mathematical models to represent the probable situations in which alternatives would operate, and formulating criteria to test the alternatives.[394] By setting the terms of policy debate, Enthoven's systems analysis office assumed a very powerful role in policy-formation and frequently advocated its own counter-proposals to military program offerings. At this point, McNamara and his top advisors selected among the alternative proposals and constructed the Five-Year Force Structure and Financial Program, which served as the binding policy document for all components of the Department of Defense. In the final step in the management process—budgeting—Hitch and his staff translated the Five-Year Program into

procurement lists, production schedules, lead times, prices, and all other facets involved in annual budgeting.

The Draft Presidential Memorandum (DPM) was a final component of McNamara's management system that emerged over his first year in office.[395] DPMs were not a formal part of the PPB system but originated in 1961 when President Kennedy requested from Secretary McNamara a "white paper" on U.S. nuclear strategy and forces. In response to this request, the OSD drafted a policy statement on this highly controversial set of issues and circulated it for review and comment among the relevant military and civilian agencies of the Department of Defense under the designation "Draft Presidential Memorandum." According to McNamara, the DPMs "seemed like a good device to get the views of appropriate departments for my own review. By passing them back and forth we were able to force the divergent views to the surface. I insisted that each party of interest comment."[396] Whereas only two DPM's were circulated in 1961 (one on strategic nuclear forces and one on general-purpose forces), the number grew to sixteen by 1968.[397] By 1965, the DPM had become a principal policy-making device and played a key role in McNamara's centralized management system. As Sanders observes, "By stating explicitly [McNamara's] conclusions, recommendations, and especially his rationales, he may have provided a target for dissenters to shoot at, but at the same time he forced his critics to argue on his terms, on his issues, with his language, and with his preferred types of analysis."[398] Indeed, the DPMs were far from "trial balloons" on central issues; most frequently the preliminary decisions they outlined changed little following military input. Also, since the systems analysis office had drafted all but two of these policy statements, their use further magnified the policy influence of Enthoven and his staff.[399]

While the implementation of the PPB system rapidly elevated control of the defense administration and policy-making to the upper management levels of the Department of Defense, it also stimulated a rising tide of resistance within the military branches. From the start of Robert McNamara's tenure as Secretary of Defense, his relations with service leaders had been strained. Within weeks of taking office, two circumstances served to magnify McNamara's suspicion of the military and fuel his desire for control. The first was the disintegration of a B-52 carrying two 24-megaton hydrogen bombs over rural North Carolina.[400] While neither bomb detonated, one fell unimpeded to the earth, and subsequent inspection revealed that of the bomb's six safety devices only one had functioned properly. An utterly horrific accident had thus been averted by the slimmest of margins. Herken notes that the investigation of this near-catastrophe brought to McNamara's attention scores of accidents that had marred America's nuclear weapons programs, including the accidental launching of short-range missiles carrying nuclear warheads. These chilling findings reinforced the Secretary's desire to assert firm, centralized control over the nation's thermonuclear forces. Second, during his first months in office, McNamara gradually became aware that the highly publicized "missile gap," which presidential candidate Kennedy had used quite effectively in the presidential campaign, was fictional. McNamara agreed with Deputy Secretary of Defense Gilpatric in concluding that the episode "was one of those ploys for which the military were partly responsible, just to . . . make everybody's flesh creep and maybe get more weapons programs."[401]

Military leaders, and especially those of the Air Force, despised McNamara's aggressive management style and instantly recognized the threat he posed to their jealously guarded primacy in military policy-making. Within a few months, relations between the civilian officials who dominated the OSD and their military counterparts in the services and the Joint Chiefs of Staff organization had deteriorated considerably due largely to the abrupt shift in power and influence from the military to the scientific strategists and a clash of personalities and operating styles.[402]

Military hostility was first focused on McNamara's Whiz Kids, who appeared to be appropriating much of the influence formerly reserved for experienced military officers.

Whereas military officers had an ingrained respect for seniority and rank, the Whiz Kids had been hired mainly from research institutions such as RAND and academia. They placed greater value on intellectual productivity, creativity, and reasoning power than on the use of proper channels in advocating ideas.[403] As Sanders remarks, "Here was a generation gap of major proportions. It should come as no surprise that senior military officers reacted negatively when a 35-year old told them that the programs their Services were proposing had serious deficiencies."[404] The Whiz Kids' enthusiastic prosecution of McNamara's management policies, in particular the tendency of Enthoven's systems analysis group to circumvent lines of authority, conveyed the impression of intellectual arrogance and directly challenged the military experience of service leaders. W. Barton Leach,[405] a Harvard Law professor and close adviser to Secretary of the Air Force Eugene M. Zuckert wrote to Zuckert,

> I personally have been shocked by the arrogance of quite junior civilian personnel toward very senior military officers. I regret to say that some of these junior civilians have been my own former students; and I assure you that I have given them a post-graduate lecture which they will not soon forget.[406]

The perceived arrogance of his subordinates quickly reflected on McNamara and began to poison his relations with service leaders. By April 1961, the military press was already criticizing the new Secretary's aggressiveness and his apparent unwillingness to include military figures in decision-making. The Register and Defense Times, for example, wrote,

> [T]he youthful McNamara has launched his own direct-action plan to improve efficiency in the Defense Department . . . with only cursory consultation with the Joint Chiefs of Staff. . . . It does seem a little odd that the nation's top military men, experts in the art of national defense, are given short shrift in deciding vital defense issues destined to have far-reaching effects on the military establishment. In industry, an error in judgment may result in a financial loss. In the Defense Department a mistake can endanger our future freedom."[407]

Soon, McNamara was facing overt criticism from top military officers in widely read publications. General Thomas D. White,[408] recently retired Air Force Chief of Staff, wrote in the Saturday Evening Post,

> In common with many other military men, active and retired, I am profoundly apprehensive of the pipe-smoking, tree-full-of-owls type of so-called professional "defense intellectuals" who have been brought into this nation's capital. I don't believe a lot of these often over-confident, sometimes arrogant young professors, mathematicians and other theorists have sufficient worldliness or motivation to stand up to the kind of enemy we face.[409]

Not surprisingly, the PPB system implemented by Hitch and other former RAND intellectuals also drew heavy fire from the military. On one hand, PPB's reliance on systems analysis was seen by powerful critics such as David Lilienthal,[410] former chairman of the Atomic Energy Commission and former head of the Tennessee Valley Authority, as pseudo-scientific chicanery perpetrated by an ambitious fraternity of "methodologists" to conceal and legitimize their own policy biases.[411] These observers argued that the lacking methodological rigor of systems analysis permitted broad variation in its use, and that the results of any given systems analysis could be

skewed so as to support its author's policy positions. Air Force Assistant Secretary for Research and Development Alexander Flax[412] noted that the OSD systems analysts "had their positions on weapons systems, their favorites and the ones they didn't like, and they tended not to present to the Secretary . . . balanced, objective papers which gave the pros and cons."[413] Even intellectuals most closely involved in the development and application of systems analysis recognized its susceptibility to manipulation. Physicist Bruno Augenstein,[414] spent most of the 1950s at RAND and returned there as vice president for research in 1967, recalled, "You could adjust the systems analysis to get a very wide range of answers."[415]

On the other hand, military leaders quickly recognized the PPB system for what it really was: a methodological mechanism for achieving centralized control of the defense administration. Since the PPB "program packages" transcended service divisions and converted the ultimate units of analysis to systemic constructions like "general war forces," they served to pull strategic and, to some extent, operational policy-making out of the individual services and relocate it in the OSD. Indeed, many of McNamara's critics argued that, in essence, he was pursuing the underhanded implementation of the Symington Committee recommendations, and, perhaps, setting the stage for ultimate unification of the armed forces. In October 1961, for example, Army Navy Air Force Journal published an article entitled, "Whose Imprint on Reorganization Changes—Symington or McNamara?" that compared the Symington report recommendations with actions taken to that date by Secretary McNamara.[416] Furthermore, McNamara's creation of several new defense agencies charged with centralizing "standard" activities performed by all the services added fuel to such arguments. By the end of his first year he had created two such agencies: the Defense Intelligence Agency (DIA), which was to unify and coordinate all defense intelligence activities, and the Defense Supply Agency (DSA), intended to "provide the most effective and economical support of common supplies and services to the military departments and other DoD components."[417]

Air Force Resistance to the McNamara Revolution

Among the military services, the Air Force resisted McNamara's "revolution" most vigorously. Some of the earliest weapons systems attacked and eventually killed by the OSD systems analysts were key Air Force programs, such as the B-70 bomber and the Skybolt air-launched ballistic missile program. In these two cases, OSD analysts argued, as several of them had at RAND, that the B-70 was inferior to ballistic missile systems and that Skybolt's utility was overshadowed by the Minuteman and Polaris missile systems. Further, such items as the Air Force's proposed use of two pilots rather than a pilot/navigator team in the new F-4 jet fighter came under the scrutiny of the analysts, and Air Force planners had continuously to re-design programs in accordance with OSD recommendations. In 1962, a top Air Force development officer complained, "Creativity is not nurtured in a straight-jacket of controls imposed by well meaning but overzealous administrators who become project engineers several echelons removed from the scene of the effort."[418]

McNamara's Secretary of the Air Force, Eugene M. Zuckert was caught in the middle of the deepening schism between OSD and Air Force leadership. In 1963, Zuckert expressed his frustration concerning the rapid erosion of Air Force control over its own operations to Air Chief of Staff Curtis E. LeMay:

> I am struck by the number of OSD-directed studies currently in progress relating to Air Force management and programming. We are to cooperate with Mr. Hitch in conducting a base structure study; we must submit a study on the future Air National Guard and Reserve Forces

> structure; we must submit another study on rated requirements and flying training program; we are answering Mr. McNamara on how to reduce personnel in Europe; and we must conduct with him a review and analysis of our total manpower requirements. The OSD-directed Cost Reduction Program is also intimately related to Air Force management activities.
>
> The future prospects of Air Force manpower and dollar resources, and the active interest of OSD in Air Force programs, attested by the current number of studies, leads to the conclusion that we must organize a systematic campaign of our own. . . . Otherwise, we are apt to lose control over our own management. . . .[419]

Air Force historian George M. Watson, Jr. argues that no Secretary of the Air Force assumed that office possessing as much knowledge about it as did Eugene M. Zuckert in January 1961.[420] After World War II, Zuckert had served for over five years as an assistant to Stuart Symington, then Assistant Secretary of War for Air, and as Assistant Secretary of the Air Force for Management. He also brought to the office a long personal friendship with the man who appointed him Secretary of the Air Force, Robert McNamara. Zuckert had been a colleague of McNamara's on the faculty of Harvard's Graduate School of Business Administration in the early 1940s and, with McNamara, comprised the only two faculty members who supported Franklin Roosevelt against Wendle Wilkie in a 1940 presidential election poll.[421] Indeed, when President-elect Kennedy invited McNamara to Washington, D.C. in December 1960, to offer him the position of Secretary of Defense, McNamara and Zuckert had dinner and a long talk at Zuckert's home during which Zuckert advised McNamara to take the job.

Zuckert did not, however, share McNamara's opinions concerning the optimal structure of defense management, as became clear by the late spring of 1961. From his years in the Pentagon during the late 1940s and early 1950s, Zuckert believed strongly in the importance of autonomous and active military branches and secretariats, and he struggled against the centralizing efforts of McNamara and his staff. He argued that as Secretary of the Air Force, his primary loyalty should be to the service he represented and that his proper role was to challenge the Secretary of Defense when McNamara's policies seemed to be detrimental to the Air Force. In the bitter battle over the B-70, for example, Zuckert staunchly supported the Air Force's position against equally uncompromising opposition from McNamara and his advisers. This was not compatible with McNamara's view that the service secretary was, in Alexander Flax's words, "his [i.e., McNamara's] manager for the Air Force part of his organization."[422] Also, Zuckert did not share McNamara's predilection for systems analysis and, in fact, harbored deep suspicions of Charles Hitch and the "defense intellectuals" from RAND.[423] As a result, friction mounted between Zuckert and McNamara and, by May, 1961, the Secretary of the Air Force was contemplating resignation.[424]

Instead of resigning, however, Zuckert chose to continue championing his service's interests against the OSD despite his tenuous position between the irresistible McNamara and the immovable Air Force. His first move was a risky one. In May 1961, Zuckert decided to replace Air Force Chief of Staff Thomas D. White with the only man he thought could match McNamara's zeal for control, General Curtis E. LeMay. LeMay was a rough, outspoken advocate of air power who, throughout most of the 1950s, commanded the U.S. Strategic Air Command—the most potent military force in history.[425] LeMay was, according to Zuckert, the last of the World War II superstars, and embodied the swaggering confidence of the youngest service's early years.[426] Looking back on his decision, Zuckert sounded like a baseball manager who chose to relieve a flagging starting pitcher for a hard-throwing closer:

> I sensed fatigue in Tommy White. . . . We were losing our battle with McNamara and I felt we needed a change, to try to get back to playing winning ball. . . . I was tired of losing all the time. The first spring with McNamara was a devastating experience. We did not hit a loud foul all spring.[427]

With LeMay in the game, Zuckert hoped that the Air Force could regain the initiative and more effectively defend its traditional autonomy in planning and policy-making. When Zuckert took to McNamara his decision to relieve White and elevate LeMay, the Secretary of Defense was clearly less than enthusiastic. McNamara nevertheless recognized that LeMay's long-time leadership of the Strategic Air Command, his position as Vice Chief of Staff, and his powerful congressional supporters virtually prohibited his vetoing Zuckert's move.

During the summer and fall of 1961, Zuckert and LeMay worked to reassert Air Force prerogatives and staunch the flow of authority towards the OSD. Immediately they sought to draft stringent new guidelines for Air Force control over the activities of the nonprofit research organizations it supported, especially the RAND Corporation. The extensive role played by RAND methods and RAND personnel in the McNamara "revolution" dismayed Zuckert and LeMay. That, through RAND, the Air Force had forged the weapons of its tormentors was painfully obvious. To quell this waywardness, Air Force leaders issued the so-called Zuckert Directive on 22 September 1961, which imposed even greater service control over RAND and sent RAND-Air Force relations into a tailspin. Drafted largely by LeMay and his staff, the two-page document reflected both his and Zuckert's frustration with RAND's deepening relationship with the Office of the Secretary of Defense.[428] The second and third paragraphs of the Zuckert Directive established Air Force control over the research programs of its affiliated nonprofits and were aimed explicitly at RAND:

> Procedures must be developed to require [Air Force-sponsored nonprofit corporations] to coordinate with the Air Force before undertaking assignments from other government agencies or commercial sources.
>
> It follows, moreover, that the business aspects of their affairs must be open to Air Force scrutiny, much as an actual Air Force operation.[429]

The Zuckert Directive was designed to draw a line in the sand across which RAND and other Air Force-sponsored nonprofits would not be allowed to cross. If they were to continue under Air Force sponsorship, they must consider themselves largely extensions of the Air Force and subject to its oversight and control.

During these months, Zuckert and LeMay also set in motion "Project Alamein"—a broad review, by the Air Force, of the national security effort that emphasized the organizational relationships between and responsibilities of the civilian and military elements. The official overview for Project Alamein states,

> The Defense structure now provided for by law is based on the premise that the Departments/ Services—and the military men they produce—are necessary to the formulation, as well as the implementation of a sound, realistic national security policy. Today, the role of the Department/Service and of the professional military is deteriorating. We need a review of direction and, if justified by national security considerations, a plan for corrective action.[430]

The centerpiece of this project was a series of top-level meetings held at Homestead Air Force Base, Florida, in December 1961, intended, in Zuckert's words, "to find out what was wrong with the way the Air Force was doing business vis-à-vis McNamara and the Office of the Secretary of Defense" and "just what the hell we could do."[431]

In laying the groundwork for the Homestead meetings, Zuckert and LeMay identified the centralization of control and policy-making in the OSD as not only a challenge to the Air Force, but a fundamental threat to national security. Zuckert's memorandum inviting participants to Homestead linked the ongoing changes in defense management to the Symington Committee's recommendations and stressed his belief that, given Secretary McNamara's personal energy and dedication, the trend toward centralized control was only just beginning unless effective countermeasures were taken.[432] As such, he identified the objectives of Project Alamein to be a conceptual analysis and basic policy statement, "under the subject of 'DOD Organization as it Affects the Air Force,'" which would be the foundation for Air Force countermeasures and could be drawn upon for purposes including the preparation of relevant congressional testimony. Such a policy statement would incorporate discussions of issues and principles of national security organization and management and would concentrate on the consequences of civilian control in these areas.[433]

Participants in the Homestead meetings quickly reached consensus that the Air Force was being affected by fundamental changes in the national security structure and that national security interests demanded corrective action. They argued that "the real future of the Air Force is in serious doubt," and could no longer be ensured by Air Force control of strategic nuclear forces.[434] However, no equally clear agreement was achieved on the specific tactics that might best pursue that correction. In general, Air Force leaders and their advisers recognized that effective remedial action had to be sensitive to factors such as military operational demands, administration policy, and political developments. To further service interests in this complex environment, the group set down a series of fundamental goals, including the maintenance of service identity, resistance to centralized direction and control, adequate and timely military participation and advice in the decision making process, and the implementation of legally mandated civilian control without civilian assumption of operating functions. As means for working towards these objectives, the Homestead group suggested strengthening the "voice" of aerospace power—presumably by leveraging the influence of congressional allies and conducting public relations efforts—the invigoration of the Joint Chiefs of Staff (JCS) organization, and reduction of the OSD superstructure. At the same time, they recognized that the PPB system's institution represented a long-term alteration in Department of Defense resource allocation procedures. Thus, the Air Force had to bolster substantially its internal systems analysis capabilities so as to combat the intrusions of the OSD Whiz Kids. This, they believed, might level the field of combat on which the struggle for control had been joined. Over the next few years, the service worked correspondingly to increase its "blue suit" analytical capabilities, forming or expanding numerous analytical groups throughout the Air Force structure.

The conclusions of the Homestead group were disseminated throughout Air Force leadership at the subsequent commanders' conference in Honolulu, Hawaii, and served as the basis for ongoing efforts to resist the implementation of centralized defense management throughout Eugene Zuckert's tenure. As these efforts continued, however, Zuckert found his position in the McNamara administration progressively less tenable, and he finally resigned in the summer of 1965. Upon stepping down, Zuckert published an article in Foreign Affairs that lamented the centralization of defense management and argued for the continuing importance of autonomous military departments.[435] Zuckert's successor was Harold Brown, formerly the Director of Defense Research and Engineering and a member of the Whiz Kids, who not surprisingly concentrated on

further elaborating the deployment of PPB and systems analysis in the Air Force. Brown's ascendance to the Air Force secretariat had profound implications for RAND.

By 1965, McNamara and his OSD staff had implemented an elaborate management system that while producing considerable controversy had decisively centralized authority within the Department of Defense. This implementation of PPB and systems analysis had been greatly facilitated by the inherent nature of the defense organization; no executive department within the federal structure of the U.S. government was as well-suited to the adoption of PPB as was the military environment of the DOD. First, despite their relative autonomy, the military branches are profoundly hierarchical in both structure and culture. Even before McNamara's tenure began, the organizational character of the Department of Defense more closely resembled that of an American industrial corporation than any other federal department, a circumstance that greatly simplified McNamara's task. Indeed, he remarked of the Ford Motor Company and the Department of Defense, "the administration problems are very similar."[436] Also, the considerable technical content of defense problems, especially concerning weapons analyses, made them especially amenable to precise measurement and quantitative comparison. Cost-benefit analyses could thus be performed with considerable confidence. Finally, the application of economic theory to defense management problems was made manageable by the relatively simple output of the defense establishment: security. While "security" is certainly not an easily quantifiable commodity, it can be equated, theoretically, with the economic notion of "utility" such that general economic theory can be translated rather directly into theoretical defense economics. This is far trickier when PPB and systems analysis are applied in social welfare arenas such as education, where the desired "outputs" are politically contested. In her critique of the use of systems analysis in public policy-making, Ida Hoos comments, "the Department of Defense, in contrast to other sectors of government, has provided 'an abnormally easy place' to apply the techniques of program budgeting, cost-effectiveness analysis, and systems analysis."[437] Still, the apparently triumphant implementation of RAND's analytical methods in the Department of Defense made their further dissemination to non-defense policy making seem attractive. In the next chapter, we will see how RAND's national security methods profoundly shaped President Lyndon Johnson's "Great Society" social welfare programs – the programs that still form the foundation of American social programming.

Back to Table of Contents

Chapter Six
From the Pentagon to the Great Society

The 1960s were years of enormous change for both American society and American government. Whereas the nation had experimented with large-scale federal intervention in social welfare and stability during the crisis of the Great Depression, post-World War II prosperity curtailed the apparent urgency of the New Deal initiatives, and the onset of the Cold War shifted policy-making attention towards international events. Correspondingly, the role of the national government in improving the social welfare for the poorest citizens seemed to recede considerably. For some, the Eisenhower years are looked upon with nostalgia—something of a "golden age" when workers' incomes rose steadily, suburbanization flourished, and American society achieved stability unknown since the 1920s. Still, fundamental changes were underway during the 1950s that caused astute observers deep concern. One of these was the enormous growth of the U.S. national security establishment and its progressive penetration of American society. In 1956, for example, C. Wright Mills[438] published The Power Elite, a book that argued that a militarization of American society was concentrating power in the hands of a small but powerful elite.[439] Mills argued that the ascendance of this select brotherhood was subverting basic national principles such as open, democratic governance. More unsettling was President Dwight Eisenhower's farewell speech in January 1961, in which he warned the American people of the rise of a military-industrial-scientific complex and the dangers of government by a scientific-technical elite.[440]

Indeed, during the late 1940s and 1950s, the United States had for the first time supported the peacetime existence of a huge military establishment. This sharp divergence from tradition grew directly from the ongoing Cold War confrontation with the Soviet Union—a tense struggle that pitted contrasting and apparently irreconcilable social and economic systems against one another. The RAND Corporation was a product of that confrontation, and as we have seen, its research agenda and output were geared directly to American Cold War-making. While RAND's role in postwar national security is widely recognized, RAND's extensive influence on U.S. social welfare policy is less clearly understood. Although the RAND Corporation did not diversify from national security into social welfare research until 1966, RAND played a fundamental role in shaping the character and trajectory of American national social policies and programs. The present chapter explores the diffusion of RAND's decision-making methodologies from the Pentagon into the social welfare programs initiated by President Lyndon Johnson as components of his "Great Society," and it argues that the origins and elaboration of the Great Society, and particularly the "war on poverty," cannot properly be understood outside of the Cold War context. While this chapter does not focus on events at RAND, it demonstrates that RAND's defense-sponsored methodologies shaped the American social welfare programs of the 1960s and beyond.

The Great Society and the Cold War

The mid-1960s witnessed the single greatest expansion of social welfare programming by the U.S. government in national history, yet historians have still to understand the forces that stimulated this almost explosive growth. In his 1978 book, Politics and the Professors: The Great Society in Perspective, Henry J. Aaron outlines what has come to be the "common view" concerning the origins of the mid-1960s social welfare policies.[441] Amalgamating press, television, interpretive magazine, and journal accounts, Aaron finds this "common view" to be

founded on the notion that a small group of political liberals, who gradually developed an agenda for reformist social programs during the 1950s, gained access to high government positions with the election of President John F. Kennedy in 1960. Once in office, these liberals promoted a set of programs in education, health care, housing, and employment that would later become known as the War on Poverty and the Great Society. Throughout most of the Kennedy administration, however, the ambitions of this group were frustrated as Kennedy carefully nurtured his fragile election mandate by advocating only a fragment of the liberals' agenda and then sponsoring these only half-heartedly. According to the "common view," this course of events was suddenly shaken when Kennedy's assassination combined with growing public sympathy for black civil rights efforts in 1963 to create a deep but fleeting national remorse. The new President, Lyndon Johnson, was a man of extraordinary political sensitivity and seized this moment to fulfill an ingrained "obsession" to perpetuate Franklin D. Roosevelt's reforms.[442] Acting with a speed and energy that virtually prohibited either political resistance or reasoned thought, Johnson and his staff declared war on poverty and launched a blizzard of ill-conceived social programs. Over the long run, these programs amounted to little more than throwing vast sums of money at intractable social ills and, because of their irrational design, actually exacerbated rather than alleviated the problems they were intended to address. Or so goes the "common view."

Clearly, however, the American public was not clamoring for a "war on poverty" in 1963. Despite pockets of stunning economic despair, especially in Appalachia, the rural South, and the inner cities of the industrial North, it did not seem likely that those areas would soon become the focus of the national policy agenda. According to virtually all aggregate economic measures, the early 1960s was a time of exceptional prosperity in American history—quite unlike the years that stimulated Franklin Roosevelt's New Deal. As Robert H. Haveman remarks,

> [E]xcept for general concern with the social status and economic position of blacks generated by the civil rights movement, there was no organized interest group demanding new programs for the poor. Nor had the platforms of the major political parties assigned this problem particularly high priority. And there was no apparent surge of public opinion designating poverty to be the primary domestic policy priority.[443]

Indeed, very few scholars had engaged social welfare issues with earnest, as is evidenced by the fact that a complete bibliography of poverty-related academic studies compiled by Robert Lampman[444] in the early 1960s ran to less than two pages.[445]

Still, President Lyndon Johnson did launch his "Great Society" with considerable fanfare in early 1964, following preliminary planning that began late in John Kennedy's abbreviated administration. While the jumble of factors frequently cited as the stimulus for these social initiatives must be considered, the establishment of the Great Society programs cannot be properly understood outside the context of Cold War developments during the late 1950s and early 1960s. From their privileged perspective, RAND's intellectuals discerned a shift in the nature of the U.S.-Soviet confrontation. RAND strategists and policy analysts began to worry that as the two global powers reached nuclear stalemate, the Soviet Union would be able to employ its perceived superiority in conventional armaments to conduct "nibbling" incursions around the periphery of the capitalist bloc. With de-colonization proceeding apace, vast areas of the globe lay vulnerable to communist ambitions while anti-imperialist nationalism provided a rousing ideology for social revolutionaries across the "underdeveloped" regions of Africa, South Asia, and Latin America. In these "third areas," American policy-makers worried, widespread social ills such as disease, poverty, racism, and unequal wealth distribution easily could be converted by clever communist propagandists into powerful destabilizing forces.

As the Cold War entered this new and dangerous phase, U.S. leaders also could see emerging patterns of social instability on the home front. Daniel Moynihan[446] writes that in 1963, "It was just barely beginning to be perceived that social conditions in the slums of the large cities were inching towards instability."[447] That year witnessed the televised brutalization of African-American protesters by white authorities in Birmingham, Alabama, the first urban riots in New York City, a massive civil rights march on Washington in August, and a series of bombings in September. Meanwhile, the plight of America's black population provided rich fodder for Soviet propaganda in the contest for the favor of emerging nations. A 1962 RAND study entitled, "Political Side Effects of the Military Assistance Training Program," for example, warned that in bringing foreign trainees to the U.S. South, "there is no denying that the racial problem is one that must be faced and that its negative effects must be guarded against."[448] By then, dangerous confrontations in Berlin and Cuba with the increasingly aggressive Soviets indicated to Kennedy administration officials that war might lie just beyond the horizon. In such unsettled and dangerous times, these officials may have wondered whether U.S. *domestic* social unrest was becoming a threat to national security.

Certainly, conceptualizations of national security were increasingly intertwined with issues of social welfare and stability. At RAND, for example, studies performed for the Office of the Secretary of Defense increasingly blurred the distinctions between national security and social welfare research. As early as 1960, for example, RAND performed research of comparative black and white attitudes towards the U.S. government under Project AGILE funding from the OSD's Advanced Research Projects Agency.[449] Project AGILE was ARPA's program of research on counterinsurgency in Southeast Asia. Under this funding, RAND staff members Harvey A. Averch and John E. Koehler conducted a statistical analysis of differences between blacks' and whites' lifestyles, philosophies of life, and attitudes toward the American social system. They found the attitudes of African-Americans to be far more pessimistic on all counts. Averch and Koehler surveyed 100 African-American and 866 white urban residents to divine their collective attitudes on such issues as whether they believed they would receive unbiased treatment from either the government or the police, whether government officials considered their views, how likely they were to participate in protest demonstrations, and whether they believed human nature to be fundamentally cooperative or not. On one count, for example, the RAND social scientists found that sixty-four percent of blacks thought no one cared about them. The Department of Defense was concerned that the same social ills that provided a breeding ground for rebellion in Southeast Asia might also be found in urban America.

Connections between national security and social welfare led a growing number of RAND's staff members to support the diversification of RAND's research agenda beyond overtly military matters. Many factors drove RAND's decision in 1966 to undertake social welfare research in addition to its national security work, and the interplay of those factors is the focus of this book's Part III. One of those factors was the emerging sense that domestic policies and national security were intertwined. For example, RAND staff member Paul Armer wrote in a memorandum to president Frank Collbohm, "If anything has become clear to me in the course of my recent experience with international and domestic situations, it is that there is an interrelationship between the way we conduct ourselves at home and our standing and influence abroad, and this interrelationship has begun to shape our fate as a nation."[450] One of the key figures in the implementation of the Johnson's Great Society program, Adam Yarmolinsky, wrote to fellow Johnson staff member Hays Redmon of the prospective war on poverty:

> It is one of our most effective tools in the war against Communism. Democracy can grow neither at home nor abroad in the shadows of hopelessness and deprivation. Our

international stature will be immeasurably enhanced if we succeed in becoming the first great nation to enter the anti-poverty race.[451]

In light of such statements by senior policymakers, historians must consider seriously the question of whether the "Great Society" or the war on poverty would have been pursued in the absence of the Cold War. Certainly many security policy specialists, both inside and out of RAND, increasingly made connections between American domestic and foreign policy during the 1960s. The remainder of this chapter will discuss the implementation of Lyndon Johnson's social welfare agenda, especially the war on poverty, and the means by which it was further shaped by the Cold War defense management methods developed at RAND and instituted during the "McNamara revolution."

Origins of the War on Poverty

When President Lyndon B. Johnson declared war on poverty in his first State of the Union address in January 1964, work on the proposed program had been underway in the White House for less than three months. As was noted above, scholarship concerning poverty was rudimentary, and government policy-makers, including those at the highest levels, had only the sketchiest appreciation for its extensiveness or causes. According to Daniel Moynihan, then Assistant Secretary of Labor for Policy Planning and Research, the first official document to set forth the need for a "coordinated attack" on poverty was a Council of Economic Advisors (CEA) staff memorandum dated 29 October 1963.[452] The next day, Walter W. Heller,[453] chairman of the CEA, wrote members of the cabinet asking for proposals that "might be woven into a basic attack on poverty and waste of human resources, as part of the 1964 legislative program."[454] In the meantime, Heller established a special task group, constituted mainly of CEA members, officials from the Bureau of the Budget, and White House staffers, to weigh alternative strategies and construct a plan of action for the 1964 legislative campaign.

In academia by late 1963, the outlines of three distinct conceptualizations of poverty had emerged and would continue to provide the framework for scholarship in this area: the culture of poverty, the dysfunctional social system, and the dysfunctional economic system.[455] According to the "culture of poverty" perspective, the poor are inheritors of a subculture characterized by deviant behaviors, values, and focal concerns; the ramifications of this subculture determine their socio-economic position. The poverty subculture constitutes a self-generating "vicious circle" transmitted to children at an early age in which the pattern of socialization prohibits escape. To eliminate the poverty subculture, according to this body of thought, the poor must be assimilated to middle class or working class values through directed culture change, social work, psychiatric therapies, and compensatory education.[456]

Alternately, the dysfunctional social system framework holds that the poor subscribe to the cultural goals and values of the "normal" society, but that they are prevented from attaining cultural goals by some malfunctioning of the social structure. This malfunctioning may involve lack of access to the political and economic systems, systematic racial discrimination, ineffective social institutions, and other factors that also prohibit rather than facilitate full participation in the larger society. According to proponents of the dysfunctional social system perspective, poverty can only be eliminated when social structures are altered so as to permit economic opportunity and empowerment of the poor vis-à-vis the institutions that affect their lives.[457]

Finally, proponents of the dysfunctional economic system view argued that the existence of a poor class is the result of structural unemployment, inadequate income maintenance programs, and low levels of productivity. Typically, such poor are isolated from the dynamics of the

national economy and can only be assisted through the creation of adequate income maintenance programs and what have come to be known, more recently, as "trickle-down" economic policies aimed at expansion of the economy and its attendant benefits.[458]

In constructing a strategy for the war on poverty, White House officials could draw on experience in combating poverty gained primarily through the Ford Foundation's "Grey Areas" programs, a New York City nonprofit community action organization known as Mobilization for Youth, and the work of the Kennedy administration's President's Committee on Juvenile Delinquency and Youth Crime (PCJD). The Ford Foundation's "Grey Areas" programs began in the late 1950s as the head of the foundation's Public Affairs Program, Paul N. Ylvisaker,[459] became disenchanted with the urban renewal projects that were ongoing at the time.[460] Ylvisaker argued that "dealing with cities as though they were bricks without people" was counterproductive, and he began looking to use his fund to support new and broader approaches to the social as well as the physical problems of the urban "grey areas." With the assistance of Edward Logue,[461] the Director of Redevelopment in New Haven, Connecticut, Ylvisaker designed the Grey Areas grants not just to assist in the provision of social services, but rather to transform the political and social life of the community through new community organizations that would coordinate programs in areas such as youth employment and education. The new breed of "community action agencies" spawned by the Ford Foundation Grey Areas program represented an innovation in social welfare policy that would have profound implications for the later war on poverty. According to Moynihan,

> The Ford Foundation . . . purposed nothing less than institutional change in the operation and control of American cities. To this object it came forth with a social invention of enormous power: the independent community agency. In effect, the Public Affairs Program of the Ford Foundation invented a new level of American government, the inner-city community action agency.[462]

By 1963, Ford grants had been awarded to Oakland, California, New Haven, Boston, Philadelphia, and, in that year, a statewide program was initiated in North Carolina. Altogether, these five projects had, by then, been awarded a total of $12.1 million.

Mobilization for Youth, Inc., (MFY) was similar in many respects to the Ford Foundation Grey Areas programs except that it drew sponsorship from not just the foundation but from the City of New York and the federal government. The planning for MFY began in June 1957, when the board of directors of the Henry Street Settlement, on the Lower East Side of Manhattan, determined to take action in the face of rising youth crime in the area. MFY was founded as a nonprofit community action corporation composed of representatives from various agencies and institutions on the Lower East Side of New York City and persons recommended by the New York School of Social Work at Columbia University.[463] The organization had as its focus the constellation of problems associated with juvenile delinquency, and its active membership quickly adopted as a theoretical guide the "opportunity theory" of delinquent behavior developed by Richard A. Cloward[464] and Lloyd Ohlin[465] in their book Delinquency and Opportunity, which focused on the alienation of youth from the broader community.[466] The MFY program stemmed from more than four years of planning by participants who produced a voluminous 617-page report published in December 1961, A Proposal for the Prevention and Control of Delinquency by Expanding Opportunities.[467] By then, the destiny of MFY had been closely tied to both the Ford Foundation and President Kennedy's new President's Committee on Juvenile Delinquency and Youth Crime. When the MFY project was formally launched with a ceremony in the White

House garden on 31 May 1962, its three-year, $12.5 million grant was funded by Ford (15 percent), New York City (30 percent), and the federal government (55 percent).

The President's Committee on Juvenile Delinquency and Youth Crime (PCJD) was a crucial institutional conduit of ideas from the Ford Foundation Grey Areas programs and the MFY into the executive offices of the federal government.[468] Within weeks of the 1960 election, Attorney General Robert F. Kennedy[469] had appointed his boyhood friend David Hackett, who had served as an important campaign aide, as special assistant to the Attorney General with the task of studying the problems of juvenile delinquency. Hackett had no experience in this area, but he enlisted the assistance of scholars and social workers already active in the field. One of his first contacts was with representatives of the Ford Foundation, including Dyke Brown, a senior executive, and David Hunter, who was responsible for MFY affairs at Ford.[470] Following a series of meetings, Hackett hosted a meeting of experts on 16 March 1961 to discuss problems and potential alternative strategies, the discussion paper for which was written by Ford's David Hunter.[471] The ideas of the Ford programs, especially the notions of "dysfunctional social structures" and "opportunity theory" espoused by Cloward and Ohlin, dominated the March conference.

On 11 May 1961, President Kennedy sent a message to Congress that reported increasing juvenile delinquency and announced the formation of the President's Committee on Juvenile Delinquency and Youth Crime to find solutions. David Hackett became the Executive Director of the PCJD, and its membership included Lloyd Ohlin and Richard Boone, a member of the Ford Foundation's Public Affairs Department. Accordingly, the PCJD internalized the dysfunctional social structures perspective of poverty, and its work focused on the role of social institutions and structures in perpetuating delinquency among lower class youth. Soon, the committee had awarded grants amounting to $30 million to Mobilization for Youth and to organizations in a dozen other communities for developing comprehensive plans of community organization to attack the causes of juvenile delinquency.[472] Thus, by mid-1961, the PCJD and the Ford Foundation were pursuing parallel paths in their social welfare efforts and providing a basis of experience for any future expansion of federal programming efforts. At the same time, the energetic work of the PCJD attracted considerable attention, and its members became well-known in government circles as the "urban guerrillas."[473]

Further, the Ford Grey Areas programs produced the notion of "community action," which was to find its way to the core of the Great Society.[474] The philosophical predilections of these two agencies toward the "dysfunctional social structures" model of social problems led them to focus their attention on the transformation of local social institutions and the encouragement of involvement by the poor in those institutions. According to Sanford Kravitz, program coordinator for the PCJD, the perceived need for community action arose from the identification of a specific set of problems:

1. Many voluntary "welfare" programs were not reaching the poor.
2. If they were reaching the poor, the services offered were often inappropriate.
3. Services aimed at meeting the needs of disadvantaged people were typically fragmented and unrelated.
4. Realistic understanding by professionals and community leaders of the problems faced by the poor was limited.
5. Each specialty field was typically working in encapsulated fashion on a particular kind of problem, without awareness of the other fields or of efforts toward interlock.
6. There was little political leadership involved in the decision-making of voluntary social welfare.

7. There was little or no serious participation of program beneficiaries in programs being planned and implemented by professionals and elite community leadership.[475]

Richard Boone recalled that during this period, local community representatives brought to Washington to meet with the PCJD frequently repeated the same comment, "For God's sake, quit planning for us. If you really want us involved, then don't play games with us."[476] As such, the program efforts of the PCJD and Ford explicitly pursued the objective of local involvement in program design and execution and community participation in institutional change.

Immediately following Kennedy's assassination, President Johnson informed Walter Heller, chairman of the Council of Economic Advisers (CEA), that he intended to follow through with the former leader's planned federal assault on poverty. The Bureau of the Budget (BOB) set aside $500 million to finance the antipoverty program and a joint task group of CEA and BOB representatives began to devise the contours of a legislative agenda. Surveying the situation, the CEA/BOB group recognized that in addition to new programs that might be created, the federal government already had in place a considerable number of programs that might contribute to a more systematically organized war on poverty. However, these were scattered across the federal bureaucratic structure and enjoyed no semblance of coordination or central direction. Moreover, the CEA/BOB group was dismayed by the lack of scholarly agreement as to what an appropriate strategy against poverty might be. William Capron,[477] a member of the CEA/BOB team recalled,

> We were groping for some way to make the existing money in the budget focus. . . . [W]e were bewildered by the complete disarray of the nominal professionals in the field of poverty. All kinds of social scientists, practicing social workers and the like did not seem to agree on the diagnosis; they certainly didn't agree on the cures. It was quite clear that poverty had . . . many faces, that to talk of some cutoff below which everyone was a glob had no programmatic meaning at all because you were talking about widely disparate groups, and that a single magic answer was not to be found.[478]

As Moynihan comments, "Order and efficiency are the passions of lawyers and economists," and the CEA/BOB team began looking for a means to coordinate the antipoverty programs.[479]

In the course of this search, the BOB solicited the advice of PCJD Executive Director David Hackett, who wrote two memoranda to the CEA/BOB group. These and subsequent meetings with Hackett and Richard Boone convinced William B. Cannon,[480] a key BOB staff member, that locally organized nonprofit community corporations could be used as a coordinating mechanism. Cannon enlisted the support of Assistant Budget Director Charles L. Schultze[481] and other staff members and outlined his ideas in a memorandum dated 12 December 1963. In it, he proposed

> the establishment of a series of State and Local Development Corporations, which would develop a plan, to be approved by the President, to conduct action demonstration and testing programs simultaneously in 10 poverty areas. . . . The Development Corporations would involve local communities in the design of systematic, local planning for its own self-help, and, out of this experience, developing recommendations for a longer-term program for an attack on poverty which would form the basis for legislative and administrative actions that need to be taken by the various levels of Government."[482]

According to Cannon's scheme, the nonprofit "development corporations" would choose from the menu of available federal and state programs to construct a locally relevant program strategy and expend their allotted funds according to that plan. This meant that, despite their

inherently decentralized nature, the corporations would provide a manageable coordinating mechanism for the welter of social programs. Furthermore, this strategy would create something of a "market" for federal programs in which local groups would "shop" for the most attractive and effective. This approach offered to soothe the ingrained concern among the BOB economists that public resource allocation suffered from its insulation from beneficial market forces.

On 17 December, Charles Schultze endorsed Cannon's ideas in a memorandum to Budget Director Kermit Gordon,[483] arguing that "there are some 35 pending or proposed new programs which relate quite directly to the attack on poverty. There are, of course, a number of existing programs which also fit into this category. There is a tremendous need to plan and coordinate these programs on a local and regional basis."[484] Yet, Gordon was unswayed. The Budget Director was wary of such a profoundly decentralized plan, and he recognized that his staff neither fully understood the programs they proposed nor anticipated their possible political ramifications. According to William Capron, "he quite rightly could say to people like Cannon, Schultze, and Capron, 'You guys really don't know what you're talking about'—which was true."[485] The proponents would not be dissuaded, however, and they arranged a lengthy breakfast meeting between Kermit Gordon and Paul Ylvisaker of the Ford Foundation, an advocate of community-based social welfare planning.[486] Ylvisaker brought along Mitchell Sviridoff and George Esser, two of the foundation's top community action officials, and was "at his most persuasive."[487] After this late December 1963 meeting, Gordon eased his resistance to the plan, which by then had assumed its permanent designation, the Community Action Program (CAP).

Whereas in early December 1963 the CEA/BOB group proposed to devote to CAPs $100 million of the $500 million allotted to the antipoverty program, by January, when they presented their legislative strategy to President Johnson, CAPs formed the entirety of the BOB antipoverty plan.[488] Even at this early date, however, the PCJD officials who developed the CAP ideas and the BOB staffers who adopted them diverged in their understandings concerning the CAPs' purpose. On one hand, the BOB officials saw CAPs as a mechanism for coordinating antipoverty efforts. In their understanding, CAPs created a discrete set of focal points at which federal program officers could work directly with local political and community leaders and oversee program design and implementation. At the same time, the CAP structure permitted circumvention of the existing tangle of city, state, and federal bureaucracies such that meaningful, effective programs could be enacted. According to James Sundquist,[489] who was then Deputy Under Secretary of Agriculture, "It was certainly never thought that the poor themselves would play a substantial role in developing and administering the [community action] program."[490] Indeed, President Johnson believed that local or state governments rather than private non-profit corporations would control CAPs—a misunderstanding that lasted until after his antipoverty legislation passed Congress in August 1964.

However, the members of the PCJD, especially David Hackett, Richard Boone, and Frederick Hayes who remained active in the formulation of the antipoverty program and would draft much of the eventual CAP legislation, had a very different perspective on community action. They saw the CAPs as a means to reintegrate the poor into the broader social structure and thereby break down the walls of alienation that trapped them in the poverty subculture. While it is unlikely that they foresaw an active role for the poor in policy-formulation, they advocated "maximum feasible participation" in the community programs as a means to catalyze the correction of dysfunctional social structures. Crucially, neither the BOB nor the PCJD officials produced detailed plans by which their rather abstract notions of the CAPs would be operationalized. As such, neither of the groups was aware that its conceptualization of the CAPs was at variance with that of its counterpart.

Despite these divergent understandings of the CAP proposals, Lee White, then Assistant Special Counsel, drafted an outline of specifications for Johnson's antipoverty bill in a memorandum to the cabinet secretaries and executive agency heads on 21 January—specifications which equated that bill with the Community Action Program.[491] This memorandum quickly stimulated resistance to the BOB plan as the various executive agencies demanded pieces of the funding for their own programs, and the antipoverty plan threatened to dissolve into chaos. To avert this, President Johnson appointed Sargent Shriver,[492] on 1 February 1964, to head a Task Force on Antipoverty Programs, charged with designing a detailed legislative package that would be sent to Congress and lay out plans for its implementation.

Shriver immediately tapped as his deputy Adam Yarmolinsky, Secretary of Defense McNamara's Special Assistant, and met on 2 February with CEA and BOB representatives who explained the idea of community action. To their dismay, Shriver reacted unfavorably to the idea. Shriver had little faith in the planning capabilities of local organizations and, according to Yarmolinsky, argued, "Where you need the money worst, you'll have the worst plans."[493] Shriver held a second meeting the next day, at which the BOB proponents again presented the CAP proposals. Daniel Moynihan, an attendee of this meeting, recalled,

> Charles Schultze explained that projects would be initiated at the local level, with a measure of federal prodding, and approved at the federal level. William Capron touched on the problem of local leadership in the South, especially, and noted that CAP's could be used to bypass the local "power structure" with the use of Federal funds. Richard Boone insisted that the community action programs could be "manned" by the poor themselves.[494]

Shriver, however, remained unconvinced for several reasons. First, he was in close contact with Robert McNamara throughout this process and leaned heavily on advice the Secretary of Defense offered. Adam Yarmolinsky recalled, "naturally I was discussing the [social welfare] program with McNamara in the early days and going back to Shriver and discussing what McNamara and I had come out with and what McNamara was saying, and McNamara's views naturally were persuasive with Shriver."[495] Given Secretary McNamara's experience at the Ford Motor Company and his embroilment in an effort to centralize the defense administration, he was appalled by the decentralized structure embodied in CAPs. Also, Shriver continued to look with disfavor upon the direct involvement of local residents. On 13 February, William Cannon wrote to Kermit Gordon and Walter Heller, "Shriver still appears to be highly distrustful of the willingness or ability of local people to do a proper job."[496] Finally, the best time frame that could be offered Shriver for positive results from CAPs was one year—a horizon that prohibited any impact on the upcoming presidential election or, as Moynihan notes, the selection of a presidential running mate.[497] As a compromise solution, in a meeting on 23 February Shriver and Yarmolinsky decided to retain the Community Action Program as the largest of five "titles" to be incorporated in the antipoverty legislation. As such, CAPs would be implemented in the Economic Opportunity Act that was introduced to Congress on 16 March 1964 and signed into law on 20 August, but they were no longer the be-all and end-all of the administration's strategy. Ironically, no one would be more thankful for this than the BOB staff members who had championed the plan.

The BOB staff's subsequent regret of the CAPs was due, in large part, to language included in the final drafting of the Economic Opportunity Act's Community Action Program section (Title II), which called for "maximum feasible participation" of the poor in the programs that affected them. In part, this language was intended to provide a mechanism through which federal

assistance could be extended to poor African-Americans in the South despite the resistance of white-dominated institutions. Indeed, this was the manner in which the language was interpreted by many of Shriver's task force members.[498] However, the authorship of Title II indicates that it also was intended to shape the implementation of CAPs in northern urban areas. Title II was written in late February 1964 by Harold Horowitz, Associate General Counsel at the Department of Health, Education and Welfare (HEW), with the assistance of Richard Boone, Frederick O. Hayes, and David Hackett—key members of the PCJD urban guerrillas and advocates of the "dysfunctional social structures" perspective on poverty. These individuals likely saw this language as assurance that the poor would participation directly in poverty programs and thus overcome the alienation from social institutions that had historically trapped them in a cycle of poverty. Certainly this was not the intent of Shriver and Yarmolinsky, but as Yarmolinsky recalls,

> It never occurred to us to cut it [i.e., "the maximum feasible participation" language] out. . . . [W]e accepted it without too much question. There was a whole line of development from the Ford Foundation to the President's Committee [on Juvenile Delinquency], and we figured they knew what they were talking about.[499]

Similarly, the "maximum feasible participation" clause drew virtually no attention during the congressional hearings held during the spring and summer of 1964 to consider the poverty legislation. Blumenthal notes that, "the theory of CAP was explored only superficially, and the maximum feasible participation clause was ignored entirely."[500] Indeed, the only witness who dealt substantively with the intent of "maximum feasible participation" was Robert F. Kennedy, under whose direction the concept had been developed by the urban guerrillas. Kennedy testified,

> The community action programs must basically change these [local social] organizations by building into the program real representation of the poor. This bill calls for maximum feasible participation of the residents. This means the involvement of the poor in planning and implementing programs; giving them a real voice in their institutions.[501]

Kennedy's testimony drew no scrutiny from its audience, perhaps in deference to a man who remained so deeply and obviously shaken by his brother's recent assassination. In any case, the months of hearings in the Capitol failed to expose the basic anomaly of the CAP legislation—that the intentions of its authors were largely contradictory to those of its sponsors.

Even this incongruity, however, might not have led to incident had the southern Democratic congressional delegation failed to play its invariable role as a political wildcard. As the Economic Opportunity Act neared passage, Sargent Shriver was certain to assume the directorship of the new Office of Economic Opportunity, and most observers assumed that Adam Yarmolinsky would be appointed deputy director. Yarmolinsky had served as Shriver's second-in-command during both the 1960 presidential campaign and the 1964 formulation of the antipoverty program.[502] Yet, in a meeting in the office of the Speaker of the House on 8 August, the members of the North Carolina delegation demanded as the price of their support a pledge that Yarmolinsky would have nothing to do with the administration of the poverty program.[503] As McNamara's special assistant, they complained, Yarmolinsky had defended the civil rights of black servicemen in southern states, and he was generally held in suspicion due to his "liberal" views. Furthermore, Yarmolinsky was known to drive a Volkswagen and, periodically, to sport a beard—further indications of his subversive tendencies. Faced with such overwhelming evidence and anxious not to lose the seven North Carolina votes, Shriver and Johnson immediately sacked Yarmolinsky and sent him back to the Pentagon.

Yarmolinsky's departure from the poverty program altered the trajectory of the Community Action Programs. As mentioned above, the language of the CAP legislation permitted a wide range of interpretations, some of which contrasted with the intentions of the program's leadership. The wording of the act neither defined "maximum feasible participation" nor specified how it was to be achieved, and it failed to ascertain the extent to which poor people would be involved in real decision-making. Yarmolinsky, like Shriver and most other high-level administration figures, was opposed to the adoption of a decentralized decision-making structure in which the poor participated directly in policy formulation. He considered the poor to be a constituency, and "A constituency, after all, need not be involved in the kind of direct democracy practiced at faculty meetings."[504] Yarmolinsky's interpretation of the CAP language was such that "in each of the communities where the [Community Action P]rogram operated, the mayor and the poor people would put together a program. . . . And we would use the availability of some of our money as a carrot to encourage the planning, but we would have the last word."[505] Thus, despite the literal formulation of the CAPs, Yarmolinsky's administration would have retained centralized control over policy-making.

However, during the summer of 1964, the character of the Urban Areas Task Force—the group appointed by Shriver to implement the CAPs—evolved such that its ideological composition began to diverge substantially from that of Shriver, Yarmolinsky, and the remainder of the White House administration. During the weeks following the submission to Congress of the antipoverty bill, the senior officials who had prepared the rudimentary design of the antipoverty legislation returned to their respective agencies and a lower ranking contingent, whose loyalties lay exclusively with the new organization, was seated. This group incorporated significant influence from a subset of poverty warriors, including Richard Cloward and others with experience in local agencies, who adopted the perspective that for CAPs to work the poor must not only participate in decision-making but should to be encouraged to express criticism and dissent.[506] Whereas David Hackett and Paul Ylvisaker supported the enlistment of the poor in CAPs, their approach stressed the formation of consensus and coalitions with an insistence on careful, systematic policy planning. Alternately, the members of the Cloward group argued that unless the poor gained real power through new institutions, the provision of additional services would only perpetuate the extant cycle of dependency and helplessness. Further, they believed that the use of systems analysis advocated by Hackett and Ylvisaker in policy formulation placed a premium on sophisticated quantitative methods which the poor were ill-equipped to understand or criticize. This meant that even if low income residents were consulted during the planning stage in public meetings or policy boards, the poor would have difficulty contributing to the dialogue concerning policy alternatives.

The more radical group had put its ideas to work in Mobilization for Youth, which began operations in 1962. There, Cloward and others experimented with rent strikes, anti-police-brutality pickets, and protests against welfare restrictions. According to Blumenthal, their methods were

> dramatically illustrated by the protest they organized in January 1964 among Puerto Rican and Negro mothers over the scarcity of school textbooks. The mothers met for several hours with the principal of the local elementary school, turning the session into a shouting contest and challenging his good faith in the press.[507]

Yarmolinsky's demise as apparent head of the CAPs in August 1964 unintentionally made way for the advocates of resident mobilization to enforce their vision of community action on the fledgling federal poverty agency. By seizing on the potentially revolutionary letter of the

Economic Opportunity Act rather than its innocuous intent, the poverty warriors threatened to introduce real democracy to federal social welfare policy-making—an eventuality that was anathema to the Cold Warriors of the Johnson administration.

The Civilianization of PPB and the Centralization of Social Policy-Making

When the Economic Opportunity Act formally instituted President Johnson's war on poverty in August 1964, the man placed at the head of the Office of Economic Opportunity's Community Action Program was Jack T. Conway,[508] then on leave as the United Auto Workers' principal representative in the headquarters of the AFL-CIO. A labor organizer from Detroit who made his reputation during the early days of the autoworkers' union, Conway had gone to Washington in 1960 as the deputy administrator of the Housing and Home Finance Agency in President Kennedy's Administration. In this role, Conway helped to draft the Omnibus Housing Act of 1961, which established the Department of Housing and Urban Development. As head of the OEO's Community Action Program, Conway sought "to structure Community Action Programs so that they would have an immediate and irreversible impact on the communities."[509] As such, he had considerable sympathy for the poverty warriors who adopted the more radical interpretation of "maximum feasible participation." Conway championed the notion of a "three-legged stool"—CAPs designed so as to involve in policy planning the three relevant segments of low income communities: private charities, public agencies, and the poor. Indeed, the CAP guidelines published early in 1965 explicitly endorsed this activist approach and stated, "A vital feature of every community action program is the involvement of the poor themselves—the residents of the areas and members of the groups to be served—in planning, policy-making, and operation of the program."[510] The goal was "the 'mobilization' of the poor" through "traditional democratic approaches and techniques such as group forums and discussions, nominations, and balloting" and with the use of films, literature, and mobile information centers.[511] Fundamentally, the CAP administrators envisioned the creation of new social and political institutions through which the poor could express their needs and participate in solutions. Thus, they interpreted the ambiguous legislation enacted by Congress as empowering them to democratize the social welfare policy-making process.[512]

Such strategies as those adopted by CAP administrators in the second half of 1964 were not, however, looked upon favorably by either the systems analysts in the Pentagon or the top-level economists of the Bureau of the Budget. The scales fell quickly from the eyes of Assistant Director of the BOB, Charles L. Schultze, who lost his enthusiasm for CAPs as a centralizing mechanism and began to perceive them as destabilizing influences under the direction of "a man of little stature and uncertain competence."[513] As Moynihan recalls, "disillusion with the 'OEO radicals,' as they came to be known in some circles at least of the Executive Office Building, was instantaneous. The Bureau had been promised coordination, and all it has seemingly got was chaos."[514] Also, the adoption of decentralized policy-making failed to conceptualize social problems as systems but concentrated instead on local solutions to locally perceived problem sets. Further, the reliance of the CAP management structure on local experience and involvement of the poor prohibited detached, rational analysis of the sort championed by the scientific analysts. They believed that persons deeply enmeshed in the social systems targeted for policy-making could neither objectively comprehend those systems nor develop unbiased policy alternatives. Finally, the empowerment of the poor threatened to undermine existing social and institutional structures. In this sense, the destabilizing implications of the CAPs ran contrary to what this book argues was a primary objective of the Great Society—the stabilization of American society. As

such, by early 1965, BOB officials were looking for a means to reassert centralized control over the new social welfare programs, and their search quickly took them to the Pentagon.

As it became apparent to BOB officials that CAPs would not provide the sort of coordinating mechanism they desired, the application of the Planning-Programming-Budgeting system to the civilian agencies as an alternative solution rapidly gained currency. The BOB had been closely involved with Charles Hitch and his staff as they created the PPB system in 1961-62 in the Department of Defense, and many top-level budget administrators were deeply impressed by the degree of control it afforded.[515] At the same time, PPB's reliance on systems analysis for decision-making placed emphasis on quantitative techniques and statistical precision—two qualities held dear by the BOB economists. Further, Sargent Shriver, the Director of the Office of Economic Opportunity (OEO), and McNamara were close friends, and the Secretary of Defense had advised Shriver that he needed a facility like the one that Charles Hitch and Alain Enthoven ran at the Pentagon—a program planning facility.[516] Taking McNamara's advice, Shriver established a program analysis office reporting directly to him and hired RAND economist Joseph Kershaw as Assistant Director for Program Coordination, Planning, Evaluation and Research. Finally, President Johnson's new Special Assistant for Domestic Programs, Joseph A. Califano, Jr.,[517] had been a member of McNamara's OSD staff from 1961 until his appointment to head the domestic programs in 1964. By his own admission, Califano's prior experience had been confined to defense, and he "knew nothing about domestic programs, nothing about social programs, and indeed, . . . hadn't even ever thought much about them."[518] However, he had been associated with the implementation of McNamara's centralized management system and could be counted on to champion a broadening of its use.

In October 1964, three members of the BOB's Labor and Welfare Division wrote a lengthy memorandum to the bureau's Deputy Director, Elmer Staats,[519] which describes the nature of the Defense Department's PPB system, the differences in implementation between the DOD and OEO, and potential problems.[520] The memorandum advised that the application of PPB to the poverty administration would require the recruitment of considerable numbers of social scientists to participate in systems analyses, that the cost-benefit approach to analyses would be more difficult in social welfare policy-making due to difficulty in measuring program benefits, and that OEO would have to compensate somehow for "the absence of any RAND Corporation in the poverty area as a starting point."[521] Nevertheless, the BOB staff members emphasized the powerful centralizing effect PPB had had on defense policy-making. They commented that before 1961 the OSD had been little more than a "rubber stamp" operation, the PPB system provided the Secretary of Defense with the information and administrative structure necessary to exercise considerable authority. They found that, "this new type of decision-making . . . appears to be the most fundamental innovation of the Hitch-McNamara era. If this is the fundamental essence of the Hitch function, then we believe it is obvious that OEO needs a Hitch-type operation."[522]

Over the winter of 1964-65 a second source of pressure magnified the desire of OEO and BOB officials to centralize control over the social welfare programs—the increasingly strident complaints of local Democratic politicians concerning the Community Action Programs' destabilizing effects. As was discussed above, an objective of the CAP administrators was to stimulate the creation of new social institutions that would permit the poor a meaningful voice in policy-making. If necessary, this meant that existing social and political structures, perceived by the poverty warriors as decrepit and unresponsive to the needs of the poor, would have to be abandoned. Furthermore, the CAP guidelines appeared explicitly to encourage program participants to engage in disruptive behavior. The first CAP program guide, for example, suggested that local organizations provide "meaningful opportunities for residents, either as individuals or in groups, to protest or to propose additions to or changes in the ways which a

Community Action Program is being planned or undertaken."[523] In fact, protest and confrontation were viewed by many CAP organizers as at least therapeutic means for the poor to vent their frustrations.

Unfortunately, these policies quickly alienated from the CAPs two traditional sources of Democratic support in the northern cities: social workers and urban political machines. In the first case, community action threatened to undermine the rationale behind the social services approach to fighting poverty—that professionals should fight the battle for poor people instead of equipping them with the means and resources to fight it themselves. Of greater long-term consequence, however, was the dissatisfaction of big-city mayors who became increasingly alarmed that CAPs were undermining existing, and largely Democratic, political structures by encouraging community residents to establish their own organizations. The first of the community organizations to come under attack was Mobilization for Youth—the model for Conway's implementation of the federal CAP.[524] On 16 August 1964, four days before the Economic Opportunity Act was signed, the New York Daily News initiated an assault on the Lower East Side community action corporation, charging that it was "infested with subversives." Before the November presidential election, pressure on MFY resulted in the resignation of the organization's director and instructions from Washington that MFY conduct all future contracting through city government departments. As the federal CAPs got underway during the winter and spring of 1965, similar protests from Democratic mayors began to pour into the White House and, as William Selover recalled, "the day the first letter of protest arrived at the White House from an aggrieved mayor was the day the administration began its retreat."[525]

President Johnson had never been favorably inclined toward CAPs and certainly never intended them to mobilize the poor.[526] In fact, he had initially vetoed the idea when it was presented to him by Kermit Gordon and Walter Heller over the Christmas holidays in late 1963.[527] As the programs swung into action in early 1965, Johnson's anxiety promptly turned to antipathy as it became clear to him that the CAPs were being run by "kooks and sociologists."[528] Being a consummate politician, President Johnson recognized that the programs were causing more problems for his friends than for his enemies and, according to Moynihan, the President confided to at least one senator that such a scheme had been tried on two occasions in Texas during the New Deal and had quickly been squelched by Franklin Roosevelt.[529] The breaking point was reached in June 1965 when the Conference of Mayors was used as a platform by Democratic urban leadership to denounce Johnson's infant social welfare programs. There, Mayors John F. Shelley of San Francisco and Sam Yorty of Los Angeles sponsored a resolution accusing Sargent Shriver of "fostering class struggle."[530] Johnson demanded that his staff find a way to rein in the programs, but, in Moynihan's words, "no one knew how to respond to the President's concerns. Save the Bureau of the Budget."[531]

Charles L. Schultze, one of the frustrated parents of the CAPs, replaced Kermit Gordon as Director of the BOB in June 1965 and immediately began working out plans to transfer the PPB system from the Pentagon to the social welfare agencies. Gordon had fortuitously provided Schultze with a knowledgeable and energetic executive officer when, during the previous January, he had hired Henry Rowen away from the OSD to serve as Assistant Director of the BOB for national security affairs.[532] Rowen, a former RAND scientific strategist and McNamara Whiz Kid, was reassigned by Schultze to begin laying the groundwork for implementation of the defense management system in the civilian agencies—a task Rowen pursued with customary relish. In Rowen's words,

> I had really gotten quite upset about the Great Society program. There I was sitting in the Budget Bureau while all this stuff was coming from across the street—the White House

> basically. . . . By then Charles Schultze had become budget director . . . and he was very skeptical of a lot of this too. It wasn't that I was the only one who thought that this presented some real problems.[533]

Over the summer of 1965, Schultze and Rowen pulled together a plan for instituting PPB in the civilian agencies of the federal government. According to the design they presented to Joseph Califano, the President's Special Assistant for Domestic Programs, each department would draw up a basic multi-year program (a five-year plan was suggested) which established specific goals and objectives.[534] To accomplish this, each department or agency would create a central systems analysis office within the Office of the Secretary to analyze goals and programs on a regular, year-round basis. Operationally, the system would function similarly to the defense PPB arrangement. In January of each year, the departmental bureaus would prepare statements of objectives to be incorporated into each department's basic program. The Secretary would review these proposals and, in March, give his tentative decisions. The bureaus, in turn, would use this guidance to prepare revised five-year programs, while a copy of the Secretary's tentative guide lines went to the BOB for analysis. At the same time, each department's systems analysis office would conclude its in-depth studies of the bureau program and, by April, would incorporate these into "program memoranda" for use in the summer budget preview with the BOB. These memoranda would specify program contents, objectives, cost-benefit analyses, and include suggestions for new legislation. Following the summer preview conferences, by August, changes in the official 5-year programs would be approved and new systems analyses to be completed by next spring would be assigned. In early September, the individual bureaus would submit to the Secretary their next year's budget requests consistent with the new five-year program. The Secretary would make final decisions and send the departmental budget request to the BOB by early October.

On 16 August 1965, three days after Schultze's memorandum was written, Califano passed the document on to President Johnson with his ringing endorsement.[535] Since his appointment to head the domestic programs a year earlier, Califano had been appalled by the "very unsystematic and chaotic and anarchic" state of management in the civilian agencies, particularly in contrast with the OSD. Again, it was the prospect of centralized control that enthused the White House staffer. Califano recommended to the President that, at the next Cabinet meeting, he lend Charles Schulze "overt and substantial support" for the implementation of PPB and that each department or agency head be directed to acquire the personnel necessary to create a central systems analysis office. Califano's note is marked "YES" by the President. Subsequently, at a Cabinet meeting on 25 August that was immediately followed by a press conference, President Johnson directed the implementation of PPB across the federal bureaucratic structure.[536] In his comments, Johnson pointed out that PPB "will improve our ability to control our programs and our budgets rather than having them control us."[537]

The spread of PPB and systems analysis to the social welfare agencies opened potentially rich research opportunities for the RAND Corporation. President Johnson's PPB directives on 25 August 1965 accelerated the dispersion of RAND analysts throughout the civilian agencies. The President ordered that all affected departments and agencies create central systems analysis offices that would perform program analysis and policy planning. Not unexpectedly, in those agencies most closely associated with the Great Society programs, these crucial offices were headed by RAND expatriates recruited from either the Pentagon or Santa Monica. William Gorham,[538] for example, was appointed Assistant Secretary for Program Coordination of the Department of Health, Education and Welfare after having worked in planning and evaluation under Robert McNamara as Deputy Assistant Secretary of Defense for Manpower. Before joining McNamara, Gorham had been an analyst at RAND who researched such topics as the application of network

flow models to personnel planning. Also, as was mentioned above, the former head of RAND's Economics Department, Joseph Kershaw was appointed Assistant Director of OEO for Research, Plans, Programs, and Evaluation. Kershaw immediately hired as his assistant Robert A. Levine,[539] another RAND economist whose work during the 1950s had focused on modeling military problems. At OEO, Levine described his task as "basically to set up a scheme for what kinds of things we were planning for, in what kinds of categories we were planning, what kinds of programs we'd be looking for, how should we be looking for and at these programs--all future or tentative."[540]

Further, as Budget Director Charles L. Schultze worked throughout the summer of 1965 to design the transfer of PPB, his two Assistant Directors, Henry Rowen and William Capron, were both RAND alumni. In August, however, Capron announced his intention to join Kermit Gordon at the Brookings Institution, and Schultze thereupon appointed RAND economist Charles Zwick as a successor. Zwick had been at RAND since 1956 and spent his last two years there performing systems analyses on the Vietnam conflict. Later, upon Schultze's resignation, Zwick would become BOB Director. Schultze's other Assistant Director, Henry Rowen, had the primary responsibility for the "civilianization" of PPB and concentrated his efforts in that direction until July 1966 when he was appointed to RAND's presidency. Finally, with the dissemination of PPB to the non-defense agencies, RAND was called upon to provide extensive staff support to the civilian agencies through the corporation's Bethesda, Maryland, office. RAND cost analyst David Novick's 1965 volume, Program Budgeting, became an overnight federal best-seller as, by September 15, the agencies had ordered almost 5,000 copies through the government printing office.[541] Still, as late as 1966, the RAND Corporation itself had not yet decided formally to diversify its research program and join the social policy research gravy train. In the face of burgeoning opportunities to apply systems analysis to non-military problems, RAND management, and particularly president Frank Collbohm, struggled with the notion of diluting the organization's historic commitment to national security research. As Part III of this book illustrates, RAND's resolution of this dilemma was wrenching but ultimately transformational.

Back to Table of Contents

Part 3:
RAND Diversifies into Social Welfare Research, 1960-1966

Chapter Seven
RAND at the Rubicon

RAND now faces the crisis that may determine if it will continue to live, be crippled, or die (and to die may be better than to be crippled). [542]

Charles Carey, October 1961

In March 1961, the RAND Corporation celebrated the fifteenth anniversary of its genesis as Project RAND, and the corporation's over 1,000 staff members could look back on a decade and a half of remarkable growth and intellectual production. RAND had achieved an intellectual outpouring during those years that rivaled in sheer knowledge output any research institution of the period – academic, government or industrial. Throughout the 1950s, RAND's research community had generated a remarkably diverse and extensive body of knowledge, almost entirely within the national security rubric. Furthermore, the future seemed even brighter. RAND in 1961 still garnered nearly 90 percent of its research funding from the U.S. Air Force, and the Air Staff continued to rely on RAND for "independent" policy analysis and research. At the same time, RAND's deepening ties to the Office of the Secretary of Defense elevated the organization's influence to the highest levels of the civilian defense establishment. RAND's distinctive approach to defense policy analysis – detached, rational, mathematical – clearly had shaped the nation's security posture. Indeed, a cursory review of RAND's index of research compiled in 1961 and published in 1962, underscores RAND's involvement in all aspects of defense policy. This thick compendium lists thousands of separate reports published by RAND staff members over the organization's first fifteen years. To an outside observer, RAND seemed to be set on an unobstructed path towards greater influence and prosperity.

The ascendance of Robert McNamara to the Office of the Secretary of Defense, and his embrace of RAND's analytical methods turned out to be a watershed event for the RAND Corporation. RAND's penetration of the top echelons of the Defense Department created unprecedented opportunities, but it also disrupted the symbiotic relationship RAND had enjoyed with its original benefactor – the Air Force. Many of RAND's staff members and administrators recognized the profound importance of these events for their organization and its future. The developments of early 1961 catalyzed a broad discourse within RAND concerning the organization's future course, the intensity of which is captured in a flurry of introspective "Whither RAND?" essays written by RAND staff members and managers throughout the summer of 1961.[543] These essays grappled with RAND's role as a research institution, the emerging conflict of interest between its ties to the Secretary of Defense and its historical relationship with the Air Force, and the trajectory of RAND's research program in the coming years. This discourse was prescient indeed, as the "Whither RAND?" outpouring coincided with the start of a tumultuous five years that, by 1966, resulted in a fundamental redirection of RAND's research programs. Part III of this book spans this five-year period, tracing the breakdown of relations between RAND and the Air Force, the wrenching impact of the Vietnam War on RAND, and the corporation's ultimate decision to diversify its research program from national security into social

welfare analysis. In 1961 RAND stood at its Rubicon facing a decision that forever altered its relations with the Air Force.

The Showdown over ISA

By mid-1961, the stage had been set for a confrontation between RAND and the Air Force concerning RAND's evolving and increasingly prominent role in the upper levels of the Department of Defense. After several years of friction concerning RAND's independence, the corporation's acceptance of a contract with the Assistant Secretary of Defense-International Security Affairs (ISA) to conduct a research program in limited and "third area" warfare, despite the explicit prohibition of the Air Force, precipitated a showdown between RAND and the Air Force in late 1961. As mentioned previously, Henry Rowen had initiated, while he was a member of RAND's staff, the corporation's relationship with ISA through research performed under an ARPA-administered contract. Under the direction of Paul Nitze and Rowen, ISA quickly became the locus of much of the Kennedy Administration's central staff work on national security policy. According to Paul Nitze,

> During Mr. Kennedy's regime, policy . . . wasn't made by the Policy Planning Staff at the State Department. I would have favored that, but they wouldn't do it. It was not really made by Mac Bundy and the NSC staff, and it was not being made by the services. . . . Most of the work was done—the staff work was in fact done in ISA on many of the important problems. Certainly this is true of the work with respect to Laos. That Laotian problem was one of the burning problems in the spring of 1961. It was certainly also true with respect to the Congo problem. . . . With respect to the arms control issues, those were largely headed up by us in the ISA. I think most of the NATO issues were headed up by us in the ISA. . . ."[544]

An important reason for the ascendance of ISA to leadership in national security policy-making during the early 1960s was the increased attention paid by the Kennedy administration to "third area" conflicts. American strategists perceived the outbreak of apparently communist-inspired guerrilla conflicts in Latin America, Southeast Asia, and Africa as illustrating a fundamental shift in the Cold War. During the late 1950s, writers such as RAND's William Kaufmann argued that the U.S. strategy of massive retaliation lacked credibility as a deterrent to anything other than the Soviets' surprise initiation of total nuclear war, an increasingly unlikely eventuality.[545] This "credibility gap" arose from recognition that the United States would be unlikely to launch a global thermonuclear exchange to protect peripheral interests such as Laos. The Soviets and Chinese could be expected to recognize this weakness in American strategy and to engage in "nibbling" attacks along the periphery of the free world. Former Army Chief of Staff Maxwell Taylor[546] argued in his influential book, The Uncertain Trumpet, that to counter this threat the American military would have to be capable of flexible response to communist attacks in formerly peripheral areas.[547] In Senator John F. Kennedy, Taylor had an early communicant and, as Kennedy's presidency began in 1961, the flaring of troubles in Laos and the Congo seemed to underscore the urgency of the problem.[548]

The growing concerns of the Kennedy administration over "third area" conflicts opened further opportunities for RAND via the connections between Henry Rowen, now in ISA, and Albert Wohlstetter, Rowen's mentor at RAND who had declined an offer to join McNamara's staff. As RAND vice president J. R. Goldstein[549] noted in a letter to trustee Edwin McMillan,[550]

> For some months there have been discussions between RAND people, notably Albert Wohlstetter, and officials of the International Security Affairs Office of the Department of Defense, headed by Paul Nitze. It has become increasingly evident that the probability of our continuing to fight only wars in areas other than the U.S. and U.S.S.R. is high. This high prospect is matched by capability which leaves something to be desired and a research effort not very impressive to those who hope to redress our capabilities. As discussions continued, RAND developed an increasing interest in the work. Not only did it seem crucially important from a national standpoint; we convinced ourselves that we did have, or at least should have, a unique combination of skills necessary to tackle this clearly interdisciplinary problem.[551]

RAND had done only limited research in this field under Project RAND because the study of third area conflicts involved a variety of inputs other than those native to the Air Force, and because the implications of limited war studies—principally, the reemphasis of conventional weapons—were anathema to the Strategic Air Command. While a contract with ISA sidestepped these obstacles, it also promised to elicit an angry reaction from the Air Force.

On 1 August 1961, Deputy Secretary of Defense Roswell Gilpatric[552] sent a letter to Frank Collbohm formally offering support for a continuing research program on potential conflicts in "third areas," research that would be worth between $1 and $2 million annually ($7 to $14 million in 2008) and require the efforts of approximately 40 to 50 people.[553] In essence, RAND's work for ISA would comprise several research projects on potential conflicts during the upcoming decade in allied, neutral, and satellite countries (third areas). It included work on NATO military policy, western views of the East-West confrontation, logistics problems, and support systems for limited wars and counterinsurgency operations. In addition, it would lead to several historical studies on topics such as the British antiguerrilla campaign in Malaya and the Quemoy crisis. The contract would also require RAND to analyze the economic problems of these "third areas" and U.S. economic assistance to Latin America.[554] When added to then-existing contracts, the ISA program would expand RAND's non-Air Force activities to nearly thirty percent of the corporation's total efforts.

Because the prospective ISA contract offered both lucrative opportunities and profound risks, it became the topic of intense debate within RAND. A year earlier, Frank Collbohm had warned RAND's Management Committee that work for ISA would embroil the corporation in "an inter-agency power struggle."[555] Within RAND, the strongest advocacy in favor of accepting the ISA contract came from the Research Council, a panel of RAND's most senior staff members formed in 1960 to lend guidance to the corporation's research program. In a meeting on 4 August 1961, the council summarized the arguments both for and against RAND's acceptance of the ISA contract and arrived at a consensus that that movement beyond Air Force sponsorship was not only preferable but perhaps necessary for RAND's long-term survival.[556] They reasoned, first, that RAND's competence would likely increase because work for ISA would require the recruitment of talent in fields that were at present neglected or insufficiently represented at RAND. In the same vein, it would make RAND a more attractive place for the types of talent that the corporation already employed and help recruit replacements for some of the first-rate policy analysts that RAND had recently lost. Second, ISA research would give RAND easier access to data that were not then easily available to RAND researchers. Third, they reasoned that work on limited war and other conflicts in third areas transcended the interests of any single service or agency and might involve interests of the Air Force, the Army, the Navy, the State Department, CIA, USIA, the Treasury, and the Department of Commerce. Research on such transcending problems could not, therefore, easily be sponsored by any single agency other than ISA. This point was magnified by the council's rather frank assessment that in the distribution of

influence within the government, the power of the Secretary of Defense was ascending while that of the Air Force was descending. Research Council members thus found it imperative that RAND continue to cultivate closer relations with the component offices of the Secretary of Defense.

The Research Council also concluded that RAND's decision to accept or reject the ISA contract carried considerable implications for the corporation's future abilities to secure sponsorship outside of the Air Force. RAND's refusal of the ISA contract would create the impression that RAND was willing to sacrifice its independence for Air Force interests. This would damage the morale of RAND's professional staff and set a dangerous precedent in RAND's ongoing relationship with the Air Force, which had already been strained by the Air Force's recent attempts to control RAND activities.

Finally, the Research Council rationalized its position in favor of accepting the ISA contract by arguing that whether the Air Force knew it or not, the contract would benefit the Air Force. This research was certainly going to be performed, if not by RAND then by research organizations perhaps less sympathetic to the Air Force. Also, many (but not all) of the research results obtained under the contract would be available not only to OSD but to the Air Force. Finally, there would likely be a favorable spill-over effect from the ISA research to Project RAND work. RAND's reputation for non-partisanship would be enhanced by such a contract with OSD, which, in turn, would help make studies done under Project RAND more influential and useful to the Air Force. Although the Research Council considered several counter-arguments to accepting the ISA contract, these arguments were presented largely as qualifications to the arguments in favor. They certainly did not diminish the consensus of opinion supporting RAND's acceptance of the contract despite Air Force objections.

To RAND's dismay, the Air Force leaders definitively prohibited RAND from accepting the contract. In a letter documenting the Air Force position, General Wilson wrote that RAND's acceptance of the sizeable ISA contract would:

a. [i]ntensify growing reluctance in the Air Force to divulge information to RAND due to uncertainty of where the information would eventually end up and [for] what purposes it would be used.
b. [f]orce RAND to provide military advice and make military judgments.
c. [i]ntroduce internal conflicts prejudicing RAND's relations with the Air Force.
d. [c]ontribute to RAND's movement away from the Air Force because of greater diversification.
e. [c]reate capabilities in ISA which duplicate responsibilities of the Weapons System Evaluation Group [of the Joint Chiefs of Staff].[557]

Air Force leadership felt that ISA had invaded much of the policy area that was formerly the province of the Joint Chiefs of Staff, and that the subject matter of this research posed a direct conflict with its interests.

Faced with the Air Force's firm stance, RAND's management sought guidance from the corporation's highest authority, its board of trustees. RAND's board was charged with maintaining RAND's organizational vision, and thus for balancing short term opportunities with the strategic direction and long term interests of the organization. On 8 August 1961, the Executive Committee of the board met to consider the desirability of the ISA contract. After lengthy discussion, the board concluded, "the importance of this work to the national security and welfare, the unique capabilities of the Corporation, and the effectiveness with which this work could be performed at the DOD level, all indicate the Corporation should undertake the suggested contract."[558] Anticipating Air Force backlash at its decision, the Executive Committee suggested

that the work be performed under a long-term contract rather than a one-year arrangement. This would give RAND some insurance against punitive Project RAND funding cuts by the Air Force by ensuring a relatively stable source of support from the DOD. The committee also recognized the need for damage control with the Air Force. It directed RAND's management "to proceed in such a way as to minimize the negative effect of this work on the Corporation's performance under Project RAND."[559]

On 12 August, Frank Collbohm met with an incensed Curtis LeMay, now Air Force Chief of Staff, to transmit RAND's decision to go ahead with the ISA research despite the Air Force's prohibition. Beyond a "talking paper" prepared for LeMay by Lt. Colonel John G. Dailey (the Air Force officer responsible for day-to-day relations with RAND), no record of the events of this meeting has yet emerged. The vehemence of LeMay's response, however, easily can be imagined. His rage was soon translated into policy as he and his staff immediately began work on new strictures for RAND that would be issued one month later as the "Zuckert Directive."

The Attack on the Nonprofits

Although the Air Force could not prevent RAND from accepting the ISA contract, the service did have a new card it could play against the corporation's separatist trend. By the spring of 1961, press and congressional attention began to focus on the roles and possible "undue influence" being exerted on national security policy formulation by nonprofit research organizations, such as RAND.[560] Several congressional committees had announced their intentions to study nonprofit affairs, including the House Committee on Science and Astronautics (Brooks Committee), the Military Operations Subcommittee of House Committee on Government Operations (Holifield Committee), the Special Investigations Subcommittee of House Committee on Armed Services (Hebert Committee), and the House Committee on Post Office and Civil Defense (Davis Committee).[561] Although many of these hearings failed to materialized during the 1961 sessions of Congress, the House Military Appropriations Subcommittee of the Committee on Appropriations (Mahon Committee), in June 1961, issued a stern warning to the Secretary of Defense concerning the use of nonprofit advisory corporations. In its regular report on Defense Appropriations for Fiscal 1962, the committee insisted that Secretary McNamara establish and announce a "realistic" policy with respect to the growth of nonprofit corporations and their use by his office. Otherwise, the committee stated that it expected to recommend that severe restrictions be imposed on such organizations.[562]

As Bruce Smith notes, "The emergence of the nonprofit research or advisory corporation is one of the most striking phenomena of America's postwar defense organization."[563] Because RAND was one of the earliest and most successful institutions drawing scientific and technical talent into the realm of military research and development, it quickly became a model for other branches of the Department of Defense. By 1960, all of the military services and the Office of the Secretary of Defense supported more or less "captive" nonprofit advisory corporations—a practice that began to attract criticism from several quarters.[564] While rapid growth in the number of nonprofit defense contractors during the late 1950s gradually attracted greater attention, the formation of Aerospace Corporation by the Air Force in 1960-61 served as a lightening rod for criticism.

Known as a "Systems Engineering/Technical Direction" (SE/TD) contractor, Aerospace Corporation was a nonprofit corporation tasked with performing systems engineering on space and missile programs for the United States Air Force.[565] Originally part of the private, for-profit Ramo-Wooldridge Corporation (R-W), Aerospace had been spun-off in 1960 at the instigation of the House of Representatives' Military Operations Subcommittee after R-W had merged with

missile components manufacturer Thompson Products Co. to form TRW, Inc.[566] The creation and employment of Aerospace Corporation by the Air Force immediately attracted criticism from other congressional bodies. By early 1961, demands for reduced use of nonprofit contracting stemmed from two sources whose objectives were largely contradictory: for-profit defense contractors and the civil service.[567] For-profit contractors, particularly the burgeoning stable of for-profit systems analysis firms, saw a threat to their businesses. While government officials, argued that the nonprofits performed public sector duties and were created largely to evade civil service employment restrictions. In particular, they argued that the extensive use of nonprofit contractors represented an effort by executive branch agencies to circumvent legislative controls on salary levels and associated expenditures.

At the same time, and again in agreement with the industrial critics, the subcommittee found that the cost-plus-fixed-fee contracts extended to the nonprofits, such as that employed in the Project RAND relationship, did not provide sufficient incentive to keep costs at reasonable levels. Committee members pointed out that such arrangements did, however, permit the nonprofits to allocate funds as they saw fit, thus allowing the Defense Department to escape congressional oversight of budget allotments. Additionally, critics argued that the out-sourcing of analytical and decision-making functions that rightfully belonged within the domain of the government not only evaded constitutionally-mandated Congressional oversight, but it also militated against the buildup within the military branches of sufficient technical competence to insure effective supervision of contractors and sound decision-making. Thus, while the public-sector critics argued that nonprofit work should be performed within the government and private-sector critics argued it should be given to competitive for-profit firms, both believed the role of the nonprofits should be drastically reduced.

The Zuckert Directive

In response to this groundswell of criticism, and perhaps to head off more incisive inquiries, the Kennedy administration announced the formation of its own committee to investigate government contracting for research and development, particularly its use of nonprofit corporations. This interdepartmental committee was officially created on 31 July 1961 by a letter from President Kennedy to the group's chairman, Bureau of the Budget Director David E. Bell,[568] and instructed to present its findings by 1 December 1961.[569] Eugene M. Zuckert, Secretary of the Air Force, and Curtis LeMay, however, were unwilling to abdicate the service's role as policy-maker vis-à-vis its nonprofit contractors, especially in light of the problems with RAND and the ongoing struggle with McNamara and his staff. As RAND's leadership adopted its entrenched position regarding the ISA research despite Air Force opposition, Zuckert and LeMay worked with Air Force General Counsel Max Golden[570] to preempt the Bell Committee and develop their own policy on the management of nonprofit contractors.[571]

These efforts resulted in a policy directive issued by Secretary Zuckert on 22 September 1961 that both satisfied the Mahon Subcommittee's demand for more rigorous control of nonprofit contractors and provided an opportunity to end the waywardness of the Air Force's prodigal child, RAND.[572] Authored largely by LeMay and his staff, the two-page document reflected both his and Zuckert's frustration with RAND's deepening relationship with the Office of the Secretary of Defense and set in stone a new set of rules by which the Air Force would monitor and control the nonprofit corporations that it supported. These rules included the loss of nonprofits' freedom to contract with other government agencies without Air Force approval, the requirement that the nonprofits' affairs be open to Air Force scrutiny, changes in the basis of

contract fee determination from value received by the Air Force to "need," a prohibition against contractor-owned facilities, and the assumption by the Air Force of the right to determine the disposition of nonprofits' corporate assets in the event of dissolution.[573] The second and third paragraphs of the Zuckert Directive were aimed explicitly at RAND:

> Procedures must be developed to require [Air Force-sponsored nonprofit corporations] to coordinate with the Air Force before undertaking assignments from other government agencies or commercial sources.
>
> It follows, moreover, that the business aspects of their affairs must be open to Air Force scrutiny, much as an actual Air Force operation.[574]

The Zuckert Directive thus drew a line in the sand across which RAND and the other Air Force-sponsored nonprofits would not be allowed to cross. If they were to continue under Air Force sponsorship, they must consider themselves largely extensions of the Air Force and subject to its oversight and control.

Zuckert's policy statement sent shock waves through RAND's research staff as it seemed an unapologetic attack on a bastion of RAND's self-identity: independence. Since RAND's creation, the Air Force had considered it to be operationally independent but subject to the strictures of a "lawyer-client" relationship. Within the RAND Corporation, on the other hand, independence meant intellectual freedom and objectivity. RAND vice president L. J. Henderson expressed this disparity in November 1961, as RAND struggled to come to terms with the Zuckert Directive:

> [E]ven from the beginning, RAND, as viewed by RAND, and as viewed by the Air Force, have always been different. . . . The Air Force's image of RAND is that it is an instrument of the Air Staff and that they created it and that they are solely responsible for its progress and success. Essentially they see no distinction between Project RAND and The RAND Corporation. . . . [However,] from the very beginning . . . [RAND] has viewed itself as an instrument devoted to the national security . . . [and] loyalty to the Air Force . . . tended to get impaired as we moved into more outside activities.[575]

In a larger sense, RAND's deepening struggle with the Air Force for independence signaled not just the particular circumstances of the RAND-Air Force relationship but the erosion of the "pure science ideal" that characterized post-World War II American policy-making. At the conclusion of World War II, the decisive impact of scientific development on the war's outcome captivated U.S. military, political, and scientific leaders. Fundamental scientific research apparently had led to the development of such critical weapons as radar and the atomic bomb, and Americans shuddered to think of the consequences had Germany or Japan achieved the relevant breakthroughs first. The ideological model that emerged from this experience was enunciated in 1945 by Vannevar Bush, the director of President Truman's Office of Scientific Research and Development, in his book Science the Endless Frontier.[576] Bush's influential work postulated a "linear model" of scientific-technological development in which advances made in "pure" science led, eventually and inevitably, to advances in applied science and technology. By "pure" science, Bush referred to the pursuit of fundamental scientific knowledge that, prior to World War II, had been the province of universities and a handful of corporate laboratories. Bush argued that in the future, the United States could ensure its technological superiority over potential rivals only

through expanded sponsorship of technology-generating scientific research unfettered by partisan politics.

Project RAND and the RAND Corporation were, to a large degree, products of Bush's model of scientific-technological development. Perhaps revealing his academic background, Bush advised that in peacetime pure science would not flourish in closely guarded military or industrial laboratories but had to be pursued in an environment of intellectual freedom and independence, which for Bush clearly meant the research university. This created a dilemma for military leaders. On one hand, most top-level military officers were convinced of the importance of scientific research in achieving weapons technology advances. On the other hand, however, Bush argued convincingly that laboratories directly managed by the government would provide poor venues for this crucial work—an argument that was substantiated by the flight of scientists out of wartime labs and back to academia at the conclusion of hostilities. Air Force leadership found a solution to this problem through RAND, a research university without students, in which scientific research would be conducted for the Air Force but ostensibly free from direct Air Force control.

During the 1950s, however, the power of Vannevar Bush's arguments gradually waned as Air Force leaders found RAND to be the source of considerably more aggravation than advance in weapons systems. Although RAND played host to a wide range of pathbreaking basic research, particularly in applied mathematics and the social sciences, RAND's champions within the Air Force were increasingly hard-pressed to demonstrate the relevance of such fundamental scientific advances as dynamic programming for the service's interests. Whereas Sputnik's launching stimulated a massive resurgence of U.S. government funding for scientific research, particularly on university campuses, RAND enjoyed no similar renaissance.[577] By 1960, top military leaders such as Curtis LeMay were no longer captivated by the promise of "pure science," and their efforts to control RAND reflected a shift away from Bush's model of scientific-technological development towards a more narrow concentration on purposive research and development.

The Zuckert Directive of September 1961 delineated two eras in the Air Force's sponsorship of fundamental scientific research—the early Cold War period shaped by Bush's notions of "basic science" and a period in which military funding gravitated towards closely controlled, goal-specific research. At the time, the directive drew in sharp relief the contrasting visions of RAND's independence and caused a growing fraction of the RAND community to question the corporation's long-term viability. As a prototype of the Bush model, RAND's nature contrasted with the emergent military desires for tighter control, and many observers at RAND believed that the corporation could not—and perhaps should not—survive in an obviously servile role.

RAND Considers Its Options

With the publication of the Zuckert Directive, RAND's managers had to discern both the strictness with which the directive would be enforced and the directive's implications for RAND's short- and long-term prospects. Commenting on the directive's ambiguity, RAND staff members Gustave Shubert and L. B. Rumph wrote that "the wording might permit a wide range of interpretation. Some interpretations could be innocuous as far as RAND would be concerned; others could be almost intolerable."[578] Almost immediately, however, RAND received indication that enforcement of the directive would be strict. Just two days before the Zuckert directive was issued, RAND had completed verbal negotiations with the Air Force for its annually renewed Project RAND contract (fiscal year 1962). As the contract was about to be signed, however, the Zuckert directive was made public, and the contracting officer demanded a complete renegotiation of the contract.[579] Less than a month later, Secretary Zuckert mandated that any

contracts with RAND or the other nonprofit corporations be formally reviewed by his office to ensure their compliance to the new guidelines.[580]

In an effort to define Zuckert and LeMay's intentions, RAND's management and trustees held a series of hastily arranged meetings with Air Force leaders, including meetings with Air Force General Counsel Max Golden on 4 October and with LeMay on 23 October.[581] Any ambiguity in the message delivered to RAND by the Zuckert Directive dissipated after the latter meeting at which the chairman of RAND's board of trustees, Frank Stanton,[582] met with LeMay to discuss RAND-Air Force relations. In the course of that meeting, the brutally blunt LeMay carved out his views of RAND.[583] In his opinion, RAND had become largely a means by which the Air Staff sloughed off its own responsibilities for staff studies, research, and other activities. This had resulted in RAND's performing far too much policy research. In the future, LeMay "expected RAND to do weapon systems studies, not social science."[584] Commenting on RAND's fee income and program of independent research, LeMay emphasized that RAND should not get a fee for its Air Force research, that it should not do self-sponsored research, and that it should not accept work from other agencies. He pointed to "a basic conflict between [military] and the civilian camp of government," and charged RAND with "strengthening the hand of the civilians."[585] Finally, LeMay expressed his consternation that RAND policy recommendations that had been rejected by the Air Force were repeatedly resurfacing at higher levels of authority, particularly the Secretary of Defense.[586] Following this meeting and others with RAND's contacts inside the Air Force, the corporation's leadership concluded that Zuckert's directives "were minimal 'guidelines,' that further restrictions could be expected, and there would be no exceptions among the corporations named."[587] Thus, they concluded, "The probability is too high for comfort that . . . the terms will be strictly rather than loosely interpreted."[588]

As RAND management read the situation, "the issue is control." The meeting with LeMay confirmed long-held suspicions that "General LeMay, backed by Secretary Zuckert, [is determined] to make RAND bow to restrictions that will destroy its ability to do objective, high quality, interdisciplinary research—the kind of research most needed for the defense and welfare of the United States today."[589] In addition to the ISA issue, Zuckert's and LeMay's disfavor towards RAND was aggravated by the corporation's long-strained relations with the Strategic Air Command (SAC). RAND's relations with SAC had suffered considerably as a result of the research conducted by its policy analysts, a circumstance that was compounded when the RAND expatriates in McNamara's administration took as one of their earliest tasks (in SAC's view, at least) the phasing out of SAC's manned bomber force.[590] SAC had virtually "broken off diplomatic relations with RAND" at various times between 1957 and 1961, and, unfortunately for RAND, former SAC officers pervaded the upper echelons of the Air Force hierarchy.[591] As Eugene Zuckert noted in 1964, "The dominant trend in the Air Staff was toward officers whose background was in the strategic bombing field."[592]

Still, RAND's relations with the Air Force ran deep, and even SAC continued to rely on the corporation's technical capabilities in 1961. For example, in that year, SAC requested that RAND develop a war planning model, known as "STRAP," that was intended to be a planning tool for SAC and the Joint Strategic Target Planning Staff.[593] In 1962, retired Air Force General James McCormack, testified before a congressional committee,

> I know from my own experience in the Air Force that RAND was invaluable to us as staff officers in its capability and its ability to sit rather quietly out of the rut of the day-to-day operations in the Washington scene and think about what it is we are really up to here, where do we need to be ten years from now, and what should we start doing now to get ready for

> that, rather than to solve last Wednesday's problems, which all of us in the Pentagon have some tendency to do.[594]

Indeed, many Air Force officers felt that the increasing demands for analytical rigor demanded of the Air Force by the Office of the Secretary of Defense heightened the value of RAND's reputation for independence in pursuing Air Force budget objectives.

As RAND's leaders debated the corporation's alternatives, the Office of the Secretary of Defense raised the stakes. It invited the corporation to expand its relationship with ARPA by contributing to that agency's Project AGILE—a study of field combat techniques and hardware, particularly those applicable to Southeast Asian conflicts. On 13 October, the Executive Committee of RAND's board of trustees was informed of this opportunity and authorized management to undertake the work. Perhaps to send a message of defiance to Zuckert and LeMay, the board's executive committee stated that it "saw no reason why this activity should diminish the Corporation's effectiveness in discharging its obligations to the Air Force under Project RAND, and saw some reason to expect a beneficial effect."[595]

As discussions continued, consensus emerged among RAND's leadership that submission to the Zuckert Directive could not be countenanced. In their view, RAND's compliance with the directive would have several catastrophic consequences for the organization.[596] First, if the policy research content of RAND's research program were to be scotched, "the Economics and Social Science personnel should be terminated, or, as LeMay has suggested on more than one occasion, be transferred to some other place like the Air University."[597] Second, new policy research projects initiated at RAND would have to be approved by an appropriate office in the Air Force. This was thought to have severe personnel implications since "one of the most attractive features of RAND employment [is] the ability on the part of good research people to think about problems in their own way, [and] to have a part in deciding what kinds of questions ought to be answered."[598] In terms of the recruitment of top-notch scholars, RAND's management felt that the corporation's "major competitor is the universities of the country . . . [and] the fact remains that first-rate people will not come here unless they can have assurance that they will have a good deal of initiative in deciding what they will work on and how they will work on it."[599]

In addition, RAND management recognized that the elimination of RAND's fee income would lead to the termination of the RAND-Sponsored Research program (RSR) and further detract from the ability of the organization to recruit and hold prime research talent. They estimated that, on average, five to ten percent of RAND's professional staff was engaged at any one time on projects funded out of the RSR program. This was a crucial outlet for creative interests since "The simple fact that there is money available when one gets stale from working on military problems and that . . . [a researcher can] move over into something that is more narrowly a part of his profession than what [he or she] has been working on is . . . very important."[600] To Joseph A. Kershaw, the head of RAND's Economics Department, compliance with the Zuckert Directive meant that "interdisciplinary [research] would simply have to come to an end."[601]

Although they found the Zuckert Directive's implications for RAND to be uniformly deleterious, RAND's managers disagreed as to how the corporation should respond. Some, such as Joseph Goldsen,[602] the head of RAND's Social Sciences department, supported the adoption of a "holding operation," but not for the purpose of outlasting the anti-RAND contingent in the Air Force. They argued that while LeMay and Zuckert might be unusually zealous persecutors of RAND, the corporation's real problems lay in its excessive dependence on Air Force support. Even with the acceptance of the contract with the Assistant Secretary of Defense-International Security Affairs (ISA), Project RAND still represented nearly seventy-five percent of RAND's operating funds. As such, RAND's only means of ensuring long-term independence was to

diminish its reliance on the Air Force. A delaying strategy would create a "grace period" for RAND during which it could avoid officially rejecting the Zuckert guidelines yet act outside of them to build a broader and thus more secure base of sponsorship.

Implicit in this position was support for immediate, aggressive diversification of RAND's research program and fundamental organizational change. In contrast, other managers argued that broadening RAND's base of sponsorship was not in the corporation's long-term interests and that all efforts should be made to repair existing relations—even at the cost of abandoning work for the Secretary of Defense. For example, David Novick,[603] the head of RAND's Cost Analysis Department, argued that RAND's problems with the Air Force stemmed primarily from the personalities of LeMay, Zuckert, and a minority of military leaders and that a conciliatory approach would be advisable. He proposed a strategy of "protracted negotiation" under which RAND would continuously reject contract offers and operate instead under letters of intent until the departure of the relevant individuals. RAND could thus maintain its freedom to maneuver in the short-run and avoid obligating itself contractually under the new guidelines. Presumably, once LeMay et al. had moved on, RAND would be able to conclude a Project RAND contract immune from the Zuckert Directive.[604]

Few people at RAND felt as strongly as Frank Collbohm that the corporation's primary allegiance should remain with the Air Force and that the troubles with Zuckert and LeMay were temporary. In testimony to the Holifield subcommittee in 1962, Collbohm had the following exchange with the committee's investigator:

> Mr. Roback (staff investigator): Do you consider, Mr. Collbohm, that RAND will continue to be in the foreseeable future, as it has been in the past, primarily an Air Force contractor?
> Mr. Collbohm: We hope so.
> Mr. Roback: You are not interested in building up a diversified operation as such?
> Mr. Collbohm: No. As a matter of fact, I do not think it would work too well. I think the Air Force . . . started right out with a philosophy and a policy as to how to handle the type of an organization that RAND is, that is practically perfect, I would say. And it would be very, very undesirable for the country as a whole, if this relationship should be changed.[605]

Throughout this period, Collbohm recognized the dangerous implications of the Zuckert statement for RAND's organization, yet his reaction was tempered by intense loyalty to the Air Force and a deeply held belief that RAND must support the military components of the Department of Defense. As a result, he supported firm resistance to the directive's enforcement but advocated holding the OSD at arm's length while attempting reconciliation with the Air Force. Collbohm had close ties with the Air Force, and he believed strongly in RAND's special relationship and obligation to that organization. As RAND's fortunes increasingly were wed to the OSD, however, Collbohm's rigid loyalties would have severe implications for his leadership of RAND.

In the meantime, Collbohm and his supporters who advised against further diversification in sponsorship argued, with merit, that RAND's initial experience with non-Air Force research left much to be desired. In an essay that explored this topic, Research Council member John D. Williams pointed out that non-Air Force contracts "tend to be of short duration, short range, and more narrow," and that they would "produce feast-or-famine budgets that match neither over-all needs nor distributions of skills, unless they are managed exquisitely."[606] Indeed, the perception that diversification of sponsorship might convert RAND into a "job shop" research organization was a consistent management concern throughout this period.

To avoid the problems encountered with short-term, task-specific contracts, those RAND managers who favored diversification of sponsorship beyond the Air Force often suggested that the corporation find sponsors willing to support omnibus contracts similar to the Project RAND contract. Unfortunately, efforts towards finding such a sponsor had been fruitless. Despite Air Force efforts to increase its control of the RAND research program, the Project RAND statement of work remained extremely broad and permitted RAND researchers an unusual degree of freedom. As the corporation accepted a greater volume of non-Air Force contracts, however, it found that these tended to be of short duration and far more narrow definition, just as Williams had warned. RAND's efforts to conclude a contract similar to the Project RAND arrangement with one of the OSD agencies led nowhere. Thus, rather ironically, greater diversification in its contract support actually diminished RAND's financial stability due to the small size and short duration of the non-Air Force contracts.

The Air Force Raises the Stakes

In late November 1961, the Air Force dropped another bomb on RAND, one timed precisely for impact on the corporation's semi-annual board of trustees meetings, scheduled for 30 November-1 December. Just a few days before the board meetings, the U.S.A.F. Air Staff met with Assistant Secretary of the Air Force Brockway McMillan[607] to discuss the future course of relations with RAND.[608] At this meeting, the Air Staff recommended that Project RAND support be held constant at its current level on the condition that RAND agree to reduce, over a period of three to five years, its proportion of non-Air Force work from the present twenty-five to thirty percent to approximately ten percent. If RAND were unwilling to make this concession, the Air Staff recommended a reduction of between $5 and 7 million in the Project RAND contract starting in fiscal year 1963. The money thus saved would be used to contract with some other organization that would be more responsive to the Air Force's needs and policies. At this point in the conversation, Air Force General Counsel Max Golden interrupted the Air Staff's presentation to inform them that a cut of $2 million in RAND's funding had already been directed by the Secretary of the Air Force.

The news got worse. The Air Staff also notified RAND that, in the future, contract underruns on all nonprofit contracts, would have to be returned to the Air Force. For RAND, this meant the immediate return of approximately $790,000 of unexpended 1961 Project RAND funds, on top of the $2 million funding reduction.[609] The loss of underruns presented considerable problems since, in the past, RAND's ability to roll over contract underruns to subsequent years had been a key means of creating a "continuity reserve." This reserve, in turn, had stabilized corporate finances in the face of volatile Air Force funding and the organization's low degree of diversification.[610]

Faced with this news, RAND's board of trustees took decisive action. At its regularly scheduled meetings of 30 November - 1 December 1961, the board set aside a full day of meetings to study and consider the Zuckert's policy statement and its implications. In those meetings, the board convened a special committee to "(a) examine the future ability of the Corporation to contribute to the national security and welfare and (b) recommend to the Board of Trustees, if practicable within 90 days, policies to maximize that ability and means to implement such policies."[611] RAND's trustees read clearly the shifting power relationship between the OSD and the Air Force, and decided to throw RAND's lot with the emergent dominant force – the Secretary of Defense. Over the next three years, RAND's board of trustees transformed itself such that its membership reflected this new reality. This recomposition is more fully described in chapter ten, below. At the same time, the board instructed its chairman, Frank Stanton, to convey

to Secretary of the Air Force Zuckert the corporation's desire to continue work under the existing Project RAND contract on the basis of a letter of intent—at the current level of effort—until the board received and reviewed the report of the special committee, in essence adopting the "holding operation" strategy.

In December 1961, the Executive Committee of RAND's board met with Secretary Zuckert to protest the impending funding cuts and loss of contract underruns. By then, RAND had ascertained that the combination of these two budget changes would result in a reduction of the Project RAND support from $14.3 to $12.0 million and force a drastic reduction in personnel.[612] At the December meeting, Zuckert confirmed his intention to limit Project RAND support as a means of preventing further growth of the corporation. He also told the group, "Any action by RAND to augment its competence by concluding appropriate contracts with other government agencies would lead to offsetting counteraction by the Air Force."[613] The RAND representatives argued, in vain, that such a punitive action would have a depressing effect on the research staff's morale, leading to severe difficulties in retaining and recruiting high quality personnel.[614]

RAND at its Rubicon

The events of late 1961 quickly placed RAND in a financially perilous situation. The letter contract under which Project RAND was funded during the winter and spring of 1962 provided full reimbursement of expenses but not fee income or depreciation expenses for RAND's facilities. RAND President Frank Collbohm wrote to trustee Edwin McMillan,

> Our operating capital position is precarious; RAND-sponsored activities continue at a rate considerably above our current income. In a sense, our operating capital needs are currently being met by borrowing from our employees. As they accrue vacation, we bill our clients for both the salary and associated sabbatic days for such accruals. We have from this source a cash reserve of more than a million dollars, which we use as operating capital. The money has been earned by our employees and is payable to them when they take vacations—or terminate.[615]

As the special committee of RAND's board of trustees worked over these months to find a solution to the dilemma, they received succor from a familiar source—the Office of the Secretary of Defense—with the belated completion of the Bell Committee report in April 1962.

As was mentioned above, the same congressional pressure for a review of government relations with nonprofit organizations that had spawned the Zuckert Directive had also led to the creation, by President John F. Kennedy, of an interdepartmental committee charged with studying these issues and developing formal policies. The so-called Bell Committee, named for its chairman, Bureau of the Budget Director David E. Bell, attempted to tackle the broad range of issues raised by the proliferation of nonprofit advisory organizations,[616] and its findings were almost uniformly favorable to RAND's position vis-à-vis the Air Force.

This result was due in large measure to the key role played by Adam Yarmolinsky,[617] special assistant to Secretary of Defense McNamara, in drafting the Bell Report.[618] While Yarmolinsky's consistent support for the independence of the nonprofit contractors reflected the general attitudes of McNamara's office and advisors, his arguments were rooted in practical politics. As the report took shape, he argued that continued efforts by the Air Force to treat RAND and its ilk as appendages of the government would not address the criticisms of the congressional committees. Government employee unions and allied interests would continue to argue that if these corporations were captives of the Air Force, they were merely devices to circumvent civil

service pay standards and legislative manpower ceilings. Also, for-profit industrial contractors would continue to complain that the government was giving preferred treatment to these special interests.[619] At Yarmolinsky's insistence, the report specifically contradicted the Zuckert Directive and endorsed both RAND's independence and its freedom to contract with multiple clients:

> In the case of organizations in the area of operations and policy research (such, for example, as The RAND Corporation), the principal advantages they have to offer are the detached quality and objectivity of their work. Here, too close control by any Government agency may tend to limit objectivity. Organizations of this kind should not be discouraged from dealing with a variety of clients, both in and out of Government.[620]

Crucially, the Bell Report segregated RAND from those nonprofit organizations that performed primarily systems engineering and technical direction (SE/TD) work for the government. SE/TD firms such as Aerospace Corporation were "at least for the time being of value principally [insofar] as they act as agents of a single client" and were thus not encouraged to diversify their sponsorship.[621]

With RAND's independence thus firmly supported by the Bell Report, RAND's special board committee determined to pursue a strategy of "flexible response" to further developments in the OSD-Air Force power struggle.[622] In its report to the board of trustees, the special committee concluded that it would be premature to predict the final distribution of authority between the Office of the Secretary of Defense and the three services. In the face of such uncertainties, RAND had to retain the greatest flexibility for future action without seriously weakening its prospects for survival in either the short or the long run. The committee concluded that while "It is unthinkable that RAND should 'desert' the Air Force," the corporation must keep open the possibility of serving other agencies in case authority continues to shift from the Air Force to other agencies. Since there had been trend reversals before, the special committee concluded:

> Hedging requires cultivation on both sides of the road. Practically, we think this means:
> (a) Doing our very best for and under Project RAND.
> (b) Never decreasing the annual expenditure on Project RAND below what the Air Force is willing to support, except as may be in the best interests of the Air Force or necessary by reason of programmed future costs.
> (c) Considering work for other clients only when it can be done without violating (a) and (b) above, when the new work is clearly of national importance, and will either enhance RAND's performance under Project RAND, or its future capability to serve.
> (d) Resisting any external limitation on the size of The RAND Corporation.
> (e) Building up financial reserves at a rate consistent with the other demands on our income.

Acting on these recommendations, RAND's board of trustees met with Secretary Zuckert in Santa Monica on 12 April 1962 and informed him that while RAND intended to remain loyal to the Air Force and retain the Air Force as its principal customer, it must have the freedom to choose other customers.[623] Secretary Zuckert, in turn, replied that while the responsibility for determining basic RAND corporate policy lay with the trustees, RAND work for agencies with supervisory control over the Air Force was a matter of deep concern. Although both sides agreed that Air Force and RAND objectives with respect to one another should be defined and that existing problems and differences should be frankly discussed and resolved, little real progress appears to have emerged from the April meeting.

Immediately following the inconclusive meeting in Santa Monica, however, RAND moved to exploit the leverage provided by the Bell Report. On 27 April, Frank Collbohm met with Air Force General Counsel Max Golden to assert more firmly the corporation's position on its independence and the as-yet-unsigned Project RAND contract. Golden's memorandum to Zuckert and LeMay reporting this meeting merits extensive quotation:

> Needless to say, yesterday's conversation with Frank Collbohm was a shocker. It is incredible that a man in Collbohm's position would tell us that the only alternative to giving RAND what it wants is to close down the RAND operation as of April 30. He said that his was the position of the Board of Trustees and that no compromise was in the cards. . . .
>
> Collbohm reiterated several times that the Board felt so strongly on the subject that it was willing to close up shop if only to demonstrate to all the importance of the principle of independence that RAND saw in jeopardy. He got up to leave several times. After listening to his line for over an hour, I told Mr. Collbohm that (a) his dedication and that of his colleagues overwhelmed me, (b) unlike RAND we could not afford the callous luxury of jeopardizing the national interest, and (c) accordingly, with a gun at our head, I was authorized to go along with the terms of the old negotiation.[624]

Collbohm's show of force had instant effects. With the glowering RAND president still in his office, Golden telephoned Adam Yarmolinsky and appealed for advice. Yarmolinsky had previously directed that in the event RAND negotiations reached an impasse, they be submitted to him. Yarmolinsky advised Golden, "in the final analysis [the Air Force] would have to decide how badly [it] needed RAND's services—on [RAND's] terms."[625] Thus, with Yarmolinsky's clear support for RAND, Golden committed the Air Force to a contract for Project RAND that conceded to RAND's demands.[626] In his report to Zuckert and LeMay, Golden lamented, "taking into account the immovable position of RAND and the impact on us if RAND were permitted to close its doors, we had no alternative."[627]

While Collbohm's confrontation with Max Golden did nothing to diminish the animosity between RAND and the top-ranking leadership of the Air Force, it seems to have resolved the immediate crisis and set a pattern for RAND-Air Force relations. For the next two years, relations between RAND and Zuckert and LeMay remained tense, but RAND was able to count on support from the Office of the Secretary of Defense and the authority of the Bell Report to evade the policy guidelines of the Zuckert Directive. As such, Project RAND negotiations over these years were a constant source of irritation.

At the same time, RAND leaders, especially Frank Collbohm, and their counterparts in those Air Force segments most closely associated with RAND worked steadily to reestablish close communications and demonstrate RAND's value to the Air Force. During 1963, for example, RAND's Robert Buchheim served as the Air Force's chief scientist and chairman of its Scientific Advisory Board. Also, RAND's contacts with the Air Force Advisory Group (AFAG)—the new title given to the Military Advisory Group in 1960—increased substantially after the 1962 showdown. These contacts included a meeting between RAND managers and AFAG members on 2 July 1962 to discuss recent events. According to a letter from Lt. General James Ferguson, Deputy Chief of Staff, Research and Technology, to Frank Collbohm, a series of agreements were reached concerning the improvement of RAND-Air Force relations.[628] These were, (a) recognition of the need to draw RAND and the Air Force closer together and reestablish the healthy, productive relationship that had existed in the past, (b) agreement to develop a mid- or long-term research program or goals to better analyze and plan the program, and (c) desire to

safeguard Air Force proprietary type information possessed by RAND. Over the next year, concrete steps were taken on both sides in pursuit of these goals, including the development of a talk for Mr. Collbohm to give to key employees regarding "Ethics versus Academic Freedom."[629] Additionally, RAND management implemented a procedure whereby it would more closely screen people and projects that seemed vulnerable to critical comment.

RAND and Air Force officials also took steps to increase the amount of contact between the corporation's board of trustees and the Air Force. For example, they arranged for the semi-annual board of trustees meetings to be immediately preceded by direct meetings between the trustees and the members of the AFAG.[630] In January 1963, RAND trustees and managers again met with Secretary Zuckert, General LeMay, and other top Air Force officials to review outstanding issues. At that meeting, the two sides arrived at an agreement concerning the most sensitive issue—the corporation's pursuit of non-Air Force sponsorship. According to this agreement, RAND would not assume non-Air Force work without prior RAND-Air Staff management-level agreement. This covenant was qualified, however, with the understanding that if no agreement could be reached, a trustee-appointed committee would meet with top level Air Staff representatives to resolve the issue. The ambiguity of this agreement caused each side to believe that it had the final say over "outside" contract decisions and led to the reemergence of problems by 1965.[631]

Nevertheless, by the end of 1962 RAND's relationship with the Air Force had been temporarily stabilized. Tensions at the highest levels temporarily had been diffused, contact between RAND staff members and the Air Force had improved, and Frank Collbohm had shown a willingness to step up management's watchfulness over research efforts so as to mollify Air Force concerns. Antagonism between RAND and the Air Force would again blossom in 1965, but by then the context both at RAND and throughout the Defense Department had been transformed by deepening U.S. involvement in the quagmire of Vietnam.

Back to Table of Contents

Chapter Eight
The Wrong War: RAND in Vietnam, 1954-1969

RAND's work always relied upon the rational decision-maker on both sides. There was never any real questioning of whether the Soviets would be rational. We would send them a message, they would get the message, they would reply in a rational answer, and that would be that. In Vietnam, it was clearly irrational, from our point of view, for those people to keep standing up one after the other and getting gunned down. It was crazy! Why were they doing that?

Gustave H. Shubert, RAND executive,
Interview with Martin Collins, 1992

For many Americans, particularly those who remember clearly the 1960s, the name "RAND" conjures images of the United States' disastrous involvement in the Vietnam War. The Vietnam War was a calamity of vast proportions, taking well over one million lives and leaving a legacy of appalling environmental destruction that will continue to inflict suffering on the Vietnamese population for generations to come. The war cost the lives of more than 58,000 Americans, tore apart the nation's social fabric, and crippled for many their faith in the American government and the righteousness of American values. Public perception of RAND's at least partial culpability for this cataclysm is more generally assumed than understood. Certainly, the man held most directly responsible for American prosecution of the war, Secretary of Defense Robert S. McNamara, surrounded himself with RAND-bred defense intellectuals whose theories on warfare and whose highly-developed worldviews shaped Pentagon policies. Many who opposed the U.S. war effort wondered what sinister jungle weaponries had been conceived in RAND's maze of secured hallways and then inflicted on the Vietnamese countryside. Finally, when Daniel Ellsberg made public in 1971 McNamara's top secret, seven thousand-page study of U.S. involvement in Vietnam—known publicly as the Pentagon Papers—it was from RAND that he spirited his incriminating documents.

Indeed, the RAND Corporation's access during the 1960s to top U.S. defense policy-makers presented an opportunity for considerable influence. On one hand, RAND's indirect impact on U.S. involvement in Vietnam was quite substantial. Many of the Pentagon policymakers who directed U.S. war making in Southeast Asia had spent considerable time at RAND studying Cold War military issues and formulating strategic concepts. As McNamara's staff began focusing attention in 1961 on issues of counterinsurgency and the Vietnam situation, they quickly turned to RAND for analytical support. On the other hand, RAND's direct commitment to Vietnam research and analysis remained a small segment of the corporation's overall effort—never constituting more than twenty percent of the total RAND program and generally averaging around ten percent. Furthermore, the bulk of RAND's Vietnam research concentrated on short-term technical and operational studies carried out at the request of Department of Defense and Air Force clients. In fact, RAND was unable to mount a comprehensive analysis of American policy options in Vietnam until 1968, and it did so then only at the request of the Assistant Secretary of Defense for International Security Affairs. Overall, RAND's ongoing research during the 1960s had little impact on either OSD or Air Force strategies in Vietnam.

The reasons for RAND's surprisingly small program of research on Vietnam are complex but have a great deal to do with the organization's historical focus on "general" nuclear war. From its origins in 1946, RAND had devoted its immense intellectual resources almost exclusively to understanding the complexities of global nuclear warfare. Its programs of research in rocketry,

game theory, physics, man-machine interaction, and social science, for example, were geared towards grasping components of this vast problem set. At the same time, a handful of RAND analysts, including Albert Wohlstetter, Herman Kahn, Bernard Brodie, and William Kaufmann, had achieved national notoriety for their overarching strategic studies of thermonuclear conflict. Even RAND's modest programs of study regarding limited warfare and the tactical aspects of air war concentrated on U.S.-Soviet confrontation in Europe, which was viewed at RAND as the most likely alternative to a full nuclear exchange between the Cold War superpowers. As a result of these biases, when the United States became more deeply involved in a bitter, bloody, and protracted war in Vietnam, many at RAND felt strongly that this was the wrong war, in the wrong place, with the wrong enemy. Unable to escape a worldview dominated by monolithic communism and global containment of the Soviet Union, the preponderance of RAND managers and researchers viewed the struggle in Vietnam as a messy, short-term problem unworthy of RAND's full attention.

This chapter and the next review RAND's involvement in the Vietnam War to 1969. The present chapter focuses on RAND's programs of military research related to the war across this period. The following chapter concentrates on one aspect of this research program – RAND's Viet Cong Motivation and Morale studies. This case study in RAND's Vietnam research program illustrates the profound and destructive impact the war had on RAND and it research community. It also provides critical background to RAND's decision to diversify into social welfare research in 1966.

The Kennedy Administration's Focus on Limited Warfare

Throughout much of the 1950s, President Dwight D. Eisenhower's administration had pursued the military policy of "massive retaliation," under which the U.S. threatened to meet communist aggression anywhere with a massive U.S. nuclear response against the Soviet homeland. By the late 1950s, however, changes in the world strategic situation had undermined the central assumptions of "massive retaliation" as an operative policy. First, the focus of Cold War confrontation was gradually shifting away from a head-to-head U.S./Soviet clash towards limited engagements in "third areas" often fought between "proxies" of the two superpowers. The increasing regularity of such "brush-fire" wars demonstrated the poverty of U.S. threats of massive retaliation. Second, the ongoing process of decolonization in Asia and Africa created power vacuums across wide areas of the globe. Massive retaliation was virtually meaningless as the U.S. and the Soviet Union competed for influence among the emerging nations of the "third world." Finally, the nature of warfare experienced in areas such as Vietnam and Cuba suggested the ineffectiveness of nuclear weapons as battlefield armaments. Diffuse guerrilla insurgency tactics offered few targets of concentrated military significance, while bombing campaigns against the enemy's war-making capabilities were impossible.

In response to these changes, incoming President John F. Kennedy and his Secretary of Defense, Robert S. McNamara, pursued the dual-pronged military policy of building up U.S. nuclear forces while reconstructing the nation's capabilities for waging conventional warfare. Without questioning the validity of monolithic communism and global containment, Kennedy and McNamara worked to affect a massive build-up of nuclear capabilities in order to offset perceived Soviet advantages in missile development. The administration also sought to achieve the capacity for "flexible response"—the ability to wage non-nuclear warfare across a spectrum of circumstances and levels of intensity. Flexible response was the brainchild of U.S. Army General Maxwell D. Taylor, who served as Army Chief of Staff during the Eisenhower administration and was Kennedy's military advisor. In his book, The Uncertain Trumpet, Taylor constructed both

the rationale and operation of flexible response, which focused on rebuilding America's capacity to wage limited, non-nuclear warfare.[632]

With the failure of U.S. policy in Cuba, Vietnam, and elsewhere, the Kennedy administration's flexible response efforts concentrated increasingly on "counterinsurgency."[633] President Kennedy and his advisors were convinced that the Soviet-led Communist bloc had developed a coordinated and sophisticated system of sponsoring aggression in backward economies where conventional military operations were not feasible. These actions, most often executed under the cloak of revolutionary insurgency or wars of national liberation, demanded an American counter-strategy, and counterinsurgency became something of an obsession for Kennedy after the foreign policy reverses he suffered during his first months in office. Specifically, Secretary of Defense McNamara and his Director of Defense Research and Engineering (DDR&E) Harold Brown launched in 1961 a series of initiatives designed to improved U.S. capabilities in this area.

During the summer of 1961 Brown organized a Limited War Research, Development, Test and Evaluation (RDT&E) Task Group and asked the group "to identify deficiencies in present remote area limited war capabilities, and to recommend areas in which increased research and development effort is needed. . . ."[634] To encourage the military services to respond to the task group's recommendations, McNamara applied his most reliable weapon—budget control. In a memorandum to Secretary of the Air Force Eugene M. Zuckert, for example, Brown wrote that McNamara had "withheld $14.8M of Air Force [fiscal year 1962] funds included in the budget add-on for limited warfare . . . with the understanding that they would not be released until a comprehensive review of the services' RDT&E programs for limited war had been accomplished."[635] With McNamara's authority behind him, Brown requested that Zuckert re-examine his present and proposed research and development plans in light of the Task Group report. Thus, the DDR&E's task force report was to serve as the principal planning document for the military services' development efforts.

At the same time, DDR&E Brown created Project AGILE to concentrate the Department of Defense's counterinsurgency research and development efforts. In general, AGILE was intended to correct the long-standing imbalance that saw U.S. scientific efforts devoted almost exclusively to strategic nuclear war issues. For nearly twenty years, the preponderance of U.S. research and development programs had been geared to the development of complex systems designed to destroy the Soviet Union's military potential. Unfortunately, the resulting achievements were of little use to American efforts to support allies against insurgent threats. AGILE sought to rectify this situation, or in the words of the Advanced Projects Research Agency's program description,

> achieve the early definition and solution, through research and development and on-site investigation, of the problems of weaponry, equipment and techniques encountered in selected environments of Southeast Asia. Studies in the field must be conducted which will encompass the entire gamut from the practical optimization of site, weight and range of weaponry to the behavioral sciences and the effects of ecology on combat operations.[636]

Charged with coordinating the administration's "remote area conflicts" research and development efforts, AGILE initially comprised four main components: a combat test facility in Saigon, South Vietnam; a technical field group in Bangkok, Thailand; a support group located in the United States; and an ARPA management function at the Pentagon. The project ran for nearly a decade.

In June 1961 ARPA began operation of a Combat Development Test Center (CDTC) in Saigon staffed by approximately ten U.S. military personnel. The CDTC worked closely with the Army of the Republic of Vietnam (ARVN) to test, under actual combat conditions, various new

counterinsurgency weapons being developed in U.S. laboratories.[637] For example, one of the CDTC's earliest projects was the testing of air-delivered defoliants designed to clear a swath through the jungle alongside roads and waterways as a means of forestalling ambushes. Also, the CDTC assisted in testing the air-delivery of chemicals that would eradicate clumps of manioc trees which had been planted by nomadic farmers but were being used by Viet Cong guerrillas as sources of food. Later, the CDTC engaged in research projects dealing with the development and testing of counter-guerrilla air tactics, cross-country vehicles, silent and portable communications gear, and the employment of local taboos and other psychological weaponry.[638]

A few months later, ARPA also established under Project AGILE a Technical Field Group in Bangkok to identify critical combat problems in Southeast Asia, propose solutions within present or project technologies, identify preferred development projects, and transmit those recommendations to the U.S. This group comprised approximately forty to eighty U.S. and non-U.S. civilian and military experts drawn from a range of disciplines, including operations research, tactical military hardware, and social and political science. The Bangkok team worked in close liaison with the CDTC in Saigon, with tests of devices and techniques developed in Bangkok conducted via the center in South Vietnam. At Brown's request, RAND contributed a handful of personnel to both the CDTC and the Bangkok technical effort, which was initially projected to have an American staff numbering twenty to forty persons as well as an equally sized non-U.S. contingent.

Both the CDTC and the Technical Field Group were supported by a pool of varied scientific and technical experts located in the United States. While the U.S. support group performed specific tasks required by the field teams, such as technical studies, data compilation and computer support, and analytical assistance, it also furnished part of the field group staff on a rotational basis. ARPA officials recruited this support group from non-profit research organizations such as RAND, universities, and industry through a series of conferences and symposiums designed to attract interest. In November 1961, for example, ARPA hosted an all-day meeting of thirty-nine experts to discuss Project AGILE. The day's agenda included briefings on the economic, military, and political situation in South Vietnam and was designed for three purposes: to inform U.S. scientific and technical experts on the nature of low-intensity warfare, to solicit short-term assistance in Southeast Asia field operations, and to recruit long-term commitments of support for AGILE.

Finally, Project AGILE was managed directly by the Office of the Secretary of Defense through DDR&E Brown. In keeping with McNamara's strategy for elevating decisionmaking and management authority to the highest levels of the defense organization, Brown charged ARPA with responsibility for Project AGILE, with the military services providing project officers for the effort. ARPA also handled, either directly or through the services, the necessary contracting for AGILE's supporting research. In managing AGILE, ARPA personnel worked closely with McNamara's International Security Affairs (ISA) office—the assistant secretariat which largely ran American operations in Vietnam. Overall, Kennedy's and McNamara's counterinsurgency initiatives fit a well-defined American defense policy pattern—the mobilization of academic, industrial and government resources in a military-funded effort to find technological solutions to the nation's security problems.

RAND's Early Limited War and Counterinsurgency Research

RAND's involvement in Project AGILE was immediate but, in the context of RAND's overall research efforts, of limited scope. Herken's observation that, "As with the ideas about nuclear strategy, many of the new theories of conventional war had had their origins at Rand,"[639]

is true, but those ideas had emerged from relatively small and, many at RAND would say, rather neglected research programs. The bias of American research and policy efforts toward strategic warfare was deeply ingrained at RAND, and analysts interested in limited warfare studies fought an uphill battle in securing funding for their work. These researchers had begun to explore limited warfare research as early as 1954 near the end of the Korean War. Though not attracting the attention of RAND's nuclear strategists, this work positioned RAND for its participation in Project AGILE—work which initiated RAND's direct involvement in Vietnam.

Following the Korean War, a handful of RAND analysts, most notably Ed Paxson, began arguing that limited wars, like the conflict in Korea, were more likely than general wars to be the pattern of future conflicts. As such, he and others argued that the Air Force should prepare itself to fight not just a global thermonuclear war but wars of lesser and, perhaps, non-nuclear intensity. The proponents of limited war research gained some attention within RAND, but the main thrust of RAND's analytical interests continued to coincide with those of the Air Force, namely, strategic air warfare.

Nevertheless, RAND management devoted a small allotment of funding to limited war studies, and in November 1954 a team of researchers under Paxson's direction undertook Project Sierra—a long-term study of limited warfare based on RAND's gaming techniques. Essentially, Paxson's team attempted to analyze the problems of tactical air war in terms of joint operations with Army and Navy units. The Sierra games continued until 1959, focusing on hypothetical wars in Southeast Asia and the Middle East—areas where political conditions imposed constraints on U.S. basing, deployment, and air operations quite different from those experienced in Europe. To understand these constraints and their significance, the Sierra team attempted to define carefully the political and strategic contexts for their hypothetical wars.

Project Sierra had several principal objectives. First, and most importantly, the games were intended to estimate how the U.S. Air Force would perform under various limited warfare conditions and to suggest optimal tactics and strategies it might employ in such situations. A second objective was the development of limited warfare gaming techniques that might be transferred to various Air Force commands and other groups outside RAND. As the Sierra games progressed, the RAND analysts attempted to specify operational techniques for a range of carefully defined episodes, campaigns, and environments. Paxson hoped that these standardized operating outcomes could be assembled, like building blocks or algorithms, to predict military developments according to most conceivable patterns of military engagement. In essence, Paxson and the Sierra team were undertaking the construction of a tactical air war expert system.

Over the course of the Sierra games, the RAND analysis teams employed five principal gaming methodologies—all of which were based on models of rational choice in which the "rationality" of tactics and objectives for both the American and enemy sides was determined by RAND analysts. First, the teams used the two-sided, free-war gaming, or "map maneuver," methodology employed extensively at RAND.[640] Specifically, during each game the opposing red and blue teams were isolated from each other and exchanged tactical plans through the control group, which served as an intelligence filter, evaluator, and source of political limitations on each player. The control group established the locale, date, and circumstances for communist aggression, but the red and blue teams functioned at all necessary staff and command levels. This intense detail meant that these free games were complicated and time-consuming exercises, often taking several months for a single play, but such games permitted the a wide array of intelligence and tactical considerations.

During the latter stages of a prolonged war game, the Sierra participants sometimes reverted to a second, less time-consuming methodology in which the two sides planned their tactical operations separately and over extended periods of time. Discussion of the plans, resolution of

interplay, and assessment of results were then accomplished in joint discussions around a common map. In the later games of a particular series, the Sierra team adopted a third and even less time-intensive methodology—the seminar game. In seminar games, the opposing teams and the control group worked together around a map. They would propose plans, plot interplay, assess results, all in the open. This permitted great speed in game execution, but it sacrificed detailed analysis since results and projections were largely aggregated. Finally, under repetitive gaming circumstances, the Sierra team used mathematical models to calculate the course and effectiveness of tactical operations while, in nuclear weapons scenarios, the team resorted to computerized models. In the latter method, for example, one model fought an air battle automatically, on an aircraft-by-aircraft basis, while another computed fallout characteristics over a large area so as to determine the enemy's civilian casualties and the risk to neighboring friendly countries.

Crucially, RAND's Sierra and Red Wood games assumed—as all of RAND's war games assumed—that the opposing sides would act as rational decision-makers in selecting tactics, strategies, and objectives. Of course, by "rational" the RAND gamers meant that the two sides would pursue their interests as defined by the prevalent Cold War assumptions regarding communist ideological motivation and global containment.[641] These assumptions underlay the structure and operation of the games and necessarily shaped their outcomes. RAND analysts and consultants directed the military operations of both the blue and red sides, yet in the case of Vietnam at least, they had very little idea of the red side's real configuration or motivations. Furthermore, because RAND analysts assumed that the Soviet Union and, to a lesser extent, the Chinese communists were the primary antagonists in Southeast Asia, the Sierra and Red Wood games functioned more like U.S.-Soviet confrontations. Despite these shortcomings, however, RAND's Sierra war games of the Vietnam conflict yielded prescient insights.

Over the course of Project Sierra, Paxson's team conducted hypothetical limited wars in Thailand, Burma, Vietnam, Taiwan, Korea, and China, generally analyzing both non-nuclear scenarios as well as wars involving tactical nuclear weapons. For Vietnam, the Sierra team conducted games series under three scenarios: a non-nuclear conflict in which the red side adopted large-scale guerrilla tactics, a non-nuclear conflict in which the red side launched a Korea-like invasion of the blue side, and a second formal invasion scenario in which the United States used atomic weapons. Not surprisingly, in the third case, the blue team was able to demolish the red invasion within three weeks using thirty-eight atomic weapons. For present purposes, however, the first Vietnam game series—large scale guerrilla warfare—is particularly interesting because the Sierra games came surprising close to anticipating both the circumstances and the outcome of the Vietnam War.

The Vietnam-1 Sierra war games assumed that the communists had amassed substantial forces in the mountains of South Vietnam and in the swamps west of Saigon. These cadres were left behind by the Vietminh when they withdrew northward in conformity with the Geneva Accords. Gradually, guerrilla reinforcements of these stay-behinds infiltrated from North Vietnam into the South, and the political and military situation there began to deteriorate precipitously. Unable to cope with the communist threat, the South Vietnamese government (GVN) called for U.S. assistance, whereupon U.S. air units and an aircraft carrier task force deployed to Vietnam. The combined U.S. and GVN forces adopted tactics that sought to exploit their air transport and reconnaissance capabilities, and, specifically, employed helicopters to locate, isolate, and attack enemy targets. These tactics were successful in the opening stages of the combat, and the blue forces advanced northward, albeit at progressively slower rates. Within months, the engagement had reached a stalemate with the blue forces stopped at a line abreast of Qui Nhon. Red guerrilla forces remained in control of most of Vietnam, while in those areas nominally controlled by blue, it required the application of all available military and police resources to quell guerrilla

operations. Thus, RAND's Sierra analysts predicted that the best outcome for blue in a non-nuclear conflict was a bloody and protracted stalemate.

Crucially, the Sierra team conducted a variation on this series in which parts of Laos and Cambodia were included in the theater of operations, both as a sanctuary and supply route for Red forces and as a locale for blue interdiction efforts. Under these conditions, which mimicked closely the actual experience in Vietnam nearly a decade later, the red guerrilla forces took over Vietnam at a much faster rate. In fact, even with the application of massive air power by blue forces, the fall of Saigon was imminent within seven months of fighting.

Project Red Wood succeeded Sierra in 1959 and continued to explore limited warfare and tactical air war until 1963, when RAND began a larger Tactical Air Study Project. Also, between 1958 and 1960, RAND undertook a second series of limited war games—Project Back Stop—that focused on the contextual issues of limited warfare. The Back Stop games were directed by Frederick Sallagar, a RAND political scientist from 1952 to 1969, and involved a handful of RAND social scientists and engineers. Back Stop differed from Projects Sierra and Red Wood by concentrating on elaborate political and strategic contexts for hypothetical conventional and tactical nuclear wars. Set in Iran, the Back Stop games reflected the conviction of RAND's social scientists that "the toughest problems in a limited war are those that can not be handled by military action alone. They lie in the field of national policy and require action by the political arm of the government."[642] Still, the assumptions underlying both the Sierra/Red Wood and the Back Stop games were grounded in the global containment/monolithic communism perspective and RAND analysts made no effort to examine the accuracy of these fundamental assumptions.

While neither Project Sierra/Red Wood nor Project Back Stop attracted much attention within RAND or had significant impact on Air Force operations, they reflected a steadily growing concern within RAND that the Air Force was unprepared for limited warfare. In 1957, for example, RAND mathematician Harold I. Ansoff published a research memorandum, "Some Considerations of the Role of the U.S. Air Force in Limited War," in which he criticized the Air Force's disregard for limited warfare preparation.[643] Ansoff found that the U.S. Air Force was "designed almost exclusively" for global war, with the assumption that an Air Force so constructed could also be used for limited wars. He rejected this assumption and detailed the profound strategic and operational differences between global and limited wars. Limited war, Ansoff found, was "a spectrum of many different probable wars each described by a complex combination of geographic, economic, political, and military factors."[644] Compared to all-out nuclear war with the Soviet Union, limited wars were distinguished by their recurrence (global thermonuclear war was not expected to occur more than once), geographic locations, enemy combat postures (e.g., conventional versus guerrilla tactics), and logistics requirements. Significantly, Ansoff's paper was influenced by comments from William Kaufmann, the man who became RAND's leading authority on limited warfare and who strongly influenced Secretary McNamara's defense strategies.

A series of systems analyses begun in the mid-1950s and concerned with the performance of U.S. economic and military assistance programs also helped shape RAND's later work in Vietnam. This work got underway in 1955 under the direction of Charles Wolf, Jr., a Harvard-trained economist who had come to RAND following stints at the U.S. Department of State, the Economic Cooperation Administration, and the Foreign Operations Administration. Initially, Wolf's research focused on the relationship between economic development and political behavior in developing countries.[645] Essentially non-military in nature, this early work was funded by RAND and was the corporation's earliest effort to apply systems analysis to socio-economic problems.

Wolf's first study, published within RAND in 1956, proposed a quantitative model of the relationship between "political vulnerability" and three complex variables: economic aspirations, standards of living, and economic expectations. Arguing that U.S. foreign aid programs were founded on a "presumed connection between economic change and political behavior in the underdeveloped areas of the world," Wolf sought to state that relationship in quantitative terms. In general, his objective was a mathematical model that could be used by policymakers to optimize their decisions about the amounts, recipients, and purposes of foreign aid programs given the goal of political stability. As a by-product, such a model could also be used to predict "extremist" communist political activities by identifying the economic conditions in which communist insurgency tended to flourish.

As Wolf and his colleagues began their work, they quickly recognized that the old foe of systems analysis—the criteria problem—was even stickier in social analyses than it was in military systems analyses. In his report, Wolf commented,

> [W]e are not clear as to how the proximate returns from economic aid, measured in terms of various indicators of economic growth, can be related with any precision to the broader objectives we seek. . . . Without means of evaluating the returns from economic aid, we lack suitable criteria for selecting among alternative ways of using foreign assistance funds.[646]

Thus, Wolf and his team confronted the fundamental problem in applying systems analysis to social welfare problems: how does one measure the output of social programs when their very objectives are politically contested?

Wolf's strategy for coping with this dilemma was to reduce U.S. economic assistance objectives to a single, well-defined goal: the minimization of "extremist" communist political activity. As Wolf reported, "From the standpoint of U.S. foreign policy and foreign aid allocation . . . we can assume that there are many possible political manifestations in sovereign countries which . . . are of little or no concern to U.S. policy planning."[647] Only when a country's internal political affairs "veer in an extremist direction, and only as they discernibly influence the contest or conflict in the international arena," did they become of direct relevance to the United States.

With this in mind, Wolf and his colleagues constructed an "economic index of vulnerability" based on the assumption that extremist political behavior tends to be associated with poverty. The RAND analysts argued that areas in which the disparity between human aspirations and realities was greatest would be most susceptible to communist appeals. By defining both aspirations and realities in terms of economic variables such as per capita consumption, Wolf's group constructed a quantitative framework for measuring them. They then related those values to measurements of political extremism in a mathematical model that described their relationship. As a case study, Wolf collected data regarding economic characteristics and voting patterns in India's first national parliamentary elections, held in October 1951 and February 1952. For India's various voting regions, he and his staff calculated the correlation between the economically-derived vulnerability indexes and the share of votes received by the Communist party. They concluded that the results supported the explanatory power of their vulnerability model.

While this initial project was essentially non-military and funded through RAND's corporate research funds (the "RAND-Sponsored Research" or RSR program), Wolf and his colleagues subsequently shifted their attention to the effectiveness of U.S. military assistance programs, in part so as to justify funding under the Air Force's Project RAND. Over the next few years, Wolf and several other RAND analysts produced a series of reports that served as a model for the application of systems analysis techniques to foreign assistance programs.[648] This research effort

had two objectives: to identify for the countries analyzed military aid programs that would optimize military performance against threats of communist invasion or insurrection and to enhance the favorable economic and political side-effects of military assistance.

In keeping with standard systems analysis methods, Wolf and his colleagues began by surveying the existing U.S. military assistance programs for two case studies: Iran and Vietnam. They then constructed alternative military assistance programs for each. The first of these, the "forces" variant, largely mimicked existing policies by emphasizing the development of fairly large, conventional military forces. The second program alternative, the "infrastructure" variant, cut back support for conventional forces by twenty-five to thirty percent while shifting funds towards the construction of military infrastructure, especially airfields and port facilities, that would support both indigenous forces and U.S. intervention efforts. Wolf and his team then conducted war games, utilizing the Project Sierra/Red Wood staff and techniques, to evaluate the performance of the alternative packages under the specific communist threat conditions prevailing in Iran and Vietnam. These war games were followed by analyses of the economic and political side-effects likely to derive from the alternative programs. Interestingly, Wolf's group concluded that changes within U.S. military assistance packages were largely irrelevant to the outcome of military engagements. Instead, the effects of the U.S. aid programs were overwhelmed by the significance of variables such as existing infrastructure patterns, enemy military capabilities, and the propensity of the local population to support an insurrection. However, the infrastructures program did produce significantly greater economic and political benefits with minimal loss of military performance.[649]

Wolf's pioneering work on economic and military assistance set the stage for RAND's role, after 1960, in coordinating Department of Defense military assistance programs with the economic development programs of the U.S. Agency for International Development (AID). By this time, the United States had large programs of military and economic aid to countries on the periphery of Sino-Soviet territory, especially South Korea, Taiwan, Laos, South Vietnam, Thailand, Pakistan, Iran, Greece, and Turkey. RAND's work focused attention on the relationships between military and economic assistance, assistance planning techniques, and optimization of coordinated DOD-AID aid programs.[650] In 1963, RAND began for AID a program of systems analyses concerning U.S. foreign aid policies and effectiveness. For example, in 1964 RAND sent a team of economists under the direction of Charles J. Zwick to South Vietnam to review U.S. economic assistance programs there and to recommend policy changes. After extensive field investigation in May and June, the RAND team submitted its report, "U.S. Economic Assistance in Vietnam: A Proposed Reorientation," to AID.[651] This research in Vietnam and subsequent projects elsewhere in the world continued throughout the 1960s and provided RAND with pivotal experience in understanding the social bases for insurgency and for applying systems analysis to social welfare issues.

RAND and Counterinsurgency, 1961-64

With the Project Sierra/Red Wood studies and RAND's developing military and economic aid research providing essential background, RAND analysts were involved almost immediately in the Kennedy administration's initiatives on counterinsurgency and "third area" conflicts. During the years immediately prior to the 1965 commitment of U.S. ground forces in Vietnam, a handful of RAND analysts undertook a research program focused on counterinsurgency, with particular attention to Southeast Asia. By 1965, however, RAND's program in counterinsurgency remained surprisingly small, due mainly to the disinterest of RAND's senior management and to Air Force efforts to sidetrack this area RAND's research.

RAND's initial work in counterinsurgency was sponsored by two offices within McNamara's defense administration: the office of the Assistant Secretary of Defense for International Security Affairs (ASD-ISA) and ARPA through its Project AGILE. In early 1961, RAND analyst Henry Rowen had moved to the Pentagon to serve in ISA where he became intimately involved in McNamara's strategy to improve U.S. and NATO capabilities for waging limited war. Rowen's mentor, Albert Wohlstetter, had remained at RAND and formed a critical link between McNamara's OSD and Santa Monica. By June 1961, Wohlstetter had organized and was directing a "Limited War Board" on RAND's Research Council—a board designed to focus RAND's work in this area.[652] His objective was to arrange with Paul Nitze, then ASD-ISA, for a research contract that would support the work of fifty to seventy RAND professionals on problems relating limited war and third area conflicts. As discussed in the previous chapter, however, the prospective ISA contract immediately became a source of intense debate among RAND managers, a considerable number of whom believed the ISA contract would be disastrous for RAND's relations with the Air Force.

RAND's program of research for ISA was designed to identify military force postures and strategies that would best advance U.S. interests in so-called "third areas"—those countries that were allies, satellites, or neutral to the main Cold War powers. The ISA contract was administered by ARPA, due to that agency's official responsibility for all OSD research, and by mid-1963 RAND was expending ISA funds at an annual rate of $900,000. Before 1965, however, RAND's ISA research included very little work related directly to Vietnam, although the general focus on limited war and third areas provided relevant background materials. In 1964, for example, the ISA research program included studies of NATO military policies, "independent" nuclear capabilities, collective security arrangements in Asia and the Pacific rim, and U.S. economic and military assistance in Latin America.[653] Of relevance to the growing Vietnam conflict, ISA sponsored research on the relationship between combat capabilities and logistics support in guerrilla operations, although this work focused on problems in Iran and India.

While the ISA research provided a background of "third area" studies, the bulk of RAND's initial research on counterinsurgency and the Vietnam conflict was performed under the sponsorship of ARPA's Project AGILE. As discussed above, AGILE was organized specifically to focus research and analysis on the deepening conflicts in Southeast Asia. Whereas the ISA studies concentrated on policy and "soft" analyses, AGILE was oriented towards the tactical and technological aspects of counterinsurgency. RAND's efforts began in August 1961 when DDR&E Harold Brown sent RAND a classified letter asking for assistance in setting up the Combat Development and Test Center in Saigon. RAND had had, since 1959, a research relationship with ARPA focused mainly on space and satellite communications as well as arms control research. This relationship had not created problems between RAND and the Air Force since it allowed RAND to act as an Air Force proxy in these developing policy areas. RAND thus quickly agreed to provide support in Saigon and, after a series of meetings with ARPA personnel, established a full-time interdisciplinary research team at Santa Monica to support AGILE. To direct RAND's AGILE team, Frank Collbohm selected Jack W. Ellis, an engineer in the corporation's Aero-Astronautics Department who had worked on Projects Red Wood and Back Stop and who was a long-standing proponent of limited war research.

Ellis's selection to head RAND's AGILE program also reflected the initial nature of the research, which was heavily oriented towards military hardware and operational studies. For example, the two studies underway by the spring of 1962 regarded ground-force communications systems for counterinsurgent operations and the utility of air-delivered micromissiles (flechettes) in Southeast Asian combat. In April 1962, RAND sponsored a symposium of military and civilian experts on the topic of counterinsurgency, but research efforts continued to focus on technical

and operational issues. By the end of that year, AGILE employed approximately eighteen RAND staff members—a tiny portion of RAND's total research efforts—and included work on military lasers, wound ballistics, field communications systems, road capacity and logistics, and acoustic sensors.[654]

The Cuban missile crisis, in October 1962 significantly altered the trajectory of Project AGILE. First, President Kennedy ordered that the geographic scope of the project, which was initially limited to Southeast Asia, be expanded to other parts of the world. In particular, ARPA broadened the program to include research in Latin America, Africa, and the Middle East. Second, ARPA reoriented AGILE away from "hardware" research toward societal analyses. According to RAND's management reports, AGILE would now include "anthropologists, political scientists, etc., who would learn about how we can better understand and influence 'native' attitudes."[655] In response, RAND began engaging academic consultants such as anthropologist Gerald Hickey and political scientists John Donnell[656] and Joseph Zasloff[657] to conduct field studies of social conditions in Vietnam. An example of this new strain of research was Hickey and Donnell's 1962 study of the government of South Vietnam's (GVN's) strategic hamlet program—a report that was highly critical of the GVN and contained rich economic and sociological data on rural Vietnam.[658] Hickey and Donnell's work was the first such policy work done by Americans in Vietnam, and, at roughly the same time, Joseph Zasloff, took up a study of North Vietnam's role in the southern insurgency which likewise offered new insights to the nature of the conflict. Zasloff, a consultant to RAND's social science department, had served as Smith Mundt professor at the Univerisity of Saigon during the 1959 and 1960, and thus brought considerable experience to RAND's analyses. Likewise, Hickey was familiar with Vietnam and subsequently engaged in research on Vietnam's Montagnard tribesmen, while Donnell joined Zasloff in Vietnam to study the morale and motivations of the Viet Cong—work which will be treated in Chapter Nine. Taken together, this body of research, although quite small, quickly began to challenge the orthodox interpretation of the Vietnam conflict that permeated both RAND and the national policy structure. At first, this challenge simmered within RAND's social science department, but by the end of 1965 it was spreading throughout the organization.

As late as 1964, however, and despite the importance placed on counterinsurgency by the Kennedy administration and the availability of ARPA funding, RAND's work in this area remained a small backwater of its research program. As late as 1964, AGILE research continued to occupy the attention of less than twenty RAND professionals, and internal RAND documents relate Ellis's continuous difficulties in finding staff members willing to work on AGILE projects.[659] In large measure, the halting nature of RAND's counterinsurgency work can be traced to stiffening Air Force resistance to RAND's participation in such work and to Frank Collbohm's efforts to repair RAND-Air Force relations after 1961.

During the 1950s and 1960s, the U.S. Air Force was organized principally to conduct large-scale thermonuclear war against the Soviet Union and to deter such attacks on the U.S. homeland.[660] This concentration on strategic offensive function placed overriding emphasis on the service's Strategic Air Command (SAC) while other combat missions, such as air defense and tactical air, were afforded few resources and little attention. At some points during the 1950s, this single-minded focus became so intense that the Air Force terminated development work on conventional weapons altogether, and the Tactical Air Command organized itself as a miniature SAC. Meanwhile, throughout these years the Army developed its own air forces to execute the ground support missions that the Air Force had abandoned. By 1967, for example, fifty percent of all U.S. air vehicles in Vietnam belonged to the army, and the army provided much of its own ground fire-support with helicopter gunships.[661] For the Air Force, counterinsurgency offered little in the way of independent operations and no opportunities to exercise its core doctrinal

theory of strategic air power. Furthermore, guerrilla conflicts such as that in Vietnam did not even offer air superiority missions since the foe lacked modern air assets.

During these years, RAND reflected—and perhaps contributed to—the single-minded Air Force bias towards strategic air warfare. During the Korean War, which like Vietnam was a "limited war," RAND contributed the full-time equivalent effort of just a single staff member for eighteen months. While the Korean experience did stimulate a small amount of interest in limited warfare at RAND, its analysis and research remained geared almost exclusively to strategic nuclear conflict. Counterinsurgency research was especially distasteful to the Air Force since that service seemed to play no independent role in anti-guerrilla operations. Not surprisingly, then, in 1961 RAND devoted just two percent of its Project RAND work (as opposed to ISA- and ARPA-funded research), approximately five man-years, to limited warfare. In 1962 and 1963, total RAND efforts on tactical air war and limited warfare under Project RAND constituted a paltry three percent of the research program with virtually no effort in counterinsurgency.[662]

The only substantive work on counterinsurgency undertaken by RAND for the Air Force before 1965 was performed mainly as window-dressing for the Air Force. As mentioned above, throughout 1961 Secretary of the Air Force Zuckert and top Air Force leaders were under pressure from the Secretary of Defense to demonstrate interest in counterinsurgency. In response, the Air Force asked RAND, in February 1962, to conduct a thirty-day analysis of "sub-limited war" focusing on Air Force roles in counterinsurgent operations and RAND's ability to assist the development of such capabilities. Collbohm assembled a small group of RAND's department heads, placed them under the direction of Hans Speier (Social Science Department), and charged them with fulfilling the Air Force's request. Their product was a paper entitled "Counterinsurgency and Air Power: Report of the RAND Ad Hoc Group," which offered suggestions regarding improving the effectiveness of Air Force operations in guerrilla conflicts.[663] However, neither RAND nor the Air Force chose to pursue further this subject matter, since simply by conducting the cursory study the Air Force had fulfilled its responsibility to McNamara.[664]

Still, by 1962 not all ears in the Air Force were deaf to the ideas of limited warfare and increased operational flexibility. George Tanham, who represented RAND in Washington, reported that four Air Force generals had contacted him on separate occasions to express sincere interest in RAND's work on these matters.[665] More importantly, in July 1962, Collbohm reported that the influential chief of Air Force Systems Command, General Bernard Schriever, was "particularly interested in limited war, both nuclear and non-nuclear."[666] Schriever's growing interest in tactical air power and the Air Force's role in limited warfare took on added meaning in 1963 when he directed Project Forecast—a massive study of the "Air Force of the future."[667] From the perspective of RAND's counterinsurgency and Vietnam research, however, RAND's heavy involvement in Project Forecast had a stultifying effect as, for much of 1963, Forecast absorbed the attention of nearly all of RAND's top analytical talent. Within a year, however, RAND's Vietnam research efforts were back on their feet and continued to grow as U.S. involvement in Vietnam deepened.

RAND's Vietnam Research Program, 1964-1969

In 1964, the conclusion of Project Forecast and the rapidly deteriorating situation in Southeast Asia energized RAND's counterinsurgency and Vietnam research efforts. In November 1963, a South Vietnamese military coup executed with at least tacit support from the Kennedy administration had toppled the government of strongman Ngo Dinh Diem. Although a zealous anti-communist, Diem's repressive actions and the extensive corruption of his regime had

fueled the fires of rebellion in South Vietnam, and Diem had resisted American demands that he reform the South Vietnamese government and ARVN. Just before Diem's assassination, President Kennedy had sent his top military deputies, General Maxwell D. Taylor and Secretary of Defense McNamara, to South Vietnam to appraise the situation. After extensive tours and meetings, Taylor and McNamara reported that "the military campaign has made great progress," but that Diem's intransigence on reform and repressive actions threatened that progress by alienating large segments of the population.[668] They concluded that President Kennedy should "recognize that we would have to decide in 2-4 months whether to move to more drastic actions or try to carry on with Diem even if he had not taken significant steps."[669] In fact, plans for a military coup were well developed by the time of the Taylor-McNamara visit, and on 1 November a group of ARVN generals captured Diem and his brother Ngo Dinh Nhu and brutally murdered the pair in the back of an armored personnel carrier, later reporting that the pair had committed "accidental suicide."

Rather than leading to greater political stability, however, the 1963 coup triggered South Vietnam's descent into political chaos. Over his tenure as dictator, Diem had systematically eliminated all credible opposition, except for the communists, and his death left a political vacuum. A revolving series of ineffective and corrupt military governments held sway after the "accidental suicide" of Diem and Nhu, but these served only to erode further the legitimacy of the GVN. The NLF and North Vietnamese were quick to take advantage of the turmoil despite repeated U.S. warnings that Hanoi stay out. During the spring and summer of 1964, North Vietnam mobilized its regular forces for action in the South and, at the same time, transformed the primitive Ho Chi Minh trail into a modern logistical network capable of supporting the large-scale infiltration of South Vietnam.

By mid-summer 1964, Maxwell Taylor—by then President Johnson's ambassador to South Vietnam—reported that the South Vietnamese government had only a 50-50 chance of surviving the year. With this in mind, Johnson and his advisors began constructing a strategy for applying "graduated pressure" on North Vietnam to dissuade Hanoi's further intervention in the South.[670] This strategy included, first, selective retaliatory air strikes against northern targets, then in January 1965, the initiation of full-scale bombing under operation Rolling Thunder. Despite this demonstration of immense U.S. military power, however, South Vietnam edged ever closer to collapse as communist forces gained control of well over half of the country. It was clear that only direct U.S. military intervention would stave off the destruction of the GVN, and in March 1965 President Johnson made the fateful decision to commit U.S. combat troops to Vietnam.

The deterioration in South Vietnam during 1964 heightened interest within RAND concerning the region and counterinsurgency and led, in October 1964, to Frank Collbohm's appointment of a committee charged with evaluating "RAND's competence to address U.S. security problems in Southeast Asia and to make recommendations concerning RAND's Southeast Asia research program."[671] This committee, under the direction of economist Charles J. Zwick, a member of RAND's research council whose research interests combined urban transportation and logistics problems with studies of U.S. economic and military assistance programs in Southeast Asia. Zwick took an expansive view of RAND's role in national policymaking, and his work on urban transportation had been one of RAND's earliest applications of systems analysis to social welfare issues. Regarding Southeast Asia, the Zwick committee reported,

> We are convinced that there is a great opportunity for RAND once again to enter into an area of national policy in which there is today a considerable vacuum—that of policy, doctrine,

> and techniques related to countering and discrediting revolutionary warfare as a Communist strategy. . . . A significant opportunity to influence policy and techniques is there.[672]

At that time, RAND's research on counterinsurgency under Project AGILE continued to make up only a small fraction of the corporation's total efforts, and as of May 1964, RAND was conducting no direct Vietnam research under Project RAND funding.[673]

The Zwick committee's report discussed a number of potential research areas, but it recommended two for immediate initiation: the field of revolutionary warfare with focus on Vietnam and major U.S. policy alternatives in Vietnam. Previously, RAND's research on Vietnam and counterinsurgency was fragmentary and disjointed in focus. The Zwick committee recommended the integration and expansion of ongoing efforts and the synthesis of completed studies. RAND's work in these fields, the committee believed, should be increased two- or threefold. Indeed, the area of U.S. policy alternatives in Vietnam would appear to have offered a perfect opportunity for RAND to employ its signature systems analysis techniques. On one hand, the report motivated Frank Collbohm to appoint Gustave Shubert to assume overall direction of RAND's counterinsurgency and Vietnam research efforts in 1965. Shubert had spent the previous several years engaged in NATO policy issues and had no experience in Southeast Asian problems. Yet, he was one of the rising figures in RAND's research staff and already had a reputation for effective management skills. On the other hand, the Zwick committee report did not stimulate the large-scale research effort or the "big-picture" systems analyses of American policy options that the committee envisioned, and RAND mounted no systems analysis program regarding U.S. policy alternatives until specifically requested to do so by top Pentagon officials in 1968.

The reasons for this failure are complex. First, as U.S. combat involvement in Vietnam escalated in 1965-1966, RAND came under increasing pressure from both ARPA and the Air Force to conduct short-term, operationally-oriented studies addressing specific technical problems. Such work absorbed the attention of key RAND analysts who might otherwise have worked on more broadly conceived systems analyses. Second, although the Air Force commanders who worked in the Vietnam theater were anxious for RAND's assistance, top Air Force leadership remained adamantly opposed to RAND's suggestions of basic tactical modifications. Perversely, Air Force leaders were concerned that changes made to accommodate Vietnam combat requirements, if proven highly effective, might lead to long-term force structure changes that would diminish the Air Force's independent operating role, especially that of SAC. In particular, Vietnam conditions demanded close coordination with ground operations, a requirement that placed air power under the control of ground commanders. Such tactics might make sense in Vietnam, but they undermined the mission that Air Force leaders had, for more than two decades, worked to elaborate and defend—the Air Force's mission as an independent, strategic force designed to fight a global nuclear war. Finally, although a handful of RAND analysts did undertake research on revolutionary warfare in Vietnam, especially the social and "human factors" involved in such warfare, this research proved to be highly divisive – a development that will be explored in the next chapter. Compounded by the focus-fracturing effect of RAND's diverse program of technical and operational research in support of American military efforts in Vietnam, these deep and often hostile fissures prevented RAND from executing a comprehensive systems analysis of revolutionary warfare or U.S. involvement in Vietnam.

Frank Collbohm's direct exposure to combat conditions further shaped the operational/tactical orientation of RAND's research. In April 1965, just weeks after the first American combat troops had entered Vietnam, RAND's president Collbohm traveled there to survey the situation in person. Collbohm met with a wide range of U.S. and Vietnamese military

and political leaders, and to his dismay, found the situation to be nearly desperate.[674] At the U.S. airbase at Bien Hoa, for example, Collbohm found U.S. A-1 aircraft packed wing-to-wing on the field because the base was nearly impossible to secure against infiltration. In his trip report, Collbohm concluded, "The VC are everywhere." Furthermore, Collbohm found the GVN's pacification efforts to be nearly comical. At one point, he met with U.S. military commander General William Westmoreland and GVN officials to discuss the Chieu Hoi program, which was designed to encourage communist defections. After his discussions, Collbohm wrote,

> Under the Chieu Hoi program they put defectors in these little camps, which are pretty primitive, for 30 days. They teach some of them how to be tailors—the place is already swarming with tailors—and then after 30 days they're released. They have no place to go. They go back to the VC village, or whatever they came from. It's a mess, very poorly run.[675]

Collbohm also found that U.S. military operations were suffering from excessive bureaucratic control from McNamara's OSD, leading to his conclusion that combat operations were being directed by the Pentagon rather than field commanders. In the case of air strikes, for example, Collbohm reported that, "Everything came from Washington: the specific target, what bomb size, how many planes, at what altitude they fly, and from what direction they approach the target. It was all specified in Washington."[676] Furthermore, this extreme degree of centralized control of the war effort—in part, a manifestation of the RAND-bred management systems by then in place in the Pentagon—placed overwhelming administrative burdens on U.S. personnel in Vietnam. In one South Vietnamese subsector, for example, Collbohm found the local chief being advised by five Americans, each of whom was required to submit fifteen to eighteen reports per month to Washington.[677] According to Collbohm, such bureaucratic responsibilities left little time for U.S. advisors to accomplish the real work at hand.

In the months following his trip to Vietnam, Collbohm worked to initiate a program of research that would assist U.S. operations in Southeast Asia. While the Zwick committee recommended that RAND concentrate its efforts on broad analyses of revolutionary warfare and counterinsurgency with long-term implications, the immediacy of military needs in Vietnam and Collbohm's experience there led to RAND's focus on short-term, operationally-oriented studies. Over the next four years, most of RAND's Vietnam research efforts concentrated on the technical, operational and logistical aspects of U.S. military involvement in Vietnam.

This scattered approach meant the continued growth of RAND's attention to tactical air warfare, which had begun largely with Paxson's Project Sierra and Red Wood studies in the 1950s and early 1960s. In 1963, Collbohm replaced Red Wood with the Tactical Air Study Project, a five-year program under the direction of Milton Weiner and Giles Smith designed to improve Air Force competence in tactical operations and to develop an integrated analytical approach to this problem. After the Project Forecast hiatus, RAND's tactical air studies increased rapidly, absorbing thirteen percent of Project RAND funding in 1964. In particular, RAND launched the FAST-VAL (Forward Air Strike Evaluation) project—a computer modeling effort designed to calculate the sortie requirements for attacks against ground forces. While this work initially focused on European needs, FAST-VAL was soon applied to Vietnam operational issues. In the same vein, William B. Graham and Amron Katz completed in late 1964 a report proposing their concept for coordinated offensive ground and air operations in Vietnam—the Single Integrated Attack Team (SIAT). The SIAT concept was based on small ground and air teams working in close combination. The Air Force, however, greeted their report with "little interest and some opposition" because the SIAT concept emphasized the primacy of ground operations in counterinsurgency.[678]

After 1964, RAND's Vietnam research funded via Project RAND gradually expanded, concentrating mainly on operational issues including evaluation studies of U.S. aircraft and equipment in Vietnam, reconnaissance, aircraft survivability, and specialized tactics. Overall, RAND's commitment to tactical air warfare analysis continued its expansion, accounting for the equivalent of thirty-five man-years, or sixteen percent of total Project RAND efforts in 1965. However, the bulk of the Tactical Air Study research remained focused on Europe despite deepening U.S. involvement in Southeast Asia. This reflected continued Air Force and RAND predilections and the reluctance among RAND staff members to engage in short-term studies of military operations such as those demanded in Vietnam.

RAND's most important body of research on Vietnam air operations after 1964 concentrated on the means and effects of U.S. Air Force interdiction and bombing in North Vietnam.[679] The prominence of this work reflected Air Force interest in interdiction and bombing operations—the principal air missions in Vietnam in which the Air Force conducted independent operations. In fact, the problem of eliminating or minimizing North Vietnamese assistance to the southern insurgency had long been a matter of concern at RAND. The Sierra games had illustrated the pivotal role played by sanctuary and border regions in enemy operations and the fundamental problems these presented to U.S. and GVN forces. One of the earliest AGILE projects undertaken at RAND dealt with the border control issue and resulted in a research memorandum published by C.V. Sturdevant in June 1964.[680] Sturdevant's systems analysis of border control described the nature of the problem and performed cost-effectiveness analyses of alternative control systems including barrier mechanisms and patrol ships. Also in 1964, RAND analyst Leo R. Holliday directed a study of road capacities available in Southeast Asia to support a Chinese invasion of South Vietnam and Thailand.[681] Working within the orthodox Air Force conceptualization of air power, Holliday's work laid the groundwork for potential use of strategic U.S. air power to halt a Korea-like Chinese invasion.

Collbohm's trip to Vietnam in 1965 further stimulated RAND's work in the field of interdiction operations. While in Vietnam, Collbohm and several other RAND personnel had gone on a dangerous mission into VC-held territory to inspect a cache of enemy weapons recently discovered by U.S. forces. Flying out of Can Tho airbase in three helicopters, Collbohm's group landed in a remote jungle clearing secured only by four helicopter gunships flying overhead and no ground forces. As the gunships launched rockets and fired machine-guns into the surrounding brush, the RAND team inspected the cache, which included tons of Russian 70mm Howitzer ammunition, hundreds of Russian rifles, several 7.62mm anti-aircraft guns, cases of Czech sub-machine guns, and a number of East German flame-throwers. The size and quality of the VC stash astounded the RAND team members, and Collbohm concluded that the enemy had achieved an elevated level of sophistication.[682] Upon returning to RAND, Collbohm directed that interdiction be given top priority among the corporation's Vietnam air research efforts.

Over the next eighteen months, as many as eighteen RAND analysts produced research papers on various aspects of the interdiction problem. Finally, in late 1967, this work was drawn together in a comprehensive report, entitled "Air Interdiction in Southeast Asia," by G.C. Reinhardt and E.H. Sharkey. Importantly, this report was highly critical of Air Force operations, finding that "air attacks on both interdiction and strategic targets have not, to date, produced any evident weakening of the enemy's will to continue his operations in South Vietnam."[683] At the same time, the RAND study recommended a series of tactical and equipment changes designed to enhance the effectiveness of interdiction operations. Much to the frustration of project leader Edward Sharkey, however, RAND's briefings and papers made no impression on the Air Force.

Concurrent with Sharkey's project, RAND's Economics Department undertook a study of the effects of U.S. bombing on North Vietnam. Originally, this work was a component of a larger

effort conceptualized by the head of that department, Burton H. Klein, whose goal was a comprehensive systems analysis of American use of escalation and military force in Vietnam as an instrument of national policy. However, Klein and the economists were unable to pull off this ambitious project, and the only product published within RAND was Oleg Hoeffding's research memorandum entitled, "Bombing of North Vietnam: An Appraisal of Economic and Political Effects."[684] Similar to Sharkey's experience, Hoeffding found that Air Force bombing efforts had neither prevented North Vietnam from sufficiently supporting the southern insurrection nor inflicted critical disruptions on North Vietnam's economy. Again, this work was critical of Air Force efforts in Vietnam and, since it was performed under ISA funding and reported directly to the Secretary of Defense, contributed substantially to further erosion of RAND-Air Force relations.

In fact, Klein's abortive efforts and Hoeffding's research memorandum set the stage for a research program that would have catastrophic effects on the RAND's relations with the Air Force. By 1967, Harold Brown had moved from his position as Director of Defense Research and Engineering to replace Eugene Zuckert as Secretary of the Air Force. Unsatisfied with Air Force responses to his inquiries regarding interdiction, Brown invited RAND to lead a joint study with the Air Staff's Operations Research Office into the effects of air power on interdiction and infiltration and on North Vietnam's war efforts. This study is discussed in detail in Chapter Eleven, below, because of its severe impact on RAND-Air Force relations. In general, the air effectiveness study was RAND's largest single study effort on Vietnam, requiring the services of thirteen professionals during the first half of 1968. It found that the interdiction campaign had not achieved its principal objective—cutting off North Vietnamese support of the war in South Vietnam. Further, the study revealed the ineffectiveness of strategic bombing in limiting North Vietnam's capacity to continue the war and implied that Air Force studies to the contrary were, at best, mistaken. The RAND team's summary report and ten volumes of supporting materials were presented to Brown and top Air Force officials in September 1968, engendering a vitriolic reaction from the Air Force and a near collapse in RAND-Air Force relations.

Vietnam Alternatives Study

Although RAND's Vietnam research program continued well into the 1970s, it reached its high-water mark, rather anticlimactically as it turned out, with the Vietnam Alternatives Study performed in 1968. This project, executed at the request of ASD-ISA Paul Warnke, was RAND's only attempt at a comprehensive analysis of U.S. options in Vietnam, and it had minimal effect on U.S. policy. The Vietnam Alternatives Study began in early 1968, some of the darkest days of American involvement, under the direction of Gustave Shubert when Warnke asked RAND to study alternatives to the U.S. strategy of attrition in Vietnam.[685] Keeping in mind the deep divisions raging within RAND concerning the Vietnam War, Shubert organized two teams of analysts with opposite views on the conflict. The first team was headed by Richard Rainey, a "hawk" who believed that American intervention was justified and that U.S. forces should remain in Vietnam until some sort of victory was achieved. Konrad Kellen directed the second team since he had already concluded that no U.S. victory was possible. Having assembled these teams, Shubert charged them with recommending policies and resource commitments that would achieve their respective goals.

In November 1968, Shubert, Rainey and Kellen presented their findings to Warnke and a few top-level members of his staff. The RAND team presented their audience with three options: the current U.S. strategy of attrition, a "population protection" strategy, and a strategy of extrication.[686] Shubert presented the attrition strategy as the base case, since it reflected the then-

current American policy in Vietnam. He argued that by RAND's calculations, enemy losses suffered at 1967 rates easily could be replaced by the combination of infiltration from North Vietnam and recruitment in the South. Shubert estimated that even if the U.S. doubled the attrition rate inflicted on its enemies—a strategy that would require the commitment of over one million U.S. troops to Vietnam—infiltration alone could make up the losses. Further, the enemy's control of battlefield initiative meant that they could manage their level of losses regardless of U.S. tactics.[687]

Richard Rainey then elaborated RAND's population protection strategy—essentially RAND's "stay" option. Rainey's plan was designed to erode enemy political structures and popular base of support in South Vietnam while reducing U.S. costs to a sustainable level. The components of this option included constant, high-visibility military presence at the village level, integration of village defenses into a larger system of military operation, aggressive police actions against National Liberation Front political structures, long-range strike teams and highly mobile counter-guerrilla units, and what Richard Nixon later came to call the "Vietnamization" of the conflict. At best, however, Rainey's proposal would lead to a prolonged stalemate, albeit at lower cost levels, with the goal of strengthening U.S. and South Vietnamese negotiating positions.

Noting that some RAND people believed that Rainey's strategy, even if implemented fully, would prove inadequate, Shubert introduced Kellen's extrication alternative—the liquidation of U.S. military involvement in Vietnam at minimal political cost. Specifically, Kellen proposed that the United States communicate to Hanoi its intention to eliminate "completely and expeditiously" its military presence in South Vietnam provided that North Vietnam adhere to a set of minimum demands. These demands included the release of American POWs, restraint from interference with withdrawal operations, and a cease-fire of sufficient duration to permit the extrication of U.S. forces and a "reasonable interval" between that withdrawal and further military actions against the GVN. In essence, the extrication alternatives would "leave the GVN to survive as best it can" with continued American economic and military aid but without direct U.S. involvement. Finally, Kellen suggested that the U.S. offer substantial economic aid to North Vietnam as a "carrot" to encourage acceptance of the plan as well as adherence to the terms of American withdrawal. In his presentation, Kellen dismissed the long-held "domino" theory that had drawn the United States into Vietnam: "(1) the situation in Vietnam developed out of circumstances unlikely to be duplicated elsewhere by the Communists; (2) the American withdrawal from Vietnam would not <u>by itself</u> create sufficient conditions for successful Communist insurgencies in other parts of Southeast Asia, with the probable exception of Laos."[688] Although the RAND team did not explicitly recommend the extrication policy, the text of their briefing makes clear their sense that it was likely the only real option.

By November 1968 a transformation of the political situation in Washington had nullified RAND's ability to influence top-level Vietnam policy-making. This transformation had begun two years earlier when former presidential science advisors Jerome Wiesner and George Kistiakowsky had assembled forty-seven academic scientists at Wellesley, Massachusetts, to search for new ideas regarding the Vietnam War. Their report to Secretary of Defense McNamara, named the "Jason" study after the division of the Institute for Defense Analyses that hosted the conference, severely criticized the U.S. war effort. The Jason scientists found that the body counts used by the administration to measure progress in the war were greatly inflated and that the American bombing campaign had been ineffective.[689] Gradually, McNamara's civilian aides lost faith that the United States could achieve a decisive victory, and their gloom spread to the Secretary himself. In late 1967, President Johnson ousted Secretary of Defense Robert McNamara, largely due to McNamara's disillusionment with the Vietnam War effort.

McNamara's successor, Clark Clifford, quickly came to share the pessimistic attitudes held by the civilian advisors he inherited, but Clifford and his staff could do little to alter Johnson's stubborn policymaking. Despite a consensus of opinion among top defense policymakers, Johnson refused to become the first president to lose a war by withdrawing from Vietnam. Instead, he withdrew from the 1968 presidential race as his administration was engulfed in a crescendo of anti-war protest.

Just a few weeks before the RAND briefing, Republican candidate Richard Nixon had won the presidency with promises of a "secret plan" to end the war, thereby making RAND's OSD audience into lame ducks. Shubert recalled that at one point during the RAND briefing, one of the attendees remarked, "We know we've got to get out of there. There's just nothing we can do to make that decision."[690] Following the RAND briefing in November 1968, Warnke and his staff politely offered to pass the report on to the new administration, but they offered little hope for its having significant impact.

The study's ineffectiveness was confirmed a few months later when Henry Kissinger traveled to Santa Monica to hear the Vietnam Alternatives briefing. Kissinger, who would soon be named President-elect Nixon's National Security Advisor, sat patiently through talks by Shubert, Kellen, and Ellsberg, but remained unmoved by the analysis. Shubert recalls,

> He sat in that room and . . . he kept nodding and nodding, and every once in a while he'd shake his head. And after it was all over, he said, "I hear what you're saying. . . . But there's just no way we can lose that war."[691]

For the next six years, Kissinger and President Nixon conducted foreign policy largely without the input of Department of Defense civilians—a dramatic reversal of procedures during the Kennedy and Johnson administrations. RAND analysts no longer had the ear of those individuals directing U.S. policy in Vietnam. Subsequent to the air effectiveness and Vietnam Alternatives studies, RAND's work concentrated on the less politically-sensitive technical aspects of the war, such as bombing accuracy, improved navigation, the use of field sensors to create barriers to infiltration, and the interdiction of truck traffic. Tragically, it took five further years of bloody struggle and several hundred thousand deaths before Nixon and Kissinger arranged the extrication of American forces largely under the conditions proposed in November 1968 by RAND's Vietnam alternatives team.

Conclusion

The Vietnam War was a wrenching experience for the RAND Corporation. Not only was RAND largely unable to bring the full force of systems analysis to bear on the broad issues of the Vietnam War, the war severely damaged the credibility of RAND's signature approach to defense policy analysis. RAND analysts and RAND analytical methods formed the core of Robert McNamara's "revolution" in Defense Department management during the early 1960s, and they cannot be separated from the most important operation undertaken by the Pentagon during that decade—the Vietnam War. On one hand, senior advisors to McNamara, such as Assistant Secretary of Defense for Systems Analysis Alain Enthoven, claim that systems analysis was not used to any meaningful extent in formulating Vietnam strategies.[692] In fact, Enthoven argues, "Systematic analysis was a major missing element in understanding what the United States was doing in and to Vietnam. In Vietnam, no one insisted on systematic efforts to understand, analyze, or interpret the war."[693] In part, the record of RAND's Vietnam research bears this out. RAND's best research efforts—the work of Zasloff, Donnell, and others on the social bases of the

conflict, RAND's analyses of Air Force interdiction and bombing campaigns, and the 1968 Vietnam options study—pointed out severe deficiencies in U.S. policies. However, American policies concerning bombing and intervention in Vietnam were made as the result of *political* considerations not careful analyses, and these RAND studies had little influence on policy decisions.

On the other hand, the management and policy methods that characterized Robert McNamara's defense administration were largely RAND's methods, and McNamara was one of the least successful Secretaries of Defense in American history. In his penitent book, In Retrospect, McNamara itemizes the failures of his administration in formulating Vietnam policy. Foremost among these failures are misjudgment of the motives and intentions of America's adversaries, misjudgment of the political forces at work within Vietnam, underestimation of Vietnamese nationalism, and a "profound ignorance of the history, culture, and politics of the people in the area."[694] These failures reflected the oversimplified worldview—a view dominated by monolithic communism and the "domino theory"—that prevailed within RAND and throughout the U.S. defense community before 1965. This simplified view permitted the mathematical operation of rational analysis by dispensing with much of the real world's messiness, but it proved disastrous in practice.

Furthermore, Johnson's and McNamara's failed strategy of "graduated pressure," under which the United States gradually intensified bombing of North Vietnam as a means of "signaling" American intentions emerged largely from strategy work performed at RAND. RAND's analyses had always been set on a foundation of rational decision-making—the assumption that U.S. and Soviet policymakers would pursue their respective interests with careful, logical calculation. As such, precisely calculated "signals" between adversaries played a key role in RAND's strategic simulations and studies, studies that deeply informed the thinking of men like Enthoven and Rowen who became senior advisors to Secretary McNamara. In particular, signaling was the focus of work performed by Thomas C. Schelling, a Harvard economist who spent his summers at RAND during the late 1950s and early 1960s. Having spent his early professional career negotiating international trade and economic aid agreements, Schelling was interested in studying the art of bargaining. In RAND's rich, military-focused intellectual environment, he elaborated his ideas by placing them into the context of the ultimate form of bargaining—thermonuclear warfare.

After publishing a number of working papers within RAND, in 1960 Schelling compiled his thoughts in a widely read book, The Strategy of Conflict, which argued that warfare was, fundamentally speaking, a "particularly violent form of bargaining."[695] Whereas the massive retaliation doctrine of the Eisenhower years was a reflexive, thoughtless strategy—Kahn's "wargasm"—Schelling conceived of limited warfare as a calculated, manageable process of bargaining in which violence was applied or withheld with surgical precision. Crucially, Schelling's warfare was carried out between rational and predictable opponents who utilized "signaling" as their medium of communication.

As American involvement in Vietnam deepened during the early 1960s, Schelling's ideas proved to be exceptionally influential. In 1961, ASD-ISA Paul Nitze offered Schelling a position as his deputy for arms control. Schelling declined Nitze's invitation, but recommended his old friend John T. McNaughton for the job. McNaughton, however, had little experience in arms control negotiation and accepted the position only with Schelling's promise of close counsel and support. Thus, as the inexperienced McNaughton took up his positions, first as Nitze's aide, then as his successor as ASD-ISA, McNaughton relied heavily on Schelling's strategic insights.[696]

In particular, Schelling impressed upon McNaughton his theories of escalation and signaling —theories that eventually underlay McNaughton's and McNamara's disastrous policy of

graduated pressure in Vietnam. Unfortunately, Schelling's and RAND's assumptions of "rational" decision-making were irrelevant in Vietnam, where, by McNamara's admission, American policymakers had little idea of what was actually going on. As the epigraph to this chapter illustrates, the course of events in Vietnam dismayed RAND's analysts and discredited their notions that warfare could be managed with the mathematical precision of a Ford automobile assembly line. As Shubert recalled, "when you start to question that—we're ringing your phone, but nobody answers—that caused them to doubt the applicability or the validity of the methodology."[697]

RAND's experience with the Vietnam War also raised the issue of RAND's appropriate role in wartime. During the 1940s, RAND had been created largely to harness American scientific and social scientific expertise to military problems in peacetime, when it was assumed that the preponderance of top-flight academics would not work directly for the military. In keeping with this, RAND's self-definition revolved around a concentration on long-term policy issues, especially the application of systems analysis to future military problems. Testifying before the Military Operations Subcommittee of the House Committee on Government Operations in 1962, for example, Frank Collbohm described RAND's work as, "long-range research and analyses, largely on defense matters, as an aid to strategic and technical planning and operations."[698]

In wartime, however, RAND's long-term research orientation was in limited demand by the corporation's clients. As the Vietnam conflict deepened, both the military and civilian offices of the Department of Defense focused on the immediate requirements of the conflict. As such, they demanded quick, short-term solutions to mainly technical and operational problems. During the first three-quarters of 1966, for example, RAND undertook an extraordinary 148 projects as "special requests" from various Air Force commands relating to Vietnam needs.[699] RAND responded to such needs, on one hand, by establishing a significant presence in the theater of operations, assigning as many as fifteen researchers to Vietnam at a given time. On the other hand, RAND's Vietnam research program concentrated heavily on technical and operational issues rather than on longer-range policy considerations. As Goldberg observes, this enmeshed RAND in the "intensity and urgency" of wartime operations, and "RAND sometimes found itself caught between two or more agencies or even competing in some way with one or more such agencies."[700] Such entanglement further eroded RAND's professed objectivity of analysis—a circumstance illustrated most effectively by Gouré's prosecution of the Viet Cong motivation and morale studies—and damaging RAND's long-term advisory relationships in the process.

Finally, the Vietnam War pointed with great clarity to the intellectual limitations imposed on RAND by the Cold War. RAND staff members had long prided themselves on a self-depiction of RAND as an iconoclastic organization poised to deliver unpopular but objective analyses to its clients. During the Vietnam conflict, RAND analysts did offer careful and extensive critiques of Air Force operations, such as Sharkey's bombing and interdiction studies. Yet, these studies—powerful as they were—were operational analyses of certain aspects of the conflict. In a larger sense, RAND had great difficulty shedding the orthodox assumptions that pervaded the American policy-making community regarding monolithic communism and the domino theory. The organization and its staff were simply too deeply embedded in orthodox Cold War thinking to examine critically such prevailing assumptions during the critical years of Vietnam policy formulation. The inaccuracy of these assumptions severely distorted RAND's early studies of Vietnam, and their gradual erosion by a handful of analysts created substantial turmoil within the organization.

The emergence of this turmoil and the deep divisions that emerged within RAND by the mid-1960s are the focal point of the next chapter. By this time, the RAND organization was profoundly experiencing the insidious effects of the Vietnam conflict. Just as the Vietnam War

had begun by 1966 to cut grievously into the American social fabric, intense personal and ideological differences threatened to shatter the collegial environment within RAND. To a large extent, this divisiveness emanated from RAND's Social Sciences Department, where a series of Vietnam studies had fractured the research staff into bitter factions. At the core of this controversy lay RAND's Viet Cong motivation and morale studies—a seemingly innocuous program of work that catalyzed a deep rift within the organization's research staff. The next chapter takes up this research program and its impact on RAND's research community.

Back to Table of Contents

Chapter Nine
Vietnam War's Impact on RAND, 1962-1966

To understand the Vietnamese conflict in which by 1964 the United States became mired, one must survey the long patterns of Vietnamese history—a fact that was unappreciated by most American policymakers until it was far too late.[701] Over hundreds, if not thousands, of years, the Vietnamese people repeatedly had defended their independence against foreign powers of apparently overwhelming size and technological superiority. As early as 111 B.C., China had invaded and seized control of the fertile Red River delta—the core of Vietnamese civilization. After numerous unsuccessful rebellions, the Vietnamese finally threw off the Chinese yoke in 939 A.D. and defended their independence against vast odds for nearly one thousand years.

During the nineteenth century, Vietnam again came under the rule of a foreign aggressor, but this time the external power was European rather than Chinese. In 1861, a fleet of seventy French warships carrying 3,500 soldiers seized the cities of Danang and Saigon and gradually began asserting French colonial control over all of Vietnam. French control was formalized in 1884 when the Treaty of Hue established a French protectorate in Vietnam. Vietnamese independence—defended for so many centuries against Chinese intrusions—was lost.

Throughout the first half of the twentieth century, Vietnamese nationalists struggled to keep alive hopes of independence in the face of brutal French rule. By the mid-1920s, the most active of these nationalists was Ho Chi Minh, the son of a poor Vietnamese family who had traveled the world as a sailor on French merchant ships. Ho had come into contact with the ideas of Marxism and Leninism while in Paris during the early 1920s, and he had been one of the founders of the French communist party during his stay in France. After more travels, including visits to the young Soviet Union, Ho returned to Vietnam in 1926 intent upon achieving independence for his nation. Indeed, over the remaining forty-three years of his life, Ho worked tirelessly towards that end.

American involvement in Vietnam began during the closing months of World War II, when U.S. Army officers and intelligence agents assisted Ho Chi Minh's rebel forces in destabilizing the Japanese army, which was then occupying Vietnam. The Japanese had driven out the French colonial government earlier in the war, and Ho's forces took advantage of the gathering Japanese defeat to establish Vietnam's independence. France, however, was unwilling to let go of its former colony so easily and, in 1946, began military actions in Vietnam designed to reassert control. By January 1947, the First Indochina War was fully underway with large French forces, increasingly bankrolled by the United States, pitted against Ho's Vietminh forces throughout the country.[702] Gradually gathering strength and territory, the Vietminh wore down the French with elusive guerrilla tactics and fierce determination. By early 1954, the French were exhausted, and a military disaster at the French outpost of Dien Bien Phu brought the war to an end.

Given its initially favorable relations with Ho Chi Minh and its historical anticolonial stance, the United States' decision, first, to acquiesce in French recolonization efforts and, later, largely to sponsor those aggressions might appear puzzling. As would be the case with much of subsequent U.S. policymaking in Vietnam, the American decision was predicated not on the circumstances in Vietnam, but on the course of events elsewhere. By 1947, the United States had committed itself to the political containment of the Soviet Union, and France was believed by U.S. policymakers to be an invaluable bulwark against the westward expansion of Soviet influence in Europe. As such, the United States was unwilling to alienate France by resisting that country's ambitions in what appeared to be a meaningless backwater of the world.

By 1950, however, American foreign policy had shifted dramatically in response to the course of world events. Soviet demonstration of nuclear capabilities and the "loss" of China to the communists in 1949, along with the North Korean invasion of South Korea in1950, had triggered U.S. adoption of a global containment policy. American policymakers reconceptualized the Soviet political threat as one of a "communist bloc" of nations under the direct control of the Soviet Union. The invasion of South Korea by the Soviet-armed and trained North Korean army in 1950 seemed to substantiate this theory. The conceptualization of "monolithic communism" would dominate American foreign thinking for many years and yielded a mentality among U.S. leaders that a communist advance anywhere in the world was a threat to American national security. Viewed through this lens, Vietnam became not a colonial backwater but the front line in the fight to contain Soviet-directed communist aggression. As such, the United States committed great amounts of treasure to the French effort to recolonize Vietnam, and President Dwight Eisenhower seriously considered American military intervention in 1954 when French defeat was assured.

The Geneva Accords, which ended the First Indochina War in 1954, were viewed by American policymakers as a victory for communism.[703] In actuality, Ho Chi Minh's Soviet and Chinese allies may have abandoned him, forcing the Vietminh to accept immediate independence for only the northern half of Vietnam while the vanquished French retreated into the southern portion of Vietnam and conducted an "orderly withdrawal." Ho accepted this settlement under Soviet and Chinese pressure with the agreement that elections would be held to reunite Vietnam under one rule in 1956. There was little question that Ho, who was by this time a national hero of epic proportions, would easily win such an election.

The United States had expended more than $2.6 billion between 1950 and 1954 trying to prop up the French recolonization efforts, and President Eisenhower was already coming under heated attacks for having "lost" northern Vietnam to the communists.[704] Having stated publicly that Vietnam's fall would have consequences "incalculable to the free world," Eisenhower set about to construct in southern Vietnam a non-communist state that could resist unification with Ho's newly independent Vietnam.[705] This new state, South Vietnam, came under the leadership of the fervent anti-communist Ngo Dinh Diem, who, in 1955 with U.S. support, formally canceled the reunification elections required by the Geneva Accords. Over the next eight years, the Eisenhower and Kennedy administrations poured massive amounts of military and economic aid into South Vietnam hoping to construct a viable state.[706]

In reality, South Vietnam may have gained legitimacy as a nation only in the eyes of American policymakers. While Diem was a dedicated Vietnamese nationalist, his brutal repression of the remnants of Ho's political organization in South Vietnam alienated large portions of the population. Furthermore, generous American support of Diem made it easy for Ho to depict the South Vietnamese government as a puppet of a new colonial power—the United States. In 1959, the North Vietnamese announced the formation of a new organization to conduct the struggle for reunification in the South—the National Liberation Front (NLF)—and the start of a two-pronged revolutionary campaign.[707] First, veterans of the war with the French who had remained in South Vietnam would take up arms in a guerrilla struggle against Diem's government. Also, northern cadres, many of whom were of southern origin but had moved northward in 1954, would infiltrate back into South Vietnam. Together, these forces would conduct a campaign of terror against the South Vietnamese government while the NLF appealed to popular support with promises of land reform, local rule, and independence. The combination of these tactics proved highly effective, and by 1963 the Diem regime was on the brink of collapse.

Through a Cold War Lens: The Vietnam Orthodoxy

American policymakers, including the policy analysts at RAND, viewed events in Vietnam through the lens of global containment and thus failed to understand the complex forces at work. One reason for this misconception was an almost total lack of understanding among U.S. policymakers of Vietnamese history and culture. In fact, when RAND attempted to recruit a Southeast Asia expert for its Social Science department in 1960, it could locate only four suitable candidates throughout American academia.[708] Failing to grasp the complexities of the Vietnamese struggle for independence, U.S. policymakers blindly applied Cold War assumptions to the situation in Southeast Asia. They thus constructed an interpretation that conformed to the larger U.S.-Soviet confrontation but bore little resemblence to the specific situation in Vietnam. Although this orthodoxy was not created at RAND, it pervaded the research staff and dominated the organization's early perspective on the Vietnamese conflict and American involvement.

A report written in 1962 on Southeast Asian war games held at RAND offers a succinct statement of this orthodox interpretation. "Limited War Patterns: I, Southeast Asia (1963)," written by W.H. Hastings, summarized the outcomes of hypothetical wars in Vietnam played out at RAND under the sponsorship of the Assistant Secretary of Defense for International Security Affairs.[709] Of particular interest, the report included an appendix entitled "Indochina and the Communist Bloc—A Postwar Historical Summary," that expressed the prevalent assumptions regarding the emerging Vietnam conflict. Most importantly, Hastings's historical summary placed the insurgency in Vietnam squarely within the framework of a global confrontation between the United States and a communist bloc dominated by the Soviet Union. His essay begins: "It is generally accepted without debate by adherents of the Western philosophy that Communist bloc hopes (if not intentions) include the extension, in the not-far-distant future, of the domination of the Communist ideology and system to Southeast Asia. Since World War II, the pace of effort to achieve this has been irregular [and] controlled predominantly by the Soviet Union. . . ."[710] Subscribing to conventional Cold War thinking, Hastings assumes that following World War II, the Soviet Union had relentlessly pursued a "cold-war expansionist policy" marked by a string of aggressions in eastern and southern Europe and, most recently, in Asia. He thus characterizes the Vietnam conflict as the latest in a string of Soviet-led aggressions motivated primarily by the imperatives of communist ideology.

The core of Hastings's historical analysis is the notion of a monolithic communist bloc that was driven by ideology and capable of closely coordinated action on a global scale. Reflecting beliefs that were widely held both within RAND and throught American policy-making circles, Hastings argued that since 1954, this Soviet-led bloc had concentrated on "limited, local, tactical" aggression due to the communists' fear of triggering a general nuclear war with the United States. With regard to Asia, Hastings wrote, "the choice of opportunities for tactical advances apparently was achieved through consultation between the Asian Communist powers and the Soviet Union."[711] This viewpoint led Hastings, like most American policymakers, to the conclusion that the Vietnamese insurgency was an act of communist aggression that was under the ultimate direction of the Soviets and supported by their Asian lackeys, the Chinese communists.

Hastings's account of the events in Vietnam expresses the subtle yet crucial manner in which American understanding of the Vietnam situation was distorted by this overarching world-view.[712] Most importantly, Hastings gave little credibility to Ho Chi Minh as an independent actor or to Vietnamese nationalism as a motivating force. The RAND report depicts Ho Chi Minh as a "Communist guerrilla leader"—who took advantage of growing Vietnamese nationalism during World War II to seize control of much of Vietnam as Japanese occupation forces withdrew. Rather than portraying Ho as a popular national hero struggling with few resources against

French colonial power, the RAND summary describes Ho's Viet Minh forces as grinding down the valiant French Expeditionary Forces with material and financial support of the Chinese communists.

According to Hastings's orthodox understanding, French defeat forced the United States to extend its "worldwide 'containment' alliance system" to the region to forestall further communist expansion in Southeast Asia. The threat of a U.S. collective security system brought the communist bloc to the conference table in Geneva where the Soviets and Chinese decided "to close off the Vietminh victory in Indochina short of its goal; i.e., this loss was taken in order to forestall the creation of SEATO [the Southeast Asian Treaty Organization]." However, American interests at Geneva were frustrated by the duplicity of the British and French: "There is evidence of an understanding between the Communist bloc and the Anglo-French negotiators at Geneva with respect to the price for impeding the American proposal . . . to extend the Western security system to Indochina." Hastings does not speculate as to British and French objectives in this collaboration. Indeed, according to the RAND analysis, the Geneva Accords were largely a farce which served communist interests, after which "the Vietminh confidently expected to acquire control of South Vietnam by rigged plebiscite in 1956, and . . . to have established an effective control over [Laos and Cambodia] . . . by the date of the 1956 Vietnam plebiscite." Only the creation of SEATO and the cancellation of the 1956 elections prevented this ultimate communist victory.

Hastings's account of events following the Geneva conference continues to assign principal agency to the Soviet Union for events in Vietnam. Hastings's historical summary describes North Vietnamese efforts, over the five years following the Geneva conference, to build up its proxy forces in South Vietnam, the Viet Cong, and train a new generation of revolutionary insurgents. However, Hastings argues that more aggressive actions by the North Vietnamese and the Viet Cong had to await Soviet approval. This approval was delivered, according to Hastings's account, in 1961 when the Soviet Union communicated to the North Vietnamese that it would "permit the acceleration of the Viet Cong operation in South Vietnam."[713] This Soviet decision to restart Communist aggression in the South, the RAND report assumes, was driven by the Soviets' initial successes in the 1961 Berlin crisis and the "U.S. failure in Cuba." The conventional view thus connects the course of events in Vietnam directly to events occuring in Europe and Latin America. The RAND history concludes that Soviet and North Vietnamese objectives, which were largely indistinguishable from each other, were "to hasten the process of collapse of the American system in Southeast Asia, now apparently inevitable."

Finally, Hastings's analysis accentuated Vietnam's strategic importance to American national security by placing it within the rubric of the "domino theory." The Cold War orthodoxy assumed that communist bloc objectives were to achieve world domination via piecemeal aggression wherever the United States appeared to be weak. Communist success in one country would lead to a chain reaction of aggression in neighboring areas, with non-communist nations falling under the Soviet sway like dominos tumbling one after the other. Hastings succinctly laid out the operation of this "domino theory" in Southeast Asia:

> Should [Vietnam] fall under the effective control of the Communist bloc a wedge would be driven between the American position in the Western Pacific and South Asia. Malaya and Thailand could not be expected to maintain their present [pro-U.S.] alignments, one as an American ally, the other as a quasi-ally of the United States, a member of the Commonwealth. The Indonesian capacity to work both sides of the street would be ended; the long investment by the Communist bloc in that country would ripen into bloc control. Burma, the gateway to India, like Thailand, without the assurance of a balance of power in

> the region, would find it very difficult indeed to withstand pressure for conformity to Communist programming.
>
> The next steps, to the east and west, would open South Asia to the Communist bloc and would end the present effectiveness of the ANZUS arrangement as far as Asia was concerned. With the Communist pressures that could then be generated, the Philippines and Japan would find it extremely difficult to maintain their U.S. orientation.[714]

Thus, the domino theory provided a powerful justification for the strategic importance of Vietnam to U.S. national security. In historian George C. Herring's words, the American disaster in Vietnam was "a logical, if not inevitable, outgrowth of a world view and a policy—the policy of containment—that Americans in and out of government accepted without serious question for more than two decades."[715] Lacking real understanding of the circumstances in Vietnam, RAND's respected analysts offered no alternative to this orthodoxy as newly-elected President John F. Kennedy elevated Southeast Asia to the center of national policy attention in 1961.

The Viet Cong Motivation and Morale Studies, 1964-1969

RAND's studies of Viet Cong motivation and morale, begun in 1964 under the sponsorship of ASD-ISA, emerged as the largest ongoing RAND effort on Vietnam. Concentrated in RAND's Social Science Department, the work originally was designed to answer the question, "Who are the Viet Cong and what makes them fight?" Very quickly, however, the project's focus shifted towards exploring the effects of U.S. military operations, particularly air operations, on the Viet Cong and North Vietnamese fighting in South Vietnam. As the motivation and morale studies proceeded, they generated a series of severe problems within RAND. First, the manner in which a handful of RAND analysts conducted later stages of the motivation and morale studies and the zealousness with which they disseminated their dubious results generated intense debate within RAND and, eventually, drew the attention of congressional critics. Second, the social analyses that both preceded and underlay the motivation and morale studies called into question basic assumptions that permeated RAND concerning the nature of the Vietnamese conflict. These assumptions included the very morality of U.S. involvement in Vietnam, and the resulting polarization of RAND's staff according to these issues introduced to RAND the same divisions that were tearing apart American society.

In 1963, as ARPA was reorienting the Project AGILE agenda towards behavioral and social analyses of the conflict, Frank Collbohm sent Guy Pauker, the head of Southeast Asian studies in RAND's Social Science Department, to Washington to scout Pentagon and State Department research needs in Vietnam. Pauker quickly set up an appointment with William Sullivan, the State Department's head of the Interagency Committee on Vietnam. Pauker recalls that, at their meeting, Sullivan had a list of twenty-five questions regarding the conflict to which his agency was interested in finding answers.[716] Most of the questions concerned psychological warfare problems and were of little interest to Pauker. Almost the last question on Sullivan's list, however, was "Who are the Viet Cong and what makes them tick?" This question had been raised by Secretary of Defense McNamara and offered an opportunity, Pauker thought, for some creative work. Also, the issue would allow RAND to employ techniques several of its analysts used briefly during the Korean War to illuminate enemy weaknesses.

In particular, Pauker had in mind the use of prisoner-of-war (POW) interrogations to explore Viet Cong military structures and morale. In Korea, these techniques had been used by RAND social scientists to explore, on a limited scale, the social and military structure of enemy forces

and the psychological and physical effects of various U.S. air weapons on those troops. For example, in 1951 Alexander George and Herbert Goldhamer had explored the relative effectiveness of air and artillery attacks on enemy troops using the interrogations of fifty-five Communist Chinese and eighty-eight North Korean POWs.[717] George and Goldhamer constructed specialized questionnaires for this research and concluded that air weapons had greater intimidating character than artillery and infantry weapons. In particular, the RAND team found that "Napalm [was] considered the most effective weapon in all cases."[718] In light of their experience in Korea, however, George and Goldhamer cautioned that, "Most of the findings of this report should be looked upon as tentative. The POW statements recorded were often ambiguous or so general in character that analysis on some points was very difficult."[719]

Despite these shortcomings, Pauker moved to construct a research program using the Korean POW techniques to answer McNamara's question about the Viet Cong. His first task was to find funding for the work, and, since the Secretary of Defense had raised the question, Pauker went first to Henry Rowen in the OSD. Rowen was eager to fund the project but could not provide RAND with access to the prisoners necessary for the research. For this, Pauker turned to an acquaintance at the Central Intelligence Agency (CIA), William Colby. Then the Assistant Director for Asia/Pacific Operations, Colby informed Pauker that he had just the place for RAND's work. It so happened that Colby was responsible for overseeing a detention center near Saigon that held several hundred Viet Cong prisoners, defectors and suspects, and he offered Pauker access to the camp. With the resources in place, Pauker recruited RAND consultants Joseph J. Zasloff and John C. Donnell to conduct the research project.

Following George's and Goldhamer's example, Zasloff and Donnell based their research on first-person interviews with Colby's Viet Cong POWs. First, they recruited native Vietnamese scholars, mainly from the University of Saigon, to assist with the interview process, and between May and December 1964 this team conducted 172 interviews with a diverse group of Viet Cong POWs, defectors, and suspects. The RAND team translated the interrogations into either English or French, and, by early 1965, Zasloff and Donnell with some assistance from Guy Pauker had completed a paper summarizing their surprising results.[720] First, Zasloff and Donnell found that the Viet Cong movement embraced a mass of Vietnamese, "ranging from the casual peasant supporter who occasionally buys supplies for the VC on a trip to the local market, to the most deeply dedicated cadre in the main forces."[721]

Among the Viet Cong forces, the RAND study identified two principal groups distinguished largely by age. The first group was an older generation who had fought as Viet Minh against the French and were, by 1964, thirty years of age or older. Many of these individuals had regrouped in North Vietnam before infiltrating back into the South, but some had remained underground in the South for nearly a decade. According to Zasloff and Donnell, "These men form the backbone of the revolutionary effort in the South and they see it as a continuation of the war of independence against the French."[722] The younger generation, mainly those recruited after 1958, were found to have joined the Viet Cong for a variety of reasons including social protest, lack of opportunities on the GVN side, distaste for being drafted by ARVN, adventurousness, admiration for older Viet Minh family members, and "a desire to protect Vietnam from the 'American imperialists and their lackey, the GVN.'" Even for Zasloff and Donnell's Vietnamese assistants, this came as a shocking revelation. They had expected to find the Viet Cong populated by apathetic peasants who had been kidnapped and indoctrinated by communist agitators. Instead, the RAND staff found the Viet Cong to be zealous, committed, and sincere in their struggle. The most committed of the prisoners interrogated stressed the voluntarism of the Viet Cong movement and pointed out that, "you cannot make a good revolutionary fighter out of a person dragooned into service."[723]

Crucially, Zasloff and Donnell found that nationalism was far more important than communist ideology as a motivating force among the Viet Cong. They reported,

> In their struggle to establish independence, the VC . . . look upon the Diem regime and it successors as puppets of American imperialism. They certainly do not regard the present war as a struggle between North and South Vietnam, or between Communists and anti-Communists, but as a struggle between the legitimate leaders of an independent Vietnam and usurpers protected by a foreign power.[724]

Indeed, the second generation Viet Cong were found to be almost entirely lacking in comprehension of communist ideology and unable to discuss communism in any detail.

The RAND analysts also captured tales of great poignancy and heroic effort in their interrogations. Many of the regroupees who had journeyed to the North in 1954 to await the 1956 elections and unification of their country were bitterly angry about the cancellation of the plebiscite, which they unequivocally blamed on the United States and Diem. Instead of a temporary separation from their wives, children, and families, these men had now been separated for a decade with little hope of reconciliation in the foreseeable future. The regroupees described in detail the arduous three and one-half month trek across the mountains and jungles of southern Laos and central Vietnam to reach their homeland and renew the struggle. Zasloff and Donnell commented, "we drew the strong impression that these Southerners, who had lived in the North and walked back down over a good part of Vietnamese territory, had developed a sense of the oneness of their nation."[725]

That is not to say, however, that class-identity played no role in Viet Cong motivations. The RAND analysts found that the young men they interviewed recognized that they would have to serve either with the Viet Cong or with ARVN. For these men, "the Diem side represented the rich, the landowners, the city people. The [National Liberation] Front, they believed, was for the poor."[726] Even the Viet Cong officers tended to come from the lowest ranks of society, in sharp contrast with the South Vietnamese government's officer corps, which was made up almost exclusively from the elite, educated class. Zasloff and Donnell found the Viet Cong to be more interested in social justice than class-based retribution, and they commented:

> Our findings give the lie to the old cliché, still frequently intoned by Saigon intellectuals, that all the Southern peasant wants is his [little plot of ground and to be left alone]. We found in our sample many poor peasants with no formal schooling who were eloquent in the expression of their aspirations for education , economic opportunity, equality and justice for themselves and, especially, for their children. They were equally eloquent in expressing their indignation at the injustices they knew.[727]

Zasloff and Donnell also brought to light widespread atrocities inflicted by South Vietnamese officials and soldiers on Viet Cong prisoners and suspects. On December 8, 1964, Guy Pauker sent a letter to John McNaughton, Assistant Secretary of Defense-ISA, conveying observations reported by Zasloff and Donnell during their ongoing work in Vietnam. Specifically, the RAND analysts reported, "American eye-witness accounts . . . concerning the killing of VC prisoners by ARVN personnel, not in the heat of battle or its immediate aftermath, but after they had been transported to the rear."[728] Furthermore, they found that while the VC practiced, "a shrewd policy of benevolence toward captured ARVN and paramilitary personnel," South Vietnamese officials pursued tactics in which, "The initial beating of surrendered enemy personnel is followed

by lengthy and repeated torture n the course of interrogations."[729] Frequently, these interview sessions terminated with the summary execution of the captured subject.

Overall, Zasloff and Donnell constructed a deeply textured and complex analysis of the Viet Cong, depicting them not as duped jungle guerrillas but as a cohesive, committed organization motivated largely by a powerful nationalism. As such, their report called into question some of the basic assumptions held by American policymakers concerning the Vietnamese conflict and its place in the global Cold War confrontation.

Zasloff and Donnell's research and findings were vetted, during early 1965, among the top American leadership in South Vietnam, including two briefings to theater commander General William C. Westmoreland and his staff, the RAND staff in Santa Monica, as well as throughout the Pentagon. The pivotal briefing took place in Washington before ASD-ISA John McNaughton, his Deputy Henry Rowen, Southeast Asia group head Leonard Unger, and Daniel Ellsberg. The ISA audience was particularly impressed by the import of the RAND findings. According to Rowen,

> We heard this story about the Viet Cong [from Zasloff and Donnell], and there was a silence in the room, after about a forty-five minute talk. McNaughton and I looked at each other and I said, "John, I think we're are signed up with the wrong side—the side that's going to lose this war." And he agreed. What we had heard was such a description, and from what we can tell a very accurate description, of such a strong institution, the Viet Cong, that we were in deep trouble.[730]

According to Zasloff and Pauker, however, McNaughton never delivered the study's findings to Secretary McNamara. By the time these briefings had taken place, the corrupt and chaotic South Vietnamese regime was in extremis, and President Lyndon Johnson and Secretary of Defense Robert McNamara had decided that large-scale U.S. intervention would be implemented to prevent its collapse.[731] With vivid memories of American reactions to Communist success in China in 1949, Johnson would not countenance the "loss" of South Vietnam—a theme that haunted successive U.S. presidents from Eisenhower through Nixon. Having embarked on this commitment, McNamara was not in the mood to receive analyses that questioned the viability of his strategy, and McNaughton withheld the report from his boss's attention. As such, despite their startling content, the Zasloff-Donnell briefings did not reach the pinnacle of American policy-making and had no impact upon the disastrous U.S. decision to escalate. After March 1965, the desire in both the White House and the Pentagon to understand the complex social and political forces at work in Vietnam faded and was replaced by the overarching imperative to win. As Landau remarks, the utility of analyses thus came to be judged solely on their contribution to the goal of victory, and the Zasloff-Donnell study scored poorly on this scale.[732]

Even within RAND, there was considerable negative reaction to Zasloff's and Donnell's findings. Despite evidence to the contrary, the preponderance of RAND analysts continued to view the Southeast Asian conflict through the lens of monolithic communism and global containment. The Zwick committee's report, written two months after Zasloff and Donnell completed their study, clearly restated this dominant perspective:

> Southeast Asia is not of great importance to us for its intrinsic value as economic or strategic real estate; rather, it is important because of the global implications of what happens there. A series of Communist victories in Southeast Asia could, for example, endanger the existence of India as an independent nation, stimulate insurrectionary activity in Africa and Latin America, or disrupt Japanese-American relations. Thus, although we are presently engaged

> most actively in countering moves directed by the Vietnamese Communists (in South Vietnam, Laos, and Thailand), our ultimate concern is focused on Communist China, her will, and her increasing capability to challenge the U.S. throughout the world.[733]

In fact, most of the Zwick committee's analysis was couched in terms of communist, especially Chinese communist, ambitions in and beyond Vietnam.

In refuting the RAND study, Zwick and his committee members had a powerful ally in Frank Collbohm. During Collbohm's visit to Vietnam a few months later, his inspection of the Viet Cong arms cache reinforced the global contours of the Vietnam conflict. Whereas individual Viet Cong might be fighting for local reasons, the Soviet, Czech, and East German manufacturing stamps on their weaponry proved that their struggle was under the sponsorship, and thus the direction, of the Communist bloc. The fact that foot soldiers could not recite Marxist scripture did not prove, for Collbohm, that they were not tools of a far larger communist program. Collbohm expressed the orthodox Cold War perspective prevailing at RAND when he lectured a group of Vietnamese university students during his trip. When asked by the students what U.S. objectives were, Collbohm responded, "Actually, we don't care whether you're free. It's really of no major concern of ours. . . . Right now, and here, we are resisting Red China, and it is for the same reason. If Red China takes over Vietnam, Laos, Thailand, Burma, India, Indonesia, maybe even Australia, don't you think we'd be worried about that? That's why we're here."[734]

The inherent contradiction between RAND's global containment orthodoxy and the emerging counter-view put forth by Zasloff's and Donnell's research erupted into heated dispute within RAND just as Zasloff and Donnell were reporting their findings. The catalyst for this reaction was Leon Gouré—a strident anti-communist political scientist who became involved in the Viet Cong Motivation and Morale program in 1964. Gouré was a Soviet specialist whose parents had fled Stalin and the Soviet Union when he was a young boy. Educated in France and hired by RAND in 1951, Gouré was "the prototypical European intellectual, one whose work was underlain by an abiding skepticism and hatred for the ideological forces which tore the world asunder in the 1930s."[735] His intense anti-Soviet ideology is illustrated in his 1962 book, Civil Defense in the Soviet Union, which argued not only that the Soviet Union was in the process of constructing a vast civil defense system, but that this system was likely the harbinger of a surprise nuclear assault by the Soviets on the United States.[736]

During a trip to Vietnam in 1964, Gouré encountered Zasloff and Donnell and became familiar with their interview program. He also became fascinated with a rather obscure segment of the project that addressed the effects of U.S. and South Vietnamese bombing and artillery attacks on Vietnamese peasants. Zasloff and Donnell directed relatively little attention to this subject and concluded, rather obviously (so they thought), "when a village suffers artillery or aerial bombardment, it becomes a locus of hatred against the ARVN and the Americans."[737] Gouré, however, arrived at a diametrically different interpretation of the interview data—one that for him provided unequivocal support for the effectiveness of aerial bombing. In a research memorandum published in December 1964, Gouré argued that data from the POW interrogations demonstrated the corrosive effects of U.S. bombing on Viet Cong morale.[738] Moreover, he found that South Vietnamese peasants subjected to U.S. bombing tended to blame the *Viet Cong* for their plight because the guerrillas' presence drew the attacks and, therefore, indirectly caused the casualties. Gouré's essay was, in fact, an extended proposal for further exploitation of Viet Cong interrogations to demonstrate the effectiveness of U.S. air operations. According to Gustave Shubert, who took over direction of RAND's Vietnam research from Jack Ellis in late 1965, Gouré's analyses came to be known among detractors as the "How I Learned to Love to be Bombed" reports, and they immediately drew intense criticism within RAND.

For example, just three weeks after Gouré had completed his first report, William F. Dorrill wrote an extended and acerbic memorandum criticizing Gouré's methods and conclusions. Dorrill had spent considerable time in Vietnam, authoring in 1964 a research memorandum entitled, "South Vietnam's Problems and Prospects: A General Assessment," and was thus not uneducated in Vietnamese conditions.[739] After systematically dismantling Gouré's methods and pointing out the perversity of his logic, Dorrill concluded,

> Because of its evasion of fundamental issues, its one-sided interpretations, and its conclusions which are unsupported either by fact or argument, one cannot help wondering whether [Gouré's report] is advanced as a serious research proposal or an offer to build a case for certain highly controversial policy recommendations.[740]

Significantly, whereas the Zasloff and Donnell study had been performed for ISA, Gouré's report was written under the sponsorship of the Air Force's Project RAND. Unlike much of RAND's previous work on counterinsurgency and air operations in Vietnam, Gouré's thinly veiled case for intensified air operations was well received by the men in blue, a response that is hardly surprising.

Despite the intense criticism leveled at Gouré's work, however, his program not only survived, but it flourished. Between August 1964 and December 1968, RAND conducted approximately 2400 interviews, with the transcripts of those interrogations totaling over 62,000 pages.[741] This was largely due to the support of Frank Collbohm, who became a staunch supporter of Gouré's research. Having read Gouré's research proposal with relish, Collbohm in early 1965 informed Guy Pauker that the motivation and morale program was being reoriented towards air power effectiveness and that Gouré would be assuming control. During Collbohm's trip to Vietnam in April 1965, the influence of Gouré's work was already apparent, as Collbohm attested in his trip report,

> A number of people told me the RAND interviews are developing more intelligence on more different subjects than the entire intelligence community is delivering. Whenever they are in trouble, they call Leon. Last Saturday they had a request from Washington for something on the effect of air strikes on the VC, and the only place that information existed was in the RAND building on Rue Pasteur. They called Leon. . . . I think that RAND's stock in the theater is very high. They really like us. Leon is doing a fantastically good job there.[742]

In fact, Gouré's reports did have a powerful impact on the Pentagon throughout 1965 and 1966 despite the severe deficiencies in his research methods and the criticism his work was receiving at RAND. Whereas Zasloff's and Donnell's negative interpretation of American prospects in Vietnam was withheld from McNamara, Gouré had almost unlimited access and briefed the Secretary regularly. Pauker recalls, "When Gouré would return from Vietnam to Santa Monica, he would stay long enough to change shirts, then fly off to Washington to brief McNamara. McNamara was lapping up Gouré's work like good Scotch."[743] Much of Gouré's work consisted of oral presentations to high-level military and political authorities in Saigon and Washington, which presented an optimistic depiction of the actual and potential effects of U.S. air operations on the Viet Cong and the enemy's vulnerabilities to those operations. According to Goldberg, "audiences, particularly in the Air Force and some in OSD apparently found confirmation for preferred views and attitudes already held."[744] In August 1966, for example, ASD-ISA John T. McNaughton, on behalf of Secretary of Defense McNamara, asked for monthly reports from Gouré showing changes in trends concerning the Viet Cong.

The limited written record of Gouré's work demonstrates the consistently positive message he was delivering to Washington audiences. In May 1966, for example, Gouré sent a teletype message to the chief of ISA's Policy Planning Staff for transmittal to Secretary McNamara which included the following "impressions":

> The interviews do not indicate that the increased deployment of U.S. combat forces in Vietnam has intensified anti-American or anti-foreigner sentiments among the villagers or that it has in a significant way reinforced the effectiveness of VC anti-imperialist propaganda and appeals.
>
> The great majority of interviewed VC captives and defectors mention continuing and growing decline in voluntary villager support of the VC. Several sources mentioned that in some VC areas popular support of the VC had dropped from 70 percent to 30 percent of the population.
>
> The interviews indicate that the civilian cadres in VC villages face increasing problems in controlling the villagers.[745]

Furthermore, Gouré seems to have withheld from dissemination adverse information turned up in the interviews, as evidenced by the treatment of accounts by Vietnamese villagers of atrocities committed by South Korean troops. In December 1966, Gouré sent a memorandum to RAND Social Science Department Head Joseph Goldsen including fourteen pages of interview excerpts describing Korean atrocities.[746] These accounts included the murders of nearly one hundred occupants of a particular hamlet, including thirty-six children; fifty villagers at another location; and the murder of fifty-three in the hamlet of Tho Long. As Gouré explained, "we have avoided discussing [this material] in previously published reports." But he had mentioned the information to ARPA chief scientist Charles Herzfeld in Saigon, and Herzfeld had urged Gouré to report the atrocities to General Westmoreland. In conveying this information to Westmoreland, however, Gouré took care to point out "the limitations of the sample and that the information was unevaluated and unverified."—qualifications he rarely made regarding his bombing analyses.[747]

With support from Collbohm, as well as from Social Science Department Head Joseph Goldsen and RAND's senior social scientist, Hans Speier, Gouré prosecuted his research with impunity. Even Shubert, who was in nominal control of RAND's Vietnam research program, could do little to rein in Gouré's work. Following the completion of the Zwick committee report in 1965 on Vietnam research opportunities, Frank Collbohm had appointed Gustave H. Shubert to direct RAND's overall counterinsurgency and Vietnam research efforts. Almost immediately, two of Gouré's assistants in Vietnam, Anthony Russo and Douglas Scott, informed Shubert that the motivation and morale work was a "total jumbled mess" and that the conclusions were "false and misleading." Shubert went to Vietnam to inspect Gouré's methods and discovered "that there was no research methodology at all."[748] As Shubert recalls,

> [Gouré's] research methodology was totally unacceptable. . . . It was picking, maybe at random hours or random days of the week, excerpts from the interviews that supported a point of view—and that point of view was that bombing, and to some extent shelling, resulted in increased hatred for the Viet Cong and not for the Americans, and therefore the more, the better.[749]

Despite his conviction that Gouré's methods and conclusions were faulty, Shubert could do little to overcome Collbohm's and Goldsen's support of the program. Throughout 1966, Shubert tried to impose review requirements on Gouré, but, as Shubert recalls, Gouré "would participate in the reviews, and then he would go out and give any damn briefing he felt like, which had no resemblance to the briefing he gave at RAND."[750]

To the dismay of RAND researchers, the questionable nature of Gouré's research methods came to the attention of Senator J. William Fulbright, the chairman of the Senate Committee on Foreign Relations, in May 1966. Fulbright wrote to Secretary of Defense McNamara,

> I have received reports of recent surveys conducted by The RAND Corporation and others concerning the attitudes of Viet Cong defectors and prisoners. These reports suggest that those in charge of the project may have manipulated the results in such a way as to affect the results.[751]

Fulbright demanded that McNamara conduct an investigation of the RAND study methods and report back to the Foreign Relations Committee. Accordingly, McNamara assigned a high-level Air Force investigative team to examine Gouré's operations, which, not surprisingly, found that Gouré's methods were sound and that his findings had been quite useful to the Air Force.[752] Reflecting on the Air Force investigators' report, Shubert viewed it to be "a typical bureaucratic put-off."[753] Given Collbohm's support of Gouré and the enthusiasm with which his message was being received in Washington, Shubert was powerless to choke off the motivation and morale program until Frank Collbohm was left RAND's presidency in 1966.

As Gouré's work proceeded, however, it acted as a catalyst in the fragmentation of RAND's professional staff into pro-war and anti-war factions—a polarization that probably pre-dated the more widespread division that afflicted American society in general by 1968. Many staff members, like Shubert, were horrified both by Gouré's methods and his conclusions. Critics argued that Gouré's findings could be sustained only by an extremely selective use of the interview data, and they denounced him as an opportunist who was willing to sacrifice intellectual honesty to support the interests of the Air Force. Detractors further warned that the analytical negligence of Gouré's research threatened to impugn the scientific validity of systems analysis and thus risked RAND's reputation—as the Fulbright incident demonstrated. Furthermore, some felt that by validating the use of overwhelming air power, Gouré's work was adding needless death and injury to that U.S. forces were already inflicting on the Vietnamese population. Gouré's methodology raised particularly sharp criticism among RAND's economists whose commitment to quantitative techniques was a hallmark of the "RAND style" of research. Finally, critics suspected management complicity in these sordid affairs and perceived that a heavy-handed attempt to encourage research conclusions more favorable to the Air Force was afoot. Once again, the sensitive issue of RAND's intellectual independence came to the fore.

While Gouré's research methods were the immediate target of criticism within RAND, the motivation and morale studies also stimulated divisive arguments concerning the morality of U.S. actions in Vietnam. Despite Collbohm's removal of Zasloff and Donnell from the motivation and morale project, a handful of RAND researchers continued work on the social bases of the conflict, largely at their own initiative. Of particular note is the research of Konrad Kellen, who analyzed the Vietnam interviews and published research directly contradicting Gouré's findings.[754] Also, Anthony Russo used cost-effectiveness analysis to question the productivity of U.S. defoliation campaigns and to point out the catastrophic impact this chemical warfare was having on Vietnamese peasants. As noted above, the preponderance of RAND staff members believed in the veracity of the "domino theory"—that a failure by the United States to demonstrate its will to

resist communist aggression would lead to catastrophic consequences. This dominant opinion was reflected in the Zwick committee's report in February 1965, and it generated a sense among its proponents that the United States was justified in taking any actions that would thwart Communist aggressions. Thus, while they may have had reservations about Gouré's research methods, most supported even the most extreme measures by which U.S. objectives in Vietnam might be achieved.

Guy Pauker offers an enlightening illustration of the complex sentiments generated by the Vietnam conflict within RAND. During the late 1950s and early 1960s, Pauker was RAND's foremost expert on Southeast Asia and was one of the few American academics who had extensive knowledge of Vietnam. While a professor at Harvard, Pauker had traveled to Vietnam for the first time in 1955 on a Ford Foundation faculty fellowship and had returned there annually through the early 1960s. He was well acquainted with Vietnamese society and the conditions underlying the emerging conflict in South Vietnam. Further, his direction of Zasloff's and Donnell's initial motivation and morale project had deepened his understanding of the social complexities at work.

Still, Pauker was characteristic of RAND's Social Science Department in that he was a refugee of eastern Europe and a stanch anti-communist. Pauker had been born in Romania in 1916 and was at the University of Bucharest during Stalin's purges of 1936. When Soviet-backed Communists seized power in Romania after World War II, Pauker happened to be studying in the United States and escaped persecution. However, his wealthy father lost everything and fled to Paris after surrendering his last possessions—his watch and fountain pen—at the Romanian border. Pauker did not return to his native land but carried with him a lasting antipathy for all things Soviet. Thus, as Pauker came to understand the realities of Vietnam during the 1950s and 1960s, his perspective remained dominated by his abiding anti-communism. In February 1965, he published a RAND internal document entitled, "What Can be Done in South Vietnam? A Personal View," in which he argued that the situation in Vietnam represented a stern test of American ability to cope with the communist bloc's latest tool of expansion—revolutionary warfare.[755] Given the crucial nature of this test, he found that extreme measures were both called for and justified.

Since RAND research had indicated that U.S. policymakers had to "discard the fiction of dealing with a popular and legitimate government in South Vietnam," Pauker advised that the U.S. "land American combat troops in South Vietnam, not for the purpose of fighting the Viet Cong, but for the purpose of taking over control of the government in Saigon and in the provinces."[756] Once established, American forces could round up rebellious students and others, and arrest and deport them for the duration of the conflict to "one of the penal colonies off the coast of South Vietnam."[757] Furthermore, American control would require the elimination of Vietnamese political freedoms, especially the rights of free speech, press, and assembly. While such actions might appear distasteful, Pauker argued, if Vietnamese nationalism was not anti-communist—and Zasloff's and Donnell's analysis indicated it was not—then the U.S. had "no way of denying South Vietnam to the communist orbit except by full-fledged long-term military occupation against the sentiments of the population."[758]

In retrospect, Pauker was probably correct in his assessment that without direct U.S. military intervention, the GVN was doomed. However, his conviction that the U.S. would be justified in taking such extreme actions reflected the larger Cold War morality that permeated RAND. Throughout the 1950s, RAND's research community had flourished in the secure belief that its work was essential to the defense of freedom against an implacable and godless foe. At the outset of the Vietnam War, few at RAND hesitated to recommend the widespread use of defoliants, bacteriological agents, napalm, or even nuclear weapons as American interests demanded. During

Collbohm's 1965 trip to Vietnam, for example, RAND's president had an encounter with ARVN brutalization and torture of prisoners-of-war and defectors that was most revealing in this regard. On one occasion during his trip, Collbohm dined with General Thi, the commander of ARVN's I Corps, who, according to Collbohm's account, "tortures prisoners and then shoots them" in order to get "that last 20 percent of information." Collbohm talked at length with Thi about this tactic, attempting to convince the general that, "it was in his self-interest to change his way of operation, because he gets very few prisoners." Collbohm thus objected to Thi's brutal tactics not because of their immorality, but because, in the long run, the cost of Thi's tactics in terms of additional defectors exceeded the benefit of the additional information gained through torture.

As the Vietnam War continued, however, RAND's research efforts such as those by Kellen and Russo revealed the extent of human suffering caused by American military actions as well as the futility of many of those activities. Alliance with a corrupt regime and the brutalization of unarmed peasants severely eroded the sense of righteous purpose that had long characterized RAND, and a steadily growing fraction of the professional staff found the organization's work in Southeast Asia to be repugnant. In a powerful memorandum to Gouré and some of his colleagues, for example, Kellen raised, perhaps, the central moral questions:

> In connection with the continuing debate as to whether or not U.S./ARVN shelling and air bombardment of villages drives villagers into the arms of the V.C., I should like to ask the question: Why are people so eager to know? Do they feel, perhaps, that if they have a written guarantee that villagers will not join the V.C. when bombed and shelled, this gives them a hunting license? When it comes to killing people, or engaging in operations that make such killing likely, are "tactical" considerations the only criterion? No matter what the trade-off in the narrow confines of the "will they or won't they join the V.C. in case of bombardment" schema, can not a case be made that (a) the trade-off in the broader sense will be in our disfavor anyway in the case of large-scale killings, and (b) Americans are in danger of degrading their basic value structure if their calculations in this particular area should come to center merely or mainly around what we can "get away with?"[759]

Daniel Ellsberg's return to RAND in 1967 after a discouraging two-year tour of duty in Vietnam further energized the debate. As will be discussed in greater detail in Chapter Eleven, below, Ellsberg had experienced a remarkable conversion in Vietnam—shifting from an ardent Cold Warrior to a zealous opponent of U.S. intervention in Vietnam. He immediately applied his considerable energy and intellectual capabilities to arguing the case for American withdrawal with anyone at RAND who would listen.

At the same time, some of the analysts working on operational studies for the Air Force had become deeply disillusioned with the U.S. war effort. For example, in October 1967 the head of RAND's air interdiction study group, Edward Sharkey, published a thought-piece expressing the deep frustrations felt by RAND analysts working on Vietnam problems. Despite massive efforts, Sharkey argued, nothing the U.S. tried seemed to work, and no victory or solution was in sight. Furthermore, he admonished the Air Force for refusing to adopt tactics relevant to Vietnam conditions while feeding inaccurate performance reports to Washington authorities. He concluded his essay by ridiculing an analysis that recently had been conducted by the Air Force and reported to the Senate Armed Services Preparedness Investigating Subcommittee (the Stennis Committee) by U.S.A.F. Chief of Staff General John P. McConnell. The Air Force study informed Congress that bombing actions had saved the United States approximately $75 billion and the commitment of 800,000 additional troops by crippling the North Vietnamese economy and interdicting south-bound supplies. Sharkey wrote of this study,

> If the [Air Force analysis] is true, then it shows we have a truly Alice-in-Wonderland situation in SVN. It says that U.S. troops with all their better weapons, aircraft and helicopters, airlift, dollar budget . . . have to have a 6:1 numerical advantage over a bunch of guys in pajamas who have no artillery, no airpower, and a strictly primitive logistic system. Therefore, the only way the U.S. can win is by bombing the other guy's country to the point that he can't afford to send a few thousand more into the battle.[760]

In the end, it is most likely that the Vietnam War had a far greater effect on the RAND Corporation than RAND had on the Vietnam War. The war ended the Cold War consensus that had characterized RAND's professional staff throughout the post-World War II years and replaced that consensus with deep and bitter divisions—divisions that have not disappeared thirty years later. Gustave Shubert estimates that by the late 1960s, one-third of RAND's professional staff had turned against U.S. intervention in Vietnam while two-thirds remained in favor of American policies.[761] While the precise split between "hawks" and "doves" is impossible to calculate, the virulence of that split and its impact on RAND were readily apparent. In 1967, for example, as Peter Szanton was constructing RAND's social welfare research program in New York City, detailed in Chapter Ten below, he found that many of the Santa Monica staff members who volunteered or were "made available" for work in his office were anti-war refugees from RAND's headquarters.[762] Indeed, the intensity of feelings over RAND's Vietnam research program was best illustrated when heated discussion of the motivation and morale studies in one of RAND's Management Committee meetings erupted in a fistfight.[763] By 1966 the Vietnam War was rending American society, and, like a poison, it had seeped into RAND through the wounds opened by Leon Gouré's research. Eventually, this poison would lead to Daniel Ellsberg's 1971 spiriting out of RAND the top secret Vietnam study which known as the "Pentagon Papers" after they began to appear in the New York Times. Ellsberg's action—one of the greatest security violations in American history—nearly destroyed RAND and is still remembered bitterly by many RAND staff members as an act of treason.

Of perhaps the greatest importance to RAND's organizational development, the Vietnam War experience acted as a spur to the corporation's diversification from military into social welfare research and analysis. RAND's failure to affect U.S. policymaking in Vietnam and the bitter divisions engendered by the war added to the dissatisfaction with RAND's exclusive commitment to national security issues. Many of the advocates arguing for diversification were from the anti-war faction, and the early social welfare research projects were often staffed with disillusioned refugees from RAND's military programs. Furthermore, the Vietnam War provided important opportunities for RAND analysts to apply their methods to social welfare issues while remaining engaged in national security matters. This was especially true among RAND's economists such as Charles Wolf and Charles Zwick, who had gained experience applying systems analysis to social problems in the context of studying U.S. foreign aid programs in Southeast Asia. This work provided an intellectual basis for expanding RAND's problem set to include domestic policy issues in the United States. Finally, RAND's Vietnam research contributed to the continuing deterioriation of relations with the Air Force, forcing RAND's board of trustees to embrace social welfare research as an avenue for long-term growth and financial support.

Back to Table of Contents

Chapter Ten
RAND Decides to Diversify, 1962-1966

Despite the stabilization of relations with Air Force leadership and the apparent revitalizing of RAND's operational connections in the military, a growing sense of crisis gripped RAND's research staff during the early 1960s. Feelings gradually spread throughout RAND that the organization was losing vigor, that the most important national issues were migrating beyond RAND's purview, and that RAND's research efforts were becoming dangerously narrow and stale. In 1967, Daniel Ellsberg recalled that "unease within the organization—apathy, demoralization, frustration—over organizational factors . . . was becoming quite intense in 1963, my last year in Santa Monica. This led to an unprecedented amount of deliberate soul-searching."[764] Eventually, such soul-searching fed growing dissatisfaction with the corporation's exclusively military agenda and contributed to the sense that RAND was in need of fundamental change. While a handful of staff members had infrequently raised the issue of diversification beyond military research as early as 1960, by 1965 their voices formed a powerful chorus.

One early source of RAND's gnawing sense of crisis was staff members' concern over the dramatic decline of strategic policy studies as a component of RAND's research program.[765] During the 1950s, RAND had been, perhaps, the nation's most important site of strategic policy research. Between 1959 and 1963, however, RAND lost Albert Wohlstetter, William Kaufmann, Henry Rowen, Alain Enthoven, Daniel Ellsberg, and Herman Kahn. Also, Fred Hoffman departed in 1965, and Bernard Brodie had isolated himself from the RAND community by the early 1960s and formally resigned in 1966. Many of these men had assisted Wohlstetter with his sixty-nine page memorandum in 1960 that expressed their frustrations and their conviction that RAND was approaching a crisis.[766] In part, their departures reflected Frank Collbohm's disapproval of their strategic policy research and his efforts to control it.[767] Indeed, an organizational restructuring of RAND in 1960 was perceived by many as an effort by Collbohm to rein in the scientific analysts and choke off their influence.

At a more fundamental level, however, the "interesting" problems in defense policy were migrating away from RAND and taking with them the corporation's top talent.[768] During much of the 1950s, the Air Force had had a virtual monopoly on strategic defense responsibilities, and RAND's systems analysts found themselves in excellent position relative to both the information needed to conduct strategic analyses and the leading strategic policy-makers.[769] At that time, access to the dialogue within the Office of the Secretary of Defense was not required to conduct meaningful and influential studies of broadly defined national security problems. As McNamara and his staff centralized authority in the Office of the Secretary of Defense, however, analysts at RAND were gradually isolated from the data they needed to conduct informed research. The corporation's research contracts with the OSD mitigated this alienation, but these contracts tended to be for narrowly defined task-specific research. As such, RAND analysts were given access only to carefully circumscribed relevant data.[770]

Also, during the late 1950s and early 1960s, the focus of defense policy shifted from superpower thermonuclear confrontation to more abstruse issues of limited war, third area conflicts, and counterinsurgency—problems that involved the application of integrated forces rather than simple air power.[771] These new issues were also much less amenable to analysis using the rational, mathematically-oriented economic and game theoretic methods that had flourished at RAND. Alain Enthoven noted, for example, "the problem of insurgency is a political problem. . . . [T]he element of numbers and quantities and mathematical relationships, and so forth, is much greater in the strategic nuclear than in the counterinsurgency thing."[772] Thus,

despite the close connections between analysts in Santa Monica and the RAND expatriates in the OSD, especially between Enthoven and Henry Rowen and their mentor Albert Wohlstetter, the shift of defense policy concerns toward limited war and counterinsurgency reduced RAND's ability to analyze and influence policy-making. As Albert Wohlstetter later commented, "More and more of the decisions were things that were outside the powers of the [Air Force]." This meant that one had to leave RAND "so that you could do things with the people who had the power to exercise on the decisions you wanted to make."[773]

By 1965, the decline of strategic studies at RAND had clearly reached a crisis, as is indicated in the minutes of the corporation's Research Council. An anonymously written document attached to that group's meeting record for January 1965 argued that strategic studies could not long endure at RAND given their current state. The number of researchers devoting their full attention to strategic problems had sharply declined, and no consequential strategic policy projects were underway at RAND. The author lamented, "For an organization whose reputation and influence rest, in large measure, on contributions to strategic analysis, the disproportionate allocation of personnel and resources to non-strategic studies . . . represents an intellectual retreat, a retreat which RAND can ill afford."[774]

In addition to the eclipse of RAND's strategic studies, staff members, by 1965, were expressing concerns that RAND had lost organizational vigor. RAND's early days had been marked by a youthful energy and sense of purpose, as was noted by staff member James Digby.[775] Digby, who joined RAND in 1949 and worked there until 1986, reflected that in 1950,

> the average age of [RAND researchers] was just under 30; most had been in the military or in support of a war effort for which there was almost universal backing. And it was a war effort in which many engineers, physicists, and mathematicians felt that their skills had made a major contribution not only to equipment design but to operational decisions.[776]

By 1960, this crusading attitude had largely evaporated. On one hand, there was a sense that in 1946 RAND had represented a new concept and had filled a unique and profoundly important national need. By 1960, however, the proliferation of nonprofit organizations, many built on the RAND model, made the corporation seem, if not commonplace, certainly less singular. Researchers even began to speak of the "burden" of research in RAND's cloistered, self-contained environment. Corporate staff member Brownlee Haydon asked, "Do we envy the freedom of the academic to be not only free but ill-informed and innocently but loudly wrong? Or do we just complain that life in the inner sanctum is hard, endlessly challenging, nearly anonymous . . . and demoralizing?"[777] Finally, staff members also began to discern the disappearance from RAND of "mavericks"—researchers such as Herman Kahn and Edward Paxson whose unorthodox ideas and methods acted as intellectual catalysts at RAND. In 1965, Robert Specht wryly observed that RAND was in danger of becoming a "non-prophet" organization.[778]

In place of RAND's former exuberance, there seemed to be an advancing organizational inertia—symptomatic of a maturing organization. This inertia had been one of Charles E. Lindblom's most heavily stressed observations in his 1959 series of essays on RAND's changing nature.[779] Lindblom and others believed the roots of RAND's organizational inertia lay in three areas: RAND's increasing size, the fragmentation of its research staff into relatively autonomous departments (the "Balkanization" of RAND), and the maturation of RAND's methodological developments, especially systems analysis. In terms of RAND's size, staff members saw both the expansion of RAND as a whole and the growth of the corporation's non-research staff as contributing factors. On one hand, RAND as an organization had grown considerably throughout the 1950s, a process that had made impossible the informal and unstructured environment

characteristic of RAND's early years. On the other hand, staff members viewed with considerable skepticism the expansion of the corporation's support staff relative to its research contingent. A 1963 report to RAND's board of trustees noted that between 1951 and 1963 the proportion of RAND's staff consisting of researchers had fallen from fifty-one to thirty-nine percent while that of support staff had increased from forty-nine to sixty-one percent.[780]

The considerable authority vested in RAND's department heads by the 1960 reorganization was seen by proponents of interdisciplinary analysis as causing a fragmentation of RAND's research program. This was a matter of increasing frustration among individuals who saw interdisciplinary policy analysis as RAND's most distinctive capability. In 1963, for example, a group of twenty-four RAND staff members engaged in a series of "grass roots" discussions concerning RAND as an effective research organization.[781] They lamented RAND's fragmentation:

> RAND's most unique contribution, and its greatest strength, lie in its success for handling work outside of existing specialties. To continue to accomplish such ends, however, requires maximum cooperation of RAND personnel within and between the various subdivisions of RAND. With the passage of time we see departments tending to become institutionalized, self-contained entities rather than administrative conveniences. Some even show the desires of flourishing in splendid isolation. Our concern is that such a trend can act in a manner detrimental to the successful accomplishment of interdepartmental projects and goals.[782]

John Williams, a member of RAND's Research Council, was even more strident in his statement of this problem. He argued,

> Why we expect interdisciplinary marriages to occur frequently in this Balkanized facility divided into dictatorships and closed communes is the real mystery. The people don't even know each other. . . . The likelihood of interdepartmental cold wars between (say) engineers and physicists, or social scientists and mathematicians, would be reduced if the personal contacts were more frequent, and if the freedom to contract marriage were more general.[783]

In an effort to address this deficiency, president Collbohm created two "Program Manager" positions that were designed to facilitate the coordination of two of RAND's larger interdisciplinary projects. In September 1963, he appointed Robert Specht and James Digby to be the Program Managers, respectively, for RAND's research projects for the Atomic Energy Commission's Division of Biology and Medicine and the Assistant Secretary of Defense for International Security Affairs. Specht's and Digby's responsibilities were to "insure that RAND's competence is brought to bear on important issues facing these clients and that effective communications, concerning both research in progress and the results of completed studies, are maintained with each of these clients."[784] However, Collbohm failed to grant the program managers critical input to personnel promotion and compensation decisions, allowing these functions to remain the sole responsibility of the department heads. As such, these efforts to bolster interdisciplinary efforts were, for the most part, unsuccessful. As the Research Council observed in 1965,

> it is clear that [RAND's research projects] have become extremely fractionated. There is almost no exchange of information between people working on different, but related problems, nor is there any formal mechanism to insure an exchange of information.

> Furthermore, department members are never informed of RAND-wide trends which have direct bearing on their work, nor does any formal mechanism exist to do so.[785]

The third source of organizational inertia was a perceived maturing of RAND's key methodologies, especially systems analysis. The "grass roots" group of staff members who met in 1963 to discuss RAND's declining effectiveness concluded that the organization had thrived originally by working at the frontier of methodological developments and using these new tools to attack complex problems.[786] With the passage of time, they argued, the frontier had moved on while RAND remained committed to the increasingly stale questions for which its expertise was suited. Unfortunately, many of those problems had diminished in significance or had evolved from the research into the developmental stage. David Novick, for example, wondered whether RAND had oversold systems analysis, "with the result that [by] the mid-1960's the idea has lost much of its novelty and today everyone is doing it."[787]

As this sense of organizational malaise spread throughout RAND, the corporation began to feel deeply the insidious effects of the Vietnam conflict discussed in the previous chapter.[788] Just as Vietnam began to cut grievously into the American social fabric, intense personal and ideological differences threatened to shatter the collegial environment within RAND by 1966. The corporation had become intimately associated with U.S. efforts in Southeast Asia through its contacts in the Office of the Secretary of Defense, in particular through its research contracts with ISA and ARPA. RAND's deepening involvement in Southeast Asia magnified feelings among many staff members that RAND should consider a drastic change of course.

Recomposition of RAND's Board of Trustees, 1961-65

As RAND's staff experienced this gathering malaise, the composition of RAND's board of trustees – the corporation's principal strategic body – underwent a transformation that illustrates the RAND's strategic migration away from the military services toward the civilian agencies of the federal government. The years 1961-1963 witnessed the most extensive turnover in trustee membership to that point in the corporation's history, with nine changes over that three year period.[789] Except for two men whose tenures began in 1960 and 1961, but were abbreviated by their deaths in 1963, all of the departing board members had been trustees since RAND's founding in 1948. The most significant change came with the death of board chairman H. Rowan Gaither, Jr. in 1961.

Gaither had played a crucial role in RAND's history and his passing represented a watershed in RAND's development. Gaither had been the assistant director of the Radiation Laboratory at MIT during World War II, where he had made Frank Collbohm's acquaintance. After the war, Gaither had returned to legal practice in San Francisco, where Collbohm sought his assistance in 1947 when Collbohm began working on options for separating Project RAND from Douglas Aircraft. Gaither was been instrumental in developing RAND's pioneering corporate structure and in arranging the corporation's initial financing – a $600,000 line of credit with Wells Fargo Bank and a $400,000 grant from the Ford Foundation – and served as the corporation's sole board chairman since its incorporation in 1948. Gaither's close ties with the Ford family and their foundation translated into Gaither's presidency of that key American institution during the 1950s and into close ties between RAND and the foundation.

Upon Gaither's death in 1961, the chairmanship of RAND's board was assumed by Frank Stanton, the president of the Columbia Broadcasting System and a man with close ties to Presidents Kennedy and Johnson. Stanton had served on Gaither's Security Resources Panel (the "Gaither Committee") during the late 1950s – the body which delivered to President Dwight

Eisenhower a report on American national security deficiencies which placed the term "missile gap" into the political lexicon. Stanton immediately undertook a reconstruction of RAND's board that reduced significantly its scholarly (especially scientific) content but enhanced significantly its connections to the civilian policy-making segments of the federal government's executive branch. During these years, the board lost men such as Lee DuBridge,[790] Philip Morse[791] and Julius A. Stratton[792] as Stanton put in their places trustees like Newton N. Minow,[793] former administrator of the Federal Communications Commission, T. Keith Glennan, former administrator of NASA, and Don K. Price,[794] the Dean of Harvard's Graduate School of Public Administration and a powerful voice in federal policy-making. Changes in RAND's board also brought about significantly increased corporate representation. By 1965, in addition to Stanton the board included a president or vice president from Owens-Corning Fiberglas, Hewlett-Packard Company, the New England Electric System, Monsanto, and two vice presidents from Standard Oil of New Jersey.[795]

As a result of this recomposition, RAND's board of trustees enjoyed increasing communication with the Secretary of Defense and top-level members of the Kennedy and Johnson administrations. While it is unlikely that anyone at RAND wished to end the corporation's Air Force relationship, the rapid alteration of the board's composition strongly indicates a decision by the trustees to shift RAND's center of sponsorship away from the military toward the civilian agencies of the defense establishment. RAND's board could now serve as a conduit for direct contact with the Secretary of Defense and his staff and thereby expand RAND's role in policy-making. In October 1963, for example, McNamara's special assistant, Adam Yarmolinsky, met separately with trustees Don K. Price and Edwin E. Huddleson, Jr.,[796] so that his, and presumably Secretary McNamara's "concerns with [RAND's] present situation, and its future" might be discussed at the corporation's upcoming board meetings.[797] Between 1959 and 1965 the configuration of RAND's sponsorship steadily shifted away from the Air Force toward other, primarily Department of Defense and NASA, sources.

During this six-year period, Air Force support declined from over ninety percent of RAND's total to about two-thirds. By 1965, work for the Department of Defense and NASA, neither of which had been RAND clients before 1958, represented one-fourth of the corporation's effort. Also, throughout this period, as Air Force support declined steadily relative to RAND's work for the DOD and NASA, it remained virtually constant in absolute terms. Funding from the Air Force had leveled off by 1959, and the preponderance of RAND's subsequent growth in research was derived from DOD and NASA business. By 1965, RAND's board of trustees saw clearly that the corporation's best opportunities for growth and influence lay outside the Air Force.

Social Welfare Research as a New Direction

In consonance with the rising tensions concerning the Vietnam conflict, more and more RAND staff members became disenchanted with the corporation's virtually exclusive commitment to military research. As early as 1960, Edward Barlow, RAND's Director of Projects, had left the corporation partially because he was fed up with RAND's "bloody-mindedness." Prior to his departure, Barlow and Gustave Shubert had met with Frank Collbohm to suggest that RAND diversify its research program to include non-military programs. According to Shubert, "Frank threw us out in the hall, saying this was a mission-dedicated organization and we weren't going to have any of that foofaraw."[798] Later, Barlow recalled this commitment to military research to be one of the reasons he left RAND in 1960:

> After a while I just got tired of working on war—and just the feeling that I'm always thinking about bombs and killing people. This gradually made me think that life's got to have something other than that and I just don't want to work on war anymore.[799]

In 1961, RAND's Research Council indicated that an important portion of the research staff might have similar feelings. In its review of the corporation's ongoing work for NASA, for example, the council observed that despite the fragmented and short-term nature of the work, "NASA means a lot to many people at RAND, since it is a source of non-military support."[800]

Reinforcing these desires for non-military research opportunities was the fact that, as RAND moved further into the 1960s, it found its military focus and reputation to be an increasing liability in the recruitment of young researchers. In a 1961 proposal that RAND pursue non-military research, Joseph Goldsen argued that such diversification would, "increase the chances of attracting high quality people who do not want to spend all their time all of the time on military problems."[801] Later, in 1967, RAND researcher Daniel Ellsberg wrote to incoming president Henry Rowen that the public perception of RAND as "a disciplined organization, with a corporate position on everything and with corporately-enforced homogeneity of opinion" had a deleterious effect on RAND's recruiting.[802] Unfortunately for RAND, this growing unattractiveness of military research among young intellectuals coincided with dramatic increases in the salaries being offered by universities—RAND's primary competitor in its recruiting.

In large measure, the commentaries concerning RAND's approaching organizational crisis and the criticisms of RAND's Vietnam research efforts represented gradually intensifying reproof of Frank Collbohm's administration. For example, the "grass roots" discussions of 1963 concluded that while at its inception RAND's function and goals had been well defined, this was no longer the case and a "lack of corporate guidance" was contributing to the problem.[803] In an implicit indictment of Collbohm's loyalty to the Air Force and his refusal to permit meaningful expansion of RAND's non-military research program, the writers of a lengthy memorandum on RAND's condition asked, rhetorically,

> Who worries whether the total program is geared to the nation's needs, to customers' needs, to RAND's needs? Whether the program gives adequate attention to new problems, new fields of knowledge, new methodologies or whether too much RAND research is repetitive or treading worn grooves?[804]

Comprehension of RAND's deepening crisis in the mid-1960s was not matched by agreement as to a path forward among RAND's leaders. The options seemed rather limited: continue to try to balance RAND's position between the Air Force and Office of the Secretary of Defense, a precarious proposition at best; abandon the Air Force and seek primary sponsorship at higher levels in the Department of Defense, a strategy that was anathema to most of RAND's senior researchers and managers; submit to Air Force demands and sacrifice independence for security. None looked appealing. Another option, however, began to gain currency among RAND's staff members—one that involved fundamental change of RAND's research program and its base of sponsorship. Specifically, a growing contingent argued that to survive, RAND would have to move beyond its virtually exclusive commitment to national security research and diversify into research on issues of domestic social welfare such as education, urban development, and public health.

These arguments had particular resonance among RAND's economists, many of whom had begun to apply systems analysis to social research projects during the late 1950s and early 1960s. Early efforts in this direction took place in 1958 when Joseph Kershaw and Roland McKean

performed a pair of relatively small systems analyses, under sponsorship from the Ford Foundation, of public education and the structure of public school salaries in the United States.[805] These studies set the stage for RAND's receipt of a much larger, $500,000 grant from Ford in 1960 for a three-year analysis of urban transportation systems.[806] In addition, RAND economists Richard Nelson and Merton Peck performed a study, beginning in 1963 and funded by the Ford Foundation, of the relationship between technological change and economic growth.[807]

A much larger portion of RAND's staff, however, gained exposure to social systems analysis during these years through the more lucrative support of the Department of Defense. By 1963, RAND was performing considerable research in "third area" socio-economic problems as a component of its military-funded projects—a circumstance driven by the broadening conceptualization of national security during the 1960s. As discussed above, the early 1960s witnessed the migration of primary national security concerns away from global nuclear warfare towards more complex and socially-contingent issues such as "third area" conflicts, counterinsurgency, limited warfare, and social revolution. Correspondingly, RAND's national security research methods gradually incorporated more sophisticated analyses of socio-economic issues as RAND's systems analysts began to apply the ideas of equilibrium analysis, mathematical modeling, game theory, and simulation.

By the mid-1960s the corporation was heavily involved in research that required extensive study of foreign social, political, and cultural structures. For example, RAND's program of research, undertaken jointly for the Agency for International Development (AID) and the Office of the Assistant Secretary of Defense for International Security Affairs in 1963, comprised "systematic analysis of key, interlocking aspects of the national society, including agricultural productivity, industrial and urban development, the political bureaucracy system, and the relation between economic performance and such problems as HUK [Indonesian guerrilla] violence and ordinary crime" in Southeast Asia, Latin America, and, later, the Philippines.[808] RAND's research was designed to develop more effective methods for planning and allocating U.S. aid to underdeveloped countries. It comprised case studies done in the field and a study of returns on investment in education, and analyses of the status and performance of developing countries. The prosecution of these studies seemed to demonstrate the usefulness of RAND's analytical techniques in tackling social problems in "third area" nations. Consequently, more and more RAND researchers argued that their techniques should be used to address social welfare problems on the home front.

Reinforcing these arguments, by mid-1964, were the potentially rich sources of support made available for social welfare research under President Lyndon Johnson's "Great Society" programs. Previously, funding opportunities for non-military social welfare research had been restricted to a few private foundations and the penurious social agencies of the federal and state governments. President Johnson's programs seemed to change that, however, as massive resources were now being committed to social concerns that were ripe for systems analysis. Furthermore, the dissemination of RAND's policy analysis and management methods from the Defense Department throughout the federal administrative structure, described in Chapter Six, below, opened extensive connections between RAND and federal agencies at the core of Johnson's programs. As these connections deepened and Johnson's programs began to unfold, many staff members at RAND recognized that the "Great Society" in Washington might contribute handsomely to social welfare in Santa Monica.

Congressional Pressure and the Further Deterioration of Air Force Relations

Another powerful force moving RAND towards diversification was the re-emergence of congressional and Air Force pressure of RAND by 1965. As was previously discussed, intense congressional interest in the DOD's use of nonprofit contractors had surfaced by early 1961 and stimulated both the enunciation of the Zuckert Directive in September of that year and the formation of the Bell Committee on government contracting practices.[809] While the Bell Report, issued on 30 April 1962, fulfilled the Congress's demand for a review of nonprofit contracting practices, it recommended only a few changes in the status quo beyond the improvement of the government's in-house research capabilities. For example, the report recommended that attention be paid to the "reasonableness" of nonprofit contractors' salaries and benefits, and that strict guidelines concerning conflicts-of-interest be developed and enforced by the government. Also, the Bell Report recommended the revitalization of the federal government's in-house technical and scientific capabilities so as to reduce reliance on nonprofit advisors.[810]

After the report's publication, the House Military Operations Subcommittee of the Committee on Government Operations (Holifield Subcommittee) initiated extensive hearings on the Bell Report that proved generally favorable to its conclusions and to the use of nonprofit contractors. The Holifield Subcommittee had been instrumental in the creation of Aerospace Corporation, and its members tended to take a rather permissive view of nonprofit contracting by the military. Between 21 June and 31 August 1962, the Holifield Subcommittee held thirty-seven sessions of hearings on the Bell Report which produced 2,157 transcript pages. The witnesses interviewed in the hearings included the participants in writing the Bell Report and representatives from numerous for-profit and non-profit research organizations. Although some testimony, primarily from industry representatives, advocated tighter controls on nonprofits, the preponderance of witnesses were favorably inclined toward the Bell Report and argued that it provided adequate grounds for oversight of the nonprofits.

The reinforcement of the status quo, however, was an unsatisfying solution for the influential critics of nonprofit contracting. Over the next few years, the issue remained one of considerable sensitivity, like a smoldering fire given the ongoing and bitter struggle between the civilian and military components of the defense establishment. Secretary McNamara's care in preventing a flare-up is illustrated in the comments of his special assistant, Adam Yarmolinsky, at a December 1963, meeting of the U.S. Chamber of Commerce. When asked to comment on the DOD's use of nonprofit contractors, Yarmolinsky "pointed out that Defense awarded contracts on the basis of evaluated adequacy of the institution to do the job, whether it was a non-profit or a profit-making institution. He indicated further that Defense was not encouraging the creation of new special non-profit institutions, but, on the other hand, was attempting to insure an adequate in-house capability to assist R&D management efficiency."[811]

In the fall of 1964, however, fuel sufficient to create an explosion was applied to the issue of nonprofit contracting when the Subcommittee for Special Investigations of the House Armed Services Committee (Hardy Subcommittee) commenced an investigation of Air Force-sponsored nonprofits, especially Aerospace Corporation.[812] This subcommittee had been organized in 1962 by the powerful chairman of the House Armed Services Committee, Carl Vinson, and placed under the leadership of Rep. Porter Hardy (D-Va.). The Hardy Subcommittee's nominal task was to investigate the organizational changes taking place in the Department of Defense, but its true purpose was rooted in the ongoing struggle for authority between Secretary of Defense Robert McNamara and the leaders of the military branches. Vinson was a strong supporter of the military and a close ally of top service leaders in their deepening struggle with McNamara and his civilian aides.

Taking the nonprofit advisory organizations as a particularly attractive target, the Hardy Subcommittee promised to probe rumors that "persons not responsive to Congress or the President were having great influence on the formulation of defense policy, and that duly appointed civilians and military leaders, including the Joint Chiefs, were being by-passed in favor of individuals and organizations whose qualifications were unknown and who were not publicly identified."[813] Indeed, the investigation and hearings proved extremely embarrassing to both Aerospace Corporation and the Air Force. The subcommittee's report, entitled "The Aerospace Corporation: A Study of Fiscal and Management Policy and Control" and made public on 23 August 1965, was a 62-page exposé of specific abuses by Aerospace, including the shipment, at Air Force expense, of Aerospace president Ivan Getting's yacht from New York to California via the Panama Canal.[814]

For the Air Force, the hearings seemed to demonstrate its consistently lax oversight of Aerospace Corporation—and by implication the other nonprofit research organizations. Of particular consternation for Air Force Secretary Zuckert must have been the Hardy Subcommittee's conclusion that this tendency was evidenced by the service's failure to enforce Zuckert's own rules concerning nonprofit contractors—the policy directive of 22 September 1961. Zuckert could, however, take a measure of satisfaction from the Hardy findings since they demanded far more rigorous controls of nonprofit contractors and explicitly rejected the adequacy of the Bell Report while simultaneously endorsing the policies laid out in the Zuckert Directive. Specifically, the Hardy Subcommittee concluded with the following statement:

> The subcommittee does not consider the Bell report fully responsive to uniform policy needs in this area [of the management of nonprofit organizations]. The Air Force, in addition to the Bell report, had a secretarial policy statement which, if enforced, might have prevented many of the abuses that occurred at Aerospace. . . . It is time to examine the role of nonprofits. There is a clear need for consistent national policy and clear evidence that such consistent policy is not now available. Congressional hearings would be a useful step in that direction.[815]

As the Hardy Subcommittee hearings placed nonprofit contracting under a microscope, the Department of Defense, in general, and the Air Force, in particular, were forced to step up their level of control over these organizations. In response to this mounting pressure, Harold Brown,[816] who was then serving as Director of Defense Research and Engineering but soon would become Secretary of the Air Force, announced that the Department of Defense had placed a "ceiling" on the funding of nonprofit corporations. On 25 February 1965 before the House Appropriations Committee and on 2 March 1965 before the Senate Armed Services and Appropriations Committees, he testified, "we are imposing firm annual funding ceilings on these organizations so that their management knows as new tasks are accepted others must be dropped."[817] Later in the year, the House Appropriations Committee recommended that the growth of nonprofit organizations be constrained, and as a means of limiting size, it approved an annual dollar ceiling on nonprofits contracts.

At the same time, Secretary Zuckert determined to enforce decisively his policy directive on RAND. RAND at that time was proceeding to diversify its base of national security sponsorship outside of the Air Force and to defy the Zuckert Directive in its Project RAND contract negotiations. Bolstered by the authority of Secretary McNamara's office and the as-yet-unimpeached Bell Report findings, RAND management continued to defend stubbornly against what they perceived to be Zuckert's depredations on RAND's independence. On 9 March 1965, however, Zuckert met with the contract officer for Project RAND and expressed his willingness

to terminate Project RAND unless his policy directive was enforced. Zuckert ordered that the normal schedule for contract negotiations with RAND be moved forward by two months so as to allow additional time for negotiations. Not surprisingly, when negotiations between the Air Force and RAND on the fiscal year 1966 contract began on 17 May 1965, an immediate impasse was reached. As the Air Force's Project RAND Office history of the events relates, this impasse stemmed from

> Secretary Zuckert's stated determination to implement fully the provisions of his 22 September 1961 Policy on relations with nonprofit corporations; and his expressed willingness to risk interruption, reduction, or termination of Project RAND to attain his policy objectives, and (b) Communication from the President of RAND to the Chief of AFRDQ's RAND office that RAND's Board of Trustees voted during their 9 April 1965 meeting to accept termination of relations with the Air Force rather than meet the terms of Mr. Zuckert's policy.[818]

Rather than back down, as had occurred in 1962, however, Zuckert ordered that "planning be undertaken to (a) develop an alternate source to RAND, and (b) cut Project RAND in half and arrange to task RAND directly."[819] As an unambiguous message, he also directed in May 1965 that the Air Force Chief of Staff create top-level systems analysis office to perform policy research in-house.

RAND's Search for a New Direction, 1965-66

In response to the building tensions within the RAND organization and the ominous portents of the Hardy Subcommittee investigations, RAND's board of trustees asked, during its November 1964 meetings that RAND's management prepare a written statement for the April 1965 board meetings concerning the ongoing evolution of the corporation's research program. It also instructed that an unusual "board symposium" be included in those meetings—an unstructured discussion between trustees and senior RAND staff members that would consider the future of RAND's research and organization.

To prepare for this meeting, RAND's Management Committee, chaired by president Collbohm, held a series of meetings in early February 1965 to consider the future course of RAND's research program.[820] Surviving meeting minutes indicate that the discussions at these meetings were lengthy and intense, that the principal issue under consideration was whether RAND should diversify into social welfare research or remain focused on national security problems, and that opinions differed sharply. While no consensus on this question emerged, news of the Management Committee's discussions touched off another remarkable flurry of introspective "Whither RAND?" memoranda during the last weeks of February and into March 1965. In all, at least twenty-two separate memoranda, mostly directed to the chairman of the Research Council, were written by a wide range of researchers between 10 February and 8 March 1965.[821] Of these twenty-two, nineteen supported some form of diversification into new research domains, especially non-military areas. Typically, the writers of these memoranda argued that RAND should maintain its attention to national security but make a planned, rational entry to research on issues of social welfare. One researcher, for example, commented,

> [W]hile keeping its eye on its main task, RAND should continue to foster and encourage investigations in new directions that are appealing to the staff and that will attract the best

> students and scholars to RAND . . . , for example, studies in urban development, the life sciences, weather control, or artificial intelligence.[822]

While support for RAND's diversification seemed strongest among economists and engineers —those staff members most closely associated with systems analysis—the preponderance of RAND's senior managers and department heads seemed opposed to radical reorientation of the corporation. Even the Research Council, which had been a source of support for RAND's systems analysis efforts, was unwilling to support a significant dilution of RAND's commitment to national security research. Willis Ware, the head of RAND's Computer Sciences Department, commented, "given our present management attitudes and practices, I'd guess that not very much will change."[823] In the short run, he was right. On 2 March, the Research Council reported a consensus among its membership:

> Although there have been many discussions on whether or not RAND should diversify into areas of research that involve internal security problems of the U.S. or U.S. public welfare problems, it is the view of the Council that the increasing external global security problems of the U.S. are so great that our efforts should continue to be directed mainly at national security problems.[824]

At the April 1965 board of trustees meetings, RAND's management presented to the trustees a plan that appeared to be a compromise between maintaining RAND's exclusive dedication to national security and diversification into social research. In a report entitled "New Areas of Research," management proposed that RAND expand considerably its research on the "social, economic, and military problems in underdeveloped countries"—in essence, an expansion of the corporation's existing work for ARPA, ISA, and AID in "third area" national security issues and intelligence.[825] Such a strategy, they argued, would take advantage of the broadening conception of national security in the Department of Defense, retain RAND's exclusive concentration on national security problems, and still allow the corporation's research program to include a greater amount of non-military work. They emphasized that this would be a relatively painless, evolutionary step that would be "a natural outgrowth of our prior work [yet] represent a broadening and deepening of our program [and] the opening of new fields of work."[826]

The compromise strategy presented by Frank Collbohm and his staff to the board quickly became untenable. The imposition of a budget ceiling on RAND's work for the Department of Defense prohibited the significant expansion of work for ARPA, ISA, or other national security agencies. At the same time, the Air Force's hard line towards fiscal 1966 Project RAND contract negotiations presented a distinct threat to even the short-term viability of the corporation. Despite the broadening of RAND's sponsorship, the Air Force continued to provide approximately two-thirds of RAND's funding in 1965 and could inflict mortal blows on the organization. Finally, during the summer of 1965, the "Project Camelot" scandal threatened to cut off RAND's existing support for "third area" research.[827]

"Camelot" was the name of an abortive study by American University of the chances for revolution in Latin America. Sponsored by the Army, the study severely embarrassed the U.S. government when it was discovered by Chilean authorities. The fact that neither the Chilean government nor the U.S. Ambassador knew anything about the study provoked protests that led to its cancellation and caused President Johnson to declare, "I am absolutely determined that no sponsorship of foreign-area research should be undertaken which in the judgment of the Secretary of State would adversely affect United States foreign relations." As a result, Secretary of State Dean Rusk set up a fifteen-member "court" of State Department officials, the Foreign Affairs

Research Council, with power to examine, and if necessary veto, any research project of a government agency involving a foreign country and contracted to non-government researchers.

Within the Department of Defense, which had supplied RAND with most of its "third areas" research support and which was the target of RAND's proposed expansion of military research in underdeveloped countries, there was an abrupt and resounding halt placed on contracts for behavioral sciences studies in foreign countries. On 10 September, Deputy Secretary of Defense Cyrus Vance ordered each of the secretaries of the military departments to designate a single representative who would review and approve all contracts for research outside the physical sciences.[828] This included, specifically, behavioral and social science studies, opinion surveys such as those dealing with opinions on weapons systems, and economics studies. The order also pertained to the Office of the Secretary of Defense, including the defense agencies, ARPA and the Joint Chiefs of Staff.

As these events eroded the viability of his proposed strategy, however, Frank Collbohm remained adamant in rejecting all proposals for non-national security research, the opportunities for which were climbing steadily in volume and scale. On 26 May, for example, the second-in-command at RAND's Washington Office, George Tanham, had lunch with Henry Loomis, the U.S. Deputy Commissioner of Education. Loomis expressed his interest in having RAND conduct research on the ways in which new pedagogical techniques could best be disseminated to the nation's teachers.[829] During the course of this meeting, Loomis impressed Tanham with the size and anticipated growth of the Office of Education, a component of the Department of Health, Education, and Welfare that promised to play a central role in the Great Society programs. In reporting on these prospects to Collbohm, Tanham indicated that Loomis' budget was "well over a billion this year and will leap to over 3 billion next year." What really caught Tanham's interest, however, was the commissioner's confidence that his office's research budget would grow over the next few years—by several hundred million dollars. On 16 June, however, Collbohm rejected Tanham's proposal, stating, "I have considered the request . . . and have discussed it with . . . the Research Council. All inputs I have been able to get, including my own view, generally add up to a negative response."[830]

By the middle of the summer, events seemed to be heading towards a confrontation. On 18 June, RAND's board chairman, Frank Stanton, met with Secretary Zuckert and was informed of the Air Force's willingness to abandon Project RAND. In defiance, RAND's Executive Committee, on 23 July, reaffirmed its commitment to defending RAND's "corporate independence, its fiscal stability, its freedom and objectivity in selecting, pursuing and reporting its program of work, and its special relationship with the Air Force."[831]

Also, by this time, Frank Collbohm's support among RAND's trustees was evaporating. As momentum developed behind proposals to diversify RAND's research agenda beyond national security issues, a growing number of RAND trustees opined that a change of leadership might be required. Furthermore, Collbohm's poor relations with the civilian leaders of the Department of Defense were a matter of deep concern. Eugene Zuckert's surprise resignation as Air Force Secretary (under pressure from Secretary of Defense McNamara) and his replacement by McNamara protégé Harold Brown in mid-1965 assured that, in the future, RAND would be considerably more dependent on the goodwill of the Secretary of Defense than on that of the Air Force. As RAND's basis of support shifted away from the Air Force, Collbohm's closeness to and influence among Air Force officials lost relevance. At the same time, the deep-seated animosities between Collbohm and RAND's expatriates in the Office of the Secretary of Defense became an ever larger handicap. Indeed, by this time Collbohm's personal relations with the Secretary of Defense could only be described as abysmal, as is made clear in Collbohm's account of his relationship with McNamara:

> [E]very time I was at a cocktail party in Washington when McNamara was there, I kept track of where he was and always stayed on the opposite end of the room. As he'd be walking around, I'd keep away from him. I didn't want to talk to him or be seen talking to him.[832]

By the fall of 1965, RAND needed a dramatic restructuring if it were going to solidify its relationship with the Secretary of Defense, stabilize its association with the Air Force—now under the leadership of Harold Brown—and take advantage of the opportunities offered by diversification into social welfare research. Recognizing this, RAND's reconstituted board of trustees, under Frank Stanton's leadership, decided that Frank Collbohm was not the person to lead this change. On 26 August 1965, a meeting was held at the request of Secretary-designate Brown between him and the non-management members of RAND's Executive Committee. At this meeting, the previously stalled Project RAND contract negotiations were concluded with RAND accepting a reduction in its fee percentage but making no apparent surrender of autonomy. Perhaps as a further result of this conclave, a special meeting of RAND's board of trustees was held on 2 September, at which the trustees determined that Frank Collbohm would be asked to resign as president, effective upon the selection of a successor. Within days, a committee of RAND's trustees began searching for both a new leader and a new direction.

Thus, the course of events between 1962 and 1965 brought to a close the initial era of RAND's existence—an era characterized by predominant Air Force sponsorship and virtually exclusive commitment to a national security research agenda. During these years, an old order comprising veteran Cold War leaders who forged the partnership between America's scientific and military establishments—individuals such as H. Rowan Gaither, Lee DuBridge, and Frank Collbohm—lost their grip both on RAND and on national policy-making. In their stead was emerging a second generation of Cold Warriors made up of younger leaders steeped in the application of technical and scientific knowledge to policy matters. Typified by such figures as Robert McNamara, Henry Rowen, and Alain Enthoven, this coterie gained prominence as champions of "scientific" defense policy-making and, by 1965, was committed to the diffusion of these techniques to broader policy applications. Eventually, the decision to diversify from national security into social welfare policy analysis would transform RAND and take the organization to extraordinary levels of influence across the globe. Part IV of this book, which begins with the next chapter, takes up RAND's diversification from national security into social welfare policy analysis and the corporation's early experience in that difficult arena.

Back to Table of Contents

Part 4:
RAND's Early Social Welfare Research, 1967-1976

Chapter Eleven
RAND Diversifies into Social Welfare Research, 1966-1968

When in July 1966 RAND's board of trustees named Henry S. Rowen to succeed Frank Collbohm as the corporation's president, RAND was a badly listing ship.[833] It's contract negotiations with the Air Force had been deadlocked for two months, and RAND's hallways echoed with rumors that the Project RAND contract was about to be terminated. The trustees had accepted, in principle, the concept of diversification into social research and had heard the preliminary ideas of a "Future Work Team" assembled by outgoing president Frank Collbohm. Still, the corporation lacked any concrete plans for reorientation, let alone secure, substantial support for the move. Meanwhile, RAND's management estimated that, because of increasing costs and the absence of new business, the corporation faced a "gap in the coming year . . . of the order of $1,000,000."[834] Spending under the Project RAND contract on consultants, travel, and computer rental had already been cut to devote more cash to salaries, but, with temporary prospects of peace in Vietnam and concomitant cuts in RAND's Viet Cong motivation study, the gap threatened to widen.

As a research organization, RAND retained some important strengths: a professional staff of high quality, a wide range of skills in the physical and social sciences, and an organizational commitment to policy-oriented research. Yet, morale continued to erode as many staff members felt that RAND's research program had grown excessively fragmented and task-oriented, that the research of too many staff members had ossified, and that RAND had become commonplace—indistinguishable from other nonprofit corporations. RAND needed strong, energetic leadership with a vision of the future and a plan to make it happen.

In July 1966, Henry Rowen appeared to be just that leader. Few people in Washington were as closely connected to the upper crust of scientific policy analysts who dominated both Pentagon and Great Society policy-making. As the point man in transferring planning-programming-budgeting (PPB) and systems analysis from the McNamara Pentagon to the social welfare agencies, Rowen was keenly aware that federal agencies would soon be in need of considerable and expensive policy research. He was equally well aware that no equivalent to RAND existed to supply the social welfare agencies with policy research and that many top administrators favored the creation of such an organization for domestic policy purposes. Indeed, President Lyndon Johnson's Cities Message on 2 March 1965 had announced the Administration's intention that a research-oriented "Institute of Urban Development" be made part of the new Department of Housing and Urban Development.[835] According to Johnson, this institute would,

> [S]upport training of local officials in a wide range of administrative and program skills. It w[ould] administer grants to states and cities for studies and the other basic work which are the foundation of long-term programs. And it w[ould] support research aimed especially at reducing the costs of building and home construction through the development of new technology.[836]

Policy research for the new social welfare agencies was thus a potentially large and lucrative market that RAND could tap, and Rowen's primary objective as RAND's president was to lure the new urban research institute to RAND.

This chapter discusses the first year and a half of Henry Rowen's tenure as the president of RAND, from mid-1966 to the beginning of 1968. It begins with the corporation's contract stalemate with the Air Force and then focuses attention on Rowen's early strategies for leading RAND into social welfare research. The chapter explores the opportunities Rowen and his staff believed RAND could exploit, the structural changes they made within RAND to accommodate diversification, and the methods and tools that RAND carried into social policy research. In particular, the chapter concentrates on Rowen's efforts to create at RAND an urban policy research institute that would comprehensively serve the needs of the Great Society programs. This chapter thus explores RAND's early diversification experience, which included both successes and failures, and concludes with the establishment of RAND's path-breaking research partnership with New York City.

Project RAND Contract Stalemate, Summer 1966

The most pressing issue that faced RAND upon Henry Rowen's appointment was the ongoing deadlock in the corporation's Project RAND negotiations with the Air Force. By the summer of 1966, the Department of Defense (DOD) was under heavy pressure from both the Congress and the news media to restructure and substantially diminish its relationships with nonprofit corporations. The previous summer, the Subcommittee for Special Investigations (Hardy Subcommittee) of the House Armed Services Committee had conducted a painstaking investigation of the operation and management of the Aerospace Corporation and its relations with the Air Force.[837] Of particular concern in this investigation was DOD's payment of fee income and an allowance for building depreciation to the nonprofits. Congressional critics disparaged the nonprofits as untaxed and noncompetitive corporations. They argued that fees and depreciation costs amounted to government-funded guaranteed profits for firms like RAND. This attack was particularly discomforting to RAND since Aerospace had come under intense scrutiny for a fee level that was a little more than half of RAND's.[838]

The negotiations for the fiscal year (FY) 1967 Project RAND contract began ominously on 13 April 1966 when Frank Stanton, the chairman of RAND's board of trustees, received a call from Secretary of the Air Force Harold Brown.[839] Brown informed Stanton that he was sending a letter to General Bernard Schriever, chief of the Air Force Systems Command, that established the ground rules for negotiations with Aerospace, MITRE, and System Development Corporation. Secretary Brown advised Stanton that the letter would soon be published, implying that RAND's upcoming negotiations would have to conform to the same rules. On 2 May 1966, Stephen Shulman, the Air Force General Counsel, telephoned outgoing RAND president Frank Collbohm and confirmed that the Brown-Schriever negotiation guidelines would be applied to the Project RAND negotiations. Collbohm and Shulman agreed to meet in Washington on 9 May to discuss the matter.

That meeting made it clear that while the Air Force recognized the differences between RAND and the other nonprofits, particularly its espoused pursuit of basic research, the Air Force faced irresistible pressure to achieve lower fees with all the nonprofit corporations. Over the summer months, RAND and the Air Force conducted grueling but inconclusive negotiations over the Project RAND contract. The Air Force pressed relentlessly for considerable reductions in

RAND's fee and depreciation allowances, while RAND negotiators made it clear that RAND found these reductions to be wholly unacceptable.

As negotiations became increasingly bitter, many at RAND began to suspect that the Air Force intended to terminate Project RAND and would use the deadlocked negotiations to justify that move. On 14 July 1966, the executive committee of RAND's board of trustees met in Santa Monica and arrived at two crucial decisions. First, with the management members of the executive committee out of the room, the trustees voted to offer RAND's presidency to Henry Rowen. Second, the trustees decided to elevate the Project RAND contract negotiations to the highest level of authority. On 26 July, RAND trustees Frank Stanton and William Hewlett met with Secretary of the Air Force Brown to press for a compromise. Brown assured the RAND trustees that the Air Force desired the continuation of the Project RAND relationship but that he and Secretary of Defense McNamara were under considerable political and public pressure to cut the nonprofits' fixed fees. He argued,

> If you're getting 6 percent from your other clients, you will not be getting 6 percent from your other clients two years from now because [Congress is] going to get after them too. After they finish with the Air Force, the Congressional people are going to get after everybody else, and they've already gotten after OSD and IDA. . . . [Y]ou can't stand an investigation like the Porter Hardy investigation of Aerospace. . . . [Y]our first class travel policy is just terribly vulnerable.[840]

Finally, in mid-August as RAND and the Air Force exchanged further proposals, an innovative idea emerged. During a meeting in Washington between RAND and Air Force negotiators, RAND treasurer Scott King asked if the Air Force would consider a five-year Project RAND contract with annual funding subject to budget availability but with the fee percentage fixed over the life of the agreement. The Air Force agreed that such an arrangement would be possible and, under the existing circumstances, might serve the interests of both sides. For RAND, it provided a degree of security that, while not guaranteed at any fixed contract dollar level, provided the corporation with a five-year "grace period" during which it could aggressively pursue its diversification into social research without the threat that the Air Force would unilaterally terminate Project RAND. In exchange for this security, RAND was willing to make concessions on the fee amount. For the Air Force, this fee concession would allow it to continue its relationship with RAND and avoid the harshest criticism of Congress. At last, on 2 November 1966 the two sides agreed to a five-year contract with a fee of 4.75 percent and allowances for building depreciation. Thus, despite the added damage inflicted on RAND-Air Force relations by on the extended contract deadlock, the result of the ordeal was to provide Henry Rowen—who had accepted the RAND trustees' offer in July—with desperately needed breathing room as he planned RAND's diversification into social welfare research.

Rowen Takes Charge at RAND

Henry Rowen was an exceptionally promising choice for RAND's presidency in 1966. For a tired, shaken organization looking for leadership and new directions, the forty-one year-old Rowen offered energy, invaluable connections to both defense and non-defense government agencies, and a vision for the future. A native Bostonian, Rowen was trained as an economist and industrial engineer at the Massachusetts Institute of Technology during the late 1940s and began his career at RAND in September 1950. He earned his spurs in the organization working with Albert Wohlstetter on the renowned "Strategic Basing Study" of the mid-1950s, spent

considerable time with Charles Hitch helping to develop program budgeting, and was one of RAND's leading scientific strategists. On 17 March 1961, Rowen left RAND to become Deputy Assistant Secretary of Defense for International Security Affairs under Robert McNamara. There, he specialized in problems relating to the North Atlantic Treaty Organization and was instrumental in the establishment of the Defense Working Group—an analytical group that sought to rejuvenate NATO's long-term planning in dealing with non-nuclear threats in Europe.

When President Johnson mandated the application of Department of Defense program budgeting methods throughout the federal government in 1965, Rowen was the designated missionary and was appointed to the assistant directorship of the Bureau of the Budget. In this position, until his formal assumption of RAND's presidency on 1 January 1967, Rowen worked with planning and budgeting officials throughout the diverse agencies of the federal bureaucracy and gained an intimate understanding of their research needs. In his return to RAND, therefore, he brought not only his experience and relations with top Department of Defense officials but also perhaps the nation's single best network of contacts among the agencies and departments currently implementing the burgeoning Great Society programs. In his first address to RAND's staff, just two weeks after the announcement of his appointment on 27 July 1966, Rowen made clear his intention to lead RAND in a new direction. He stated,

> The crucial problems of the rest of this decade and the 1970's-80's are clearly very different from those of the 1950's and the early '60's. . . . Not all of these central problems are in defense and foreign affairs. Some are at home. I have been greatly impressed while in the Executive Office of the President by the need for research and analysis on domestic problems comparable to that done on defense. The range of important and interesting problems here is enormous: education, health, crime, urban problems, poverty.[841]

Henry Rowen's conceptualization of RAND's place in the "national interest" differed fundamentally from Frank Collbohm's. Shaped by World War II and the toe-to-toe U.S.-Soviet confrontation of the early Cold War, Collbohm's ideas centered on the primacy of global military superiority. An engineer who grew up in blue collar Pittsburgh, Collbohm had a deep distrust for "eastern" intellectuals and the news media. As RAND's president, he was determined to keep the corporation both out of public view and dedicated to military problems. Rowen, on the other hand, was thoroughly enmeshed in the east coast network of "defense intellectuals" and had used his expertise in RAND's analytical methods to vault himself to the pinnacle of national policy-making. He had no reservations about leveraging his connections to move RAND to the forefront of both defense and domestic policy analysis.

Like many Cold Warriors of his era, Rowen believed in the fundamental connection between American social stability and military strength. In the life-and-death struggle between the communist Soviet Union and the capitalist United States, the society that most efficiently and rationally harnessed all its resources, social as well as military, to the conflict would surely prevail. For example, Rowen conceptualized the problems of African-American poverty as the embedding within United States society of a backward, essentially third-world society. As Rowen testified before Congress in 1967:

> The heart of this problem has been located by some observers in the Negro culture, family, and social structure generally. In a real sense, it is comparable to the problems of development in many underdeveloped countries Both in sections of the "third world" and in the Negro community, there is a self-sustaining negative cycle which preserves elements which are strongly resistant to modernization or social developments.[842]

Rowen believed that American society could not achieve its full productive potential if large segments remained essentially unindustrialized.

Between his appointment as RAND's president in July 1966 and taking office on 1 January 1967, Rowen used his position as Assistant Director of the Bureau of the Budget to sell to top administration officials his idea that a Great Society policy research center be established at RAND. For example, on 13 December 1966, Rowen wrote a memorandum to William Hooper of the White House Office of Science and Technology outlining the Department of Housing and Urban Development's (HUD's) needs for an "urban RAND."[843] Rowen argued that HUD's policy research needs fell into two groups: (1) those related directly to current program responsibilities, and (2) those related to the urban environment but not directly to current HUD programs. While the first class of research needs, Rowen believed, should be met by a research and engineering effort within HUD, the broader, longer term research program had to be addressed through the creation of an independent "Urban Institute" funded by HUD but located in a nonprofit corporation. Although HUD would determine the general research agenda for the institute, "most of its research effort would be internally determined by the [institute's] staff."[844] In other words, Rowen argued for the creation of a social welfare research institute be created at RAND that mimicked the original RAND-Air Force arrangement.

Such an independent research institute, Rowen argued, had crucial advantages over either the use of universities for policy research or the performance of research by the government itself. In his memorandum to Hooper, Rowen made the following plea for creation of a non-profit research institute:

> It escapes governmental pay and other irrationalities. It offers the possibility of being more of a problem-solving, focused institution than academic research centers usually are. With luck, one can even get some interdisciplinary research. It is especially important, and especially difficult, to get a fair amount of interdisciplinary work done in any such organization. Universities are notoriously bad at this and private firms generally don't have the necessary breadth of talent.[845]

Upon taking office at RAND, Rowen pursued three strategies designed to facilitate RAND's diversification from national security into social welfare research: he worked to improve RAND's capacity for performing such research, he used his contacts throughout the federal administrative structure to identify research funding opportunities, and he continued his efforts to land the national urban research institute for RAND. Under the first of these strategies, Rowen intended to re-deploy RAND's considerable analytical expertise in the solution of domestic social problems. RAND had already accumulated considerable experience in social research both as a function of its contract defense research and as a component of its RAND-sponsored research program. In addition, during the late 1950s and early 1960s, the corporation also had engaged in a number of relatively small social research projects funded by private foundations. The first such effort took place in 1958 when Joseph Kershaw, an economist, proposed a pilot study of the economics of public school education to the Ford Foundation.[846] Ford was receptive to the idea. After inviting Kershaw and Roland McKean to New York for meetings in September of that year, the foundation extended RAND a $35,000 grant to assess the applicability of systems analysis for studies of elementary and secondary education in the United States. The result of this pilot study was a paper by Kershaw and McKean, "Decision-making in the Schools: An Outsider's View,"[847] as well as the extension of a second grant of $30,000 for a study of the structure of public school salaries.[848]

These studies set the stage for RAND's receipt of a much larger, $500,000 grant from the Ford Foundation in 1960 for a three-year analysis of urban transportation systems.[849] Ford and RAND designed this program to develop basic data and problem-solving techniques that would be of use to the agencies working on specific problems in urban transportation. As such, it included a survey of the existing, "state of the art" urban transportation studies, an analysis of the vehicles and structures of current and proposed modes of urban transport, and the development of a general urban simulation model. RAND researchers quickly concluded that no comprehensive analyses of the technical characteristics of the various transport modes had, as yet, been made. To fill this gap, they developed engineering analyses of both existing and potential means of transportation that described the physical characteristics of the vehicles and their attendant infrastructures, performance characteristics, and the range of costs that each implied. RAND researchers working on the project had hoped, originally, to construct a general urban simulation model that could be used to project the spatial distribution of activities within a metropolitan area, the travel patterns resulting from these land uses, and the interaction of transportation networks and land use patterns. The program was not continued after 1963 when its original grant expired —a circumstance that may have been related to the growing antagonism of RAND's leadership towards non-military research. Similar research in urban systems was continued in 1963, but only under the rubric of national defense when RAND researchers conducted analyses of urban social problems in Saigon [now Ho Chi Minh City] for the Assistant Secretary of Defense for International Security Affairs.

While these early projects introduced many RAND staff members to social research problems, the projects were almost uniformly small in size and short in duration and did not represent a coordinated or systematic entry by the corporation to the field. In 1966, Henry Rowen and his closest assistants had something entirely different in mind. They sought not the haphazard accretion of dissimilar, short-lived research projects but the creation within RAND of a federally-sponsored institute for urban policy research in which RAND researchers employed the methodological resources they had accumulated over twenty years of national defense research. This meant, first and foremost, the application of systems analysis to social policy problems.

RAND researchers had already achieved a variety of methodological innovations in such areas as cost analysis, game theory, applied mathematics, and artificial intelligence during the 1940s and 1950s. However, the methodology that was most closely associated with RAND was systems analysis. In his essay, "Methodological Developments at RAND," Gene H. Fisher defined systems analysis as,

> the systematic examination and comparison of alternative future sources of action in terms of their expected costs, benefits and risks. While quantitative methods of analysis are used as much as possible, qualitative analysis must often be used to supplement the quantitative work. The main purpose of system analysis is to provide information to decision-makers that will sharpen their intuition and judgment and hopefully provide the basis for more informed choices.[850]

Upon his return to RAND, Rowen believed that the corporation's most valuable asset in its diversification would be its experience and expertise in applying systems analysis to complex problems. However, systems analysis—as well as RAND's practice of systems analysis—would have to be transformed to cope with the peculiar problems involved in social policy research. Paul Armer[851], a member of the "Future Work Team" that was laying the groundwork for diversification when Rowen arrived, commented, "It is important to realize that we have spent many years in the national security area understanding the basic issues and parameters of the

problem. We do not have this basic understanding in the new areas to which we may take the tools we have developed, and consequently we must anticipate that these tools may not serve us as well immediately. . . ."[852]

The application of systems analysis to non-military problems posed a series of difficult challenges; to meet these challenges RAND had to re-engineer and re-deploy systems analysis itself.[853] First, social welfare issues are more often characterized by an interrelationship of problems, especially situations in which the solution of one problem might be the cause of another, than is the case in defense analyses. For example, satisfactory school integration policies can not be developed without careful study of housing patterns and possibilities. Thus RAND's social systems analysts had to define the boundaries of their analyses according to logical criteria rather than such traditional social conventions as political jurisdictions and academic disciplines.

Second, systems analyses of social policy issues have to confront a wider range of potential solutions—legislative and technical, public and private, local and national—than is the case in national security analysis. Furthermore, Americans' cultural bias towards technical solutions to public policy problems, whether in the defense of social welfare arena, often constrained adequate consideration of policy choices aimed at changing underlying institutions or behaviors. RAND's social systems analysts would have to be conscious of this bias and be willing to identify and evaluate non-technological solutions to social problems. This would prove difficult at RAND where technically proficient scholars pervaded analytical efforts.

A reevaluation of the "criteria problem" that had plagued RAND's early national defense analyses was a third consideration in adapting systems analysis to social welfare problems. The performance of meaningful cost-benefit analyses in the social welfare sectors entails careful measurement of costs and the recognition that the social costs of a given policy choice might take many forms. These include dollar costs to individuals or organizations as well as more subtle costs, such as discomfort, conflict, or sickness, that can be assigned only uncertain monetary values. While social systems analyses can not account satisfactorily for all of these factors, the comparative costs of policy alternatives, in both monetary and nonmonetary terms, must be identified as precisely as possible.

Not only would RAND have to reassess the nature of costs in adapting systems analysis to social issues, but the rigorous identification of probable benefits also presented new problems. Like anticipated costs, the benefits of social programs are extremely difficult to evaluate. In the first place, a social policy systems analysis must specify by what criteria the benefits might be judged. This raises problems such as the differences in value preferences among society's various members, difficulties in making interpersonal comparisons, and the challenges of developing effective mechanisms for resolving value conflicts. A second difficulty in benefits analysis is uncertainty in actually measuring or assigning value preferences, if any exist. This dilemma is compounded by the need to estimate the future consequences of present actions—in essence the time-value of preferences. Finally, social systems analyses must engage perhaps the toughest problem of all, that of determining who should benefit from a given policy and who should not.

Furthermore, the data needed to conduct systems analyses on such complex issues as urban renewal, supersonic transports, and public television, would be difficult to obtain, plagued with biases, and operationally unwieldy. As a result, the application of systems analysis to social issues demands an extensive use of reliable social experiments. As Rowen and his staff recognized in the late 1960s, a critical intellectual component of RAND's diversification into social welfare research would be the development of rigorous techniques of experimentation in complicated social problems. RAND's systems analysts would have to generate or secure reliable, consistent data so as to make policy evaluations that would be defensible—a task more challenging in social policy matters than was the case in defense issues.

However, Rowen believed that as RAND developed experience in designing and conducting social experiments, the corporation's growing skills would create new contract opportunities as the government's expenditures on social programs accelerated. As federal agencies explored policy alternatives in areas such as public order, health, and education, some of their greatest needs would lie in the design and evaluation of experimental or pilot programs. Rowen expected, correctly, that RAND could offer to meet these needs with carefully analyzed and technically sophisticated methods of experiment. RAND's national health care experiment of the 1970s and 1980s exemplifies Rowen's accuracy in anticipating this need.

The determination of social policy outcomes is another area in which RAND's military systems analysis techniques had to be modified for social welfare applications. Any serious attempts to evaluate the success of social programs draws researchers into the dangerous territories of social accounting. Social welfare systems analyses thus have to incorporate systems of policy output measurement that adequately reflect the goals of given programs and allow for comparisons between programs. When RAND undertook its diversification, no such body of techniques existed.

Finally, systems analysis has to incorporate a rigorous understanding of the processes of social change if it is to be of use to social welfare decision-makers. It was thus of fundamental importance for RAND's analysts to comprehend the processes by which social choices are made, including the decision-making processes within and among governments, the processes by which individuals are informed, and the ways in which individuals develop and express their values politically. Such analyses decision processes, especially government processes, can not be neglected since they often limited the range of feasible policy alternatives.

Henry Rowen and his management team recognized that systems analysis, as it existed at RAND in the 1960s, would have to be altered substantially and improved if it were to deal meaningfully with the vast complexity of social problems like racism and hunger. In a letter to Robert McNamara in April 1967, Rowen pointed out that while "systems analyses of military equipment and operations . . . is now almost conventional methodology . . . there is no systematic method for taking into account the various organizational, political, and social factors" involved in social systems analysis.[854] To correct this, the RAND staff planned to re-invent systems analysis by folding into it broader conceptualizations of uncertainty as well as newer methodologies under development elsewhere. For example, Daniel Ellsberg suggested that advances in decision theory (e.g., subjective probability), developments in planning theory and practice being pursued in parts of Europe, experiences gained in the Department of Defense as program budgeting systems matured, and recent advances in social science experimentation be incorporated into the existing methodology.[855] Furthermore, Ellsberg pointed out that the spread of systems analysis had engendered a body of criticism, some of which was being produced at RAND, concerning the limitations of the techniques. Such criticism could be an important source of insight and intellectual stimulation as the methodology was honed for its new tasks.[856]

Pursuit of Social Welfare Funding Opportunities

When Rowen's appointment was announced in July 1966, there was virtually no research of social problems underway at RAND. RAND's anticipated budget for 1967 included approximately $21.8 million of research support, consisting of nineteen contracts and the annual RAND-sponsored research allotment.[857] The only portion of this budget dealing with social research, however, was RAND's continuing participation in the joint ARPA-ISA Viet Cong morale and motivation study, worth approximately $346,000.[858] Nevertheless, considerable effort to explore possible avenues of diversification was already underway at RAND. This effort

consisted primarily of the ongoing work of the "Future Work Team" assembled by Frank Collbohm during the previous spring, which had made an initial recommendation for social research to the board of trustees in April. George H. Clement, RAND's Operations Manager and the coordinator of the Future Work Team, initiated contact with the incoming Henry Rowen by early August. Clement and the president-designate agreed that it would be imperative to present a logical, coordinated diversification strategy to the trustees at their November meetings. To prepare for these meetings, Rowen and the RAND staff moved quickly.

By early September, Clement had assigned members of his team to lead small groups in producing "reasoned appraisals" of RAND's potential work in six areas: crime, education, health, program budgeting, urban and regional problems, and systems analysis training.[859] These appraisals were to include lists of potential clients, statements of the types of problems RAND might address in each area, an assessment of RAND's current strengths and past experiences in the area, and a survey of weaknesses that RAND might have and the problems it might encounter. The initial analyses were due by 1 October. Paul Armer, as head of the team's steering committee, would then direct the construction of a plan of action based on the appraisals.

Rowen and Clement believed that RAND should leverage existing and potential points of contact outside the corporation in a carefully concerted manner. Clement wrote to Rowen, "I have asked each person involved to inform me, prior to taking any action, of any contacts he proposes to make outside of RAND and what he expects to accomplish by the contact. In this way I hope to keep things under control and will coordinate with you prior to authorizing these contacts."[860] Such coordination, they believed, would allow RAND to make the most of Rowen's numerous contacts within the federal government, especially in identifying opportunities and spreading the word of RAND's new agenda. By 7 September, Clement had put together a partial list of contacts to be pursued immediately, including, within the federal government, the departments of Housing and Urban Development (HUD), Health, Education and Welfare (HEW), and Commerce, the Office of Economic Opportunity, the Agency for International Development, and the Bureau of the Budget. His list also included the National Science Foundation, the Ford Foundation, the Brookings Institution, the State of California, the State of New York, the City of New York, Detroit's municipal government, the League of Cities, and various universities.[861]

Still, the apparent abundance of opportunities did not mask the anticipated difficulties of social research. As they methodically constructed a strategy for diversification, Rowen and the Future Work Team had to keep in mind that entry to this new field threatened both to continue the corporation's trend towards task-orientation in research contracts and to engulf the organization in a morass of political struggles. In terms of the former, Joseph Goldsen, for example, found innumerable opportunities for RAND to help federal, state, and municipal agencies operate more efficiently or more effectively. Yet, he wondered, "do we want to become efficiency experts and trouble-shooters, even though the need is great and the funding becomes available?"[862] Even if RAND chose to avoid this type of work, many RAND researchers cautioned that the fractured nature of responsibility for social problems among a plethora of organizations and agencies would tend to fragment and dissipate the corporation's research efforts. Many RAND managers worried that the content of a domestic social research program would consist almost exclusively of applied research.

Also, RAND's top managers and staff believed, almost to a person, that social research and policy analysis would prove far more complex and messy than issues of U.S. national security. They argued that although dealing with the military was far from ideal, RAND's traditional clientele consisted of fewer pressure groups, bore less direct public scrutiny, and were more completely concentrated at the federal level than would be the case with customers in the fields of public order, health, and housing. As Goldsen noted, in attacking "big questions" of social

change in a highly advanced industrial society, "incentives for and resistances against changing the distribution of benefits . . . are supercharged with emotion, traditional beliefs, attitudes, economic interest, [and] political control."[863] He warned that RAND, as an intellectual community, had to come to terms with the fundamentally different nature of domestic social problems and not allow "foot-in-the-door" necessity to postpone or prevent such reflection.

In addition to these problems, Henry Rowen and the management team had to remain cognizant of persistent stresses within RAND and the political realities of their position. Foremost, they had to recognize that RAND's decision to diversify was recent, had been arrived at only after considerable anguish, and was not supported enthusiastically by all of the corporation's trustees. Frank Collbohm, still the titular president of the organization, undoubtedly retained important influence on the board and within the Air Force. Furthermore, Rowen's conversations with Harold Brown in August had made it clear that the Air Force was not at all pleased with its relationship with RAND, especially as the contract negotiations ground forward at a seeming geological pace. As work commenced on Rowen's diversification plan and its presentation to the board of trustees, Rowen warned Paul Armer,

> [M]embers of the Board have been hearing from DOD and the Air Force that RAND isn't doing as well as it should on existing contracts. . . . Therefore, the Board's reaction may be "Why are you out to find new worlds to conquer when you aren't doing your main job well?" For this reason . . . the presentation re new work should make us appear prudent; we should avoid an "oh-boy-let's-go-gung-ho" kind of attitude. The emphasis should be on proceeding slowly in an exploratory fashion. . . .[864]

Rowen was aware that he had numerous detractors in the Air Force and even among the staff in Santa Monica. He and his team would have to chart carefully a path forward that did not waste precious time or resources on dead-end initiatives, and they would have to do so in less than one month.

RAND's Diversification Plan

In light of these considerations, RAND's management put together a presentation for the November board meetings that was built around six primary topics: management's assumptions in diversification, its criteria for selecting new areas of study, alternative diversification strategies, anticipated problems, new topics of research under consideration, and management's plans to proceed. The first of these, management's assumptions, allowed Rowen and his team to discuss the forces that they felt were shaping their decisions. This section began with reassurances that the management team was driven by the cultural imperatives of independence and basic research. The Future Work Team pointed out that while rapid changes in RAND's environment prevented the corporation from standing pat, management was confident that avenues for growth could be found that protected RAND's historic long-term perspective on national problems, its emphasis on basic research, and its tradition of freedom and flexibility in its research programs.

Rowen and the Future Work Team recognized that social research was a departure from the past, but they stressed that this step was in no way an abandonment of national security by RAND. Indeed, the new management team argued that the changing international environment was eroding the distinctions between national security and social research, and that non-DOD work by no means meant that RAND's research would not contribute to national defense. Future Work Team member Paul Armer wrote, "Research in science and technology is appropriate for both security and welfare"; in the future these would have to be pursued in tandem.[865] Finally,

management expressed its confidence that RAND could accommodate changes in its environment and continue to prosper, pointing out that RAND had never been a static organization and could expect to find financial support for any problems on which it chose to work.

The management team then laid out the criteria they were using to evaluate the alternative diversification strategies available to RAND. Recognizing that RAND could not enter all fields of social research, the management team attempted systematically to identify those that appeared most promising. Rowen and his team argued that, in general terms, intellectual criteria dictated the fields RAND would enter. Such fields must be "important," contain challenging interests for learned professionals, allow the pursuit of original scholarly work and methodological innovation, and present problems whose nature would combine present, practical problems with a need to conceptualize and plan for future issues. Also, the management team expressed its concern with the sponsorship of future research: Was funding available to support work in the field? Did the client organizations have some power to act on RAND's recommendations? Finally, and more specific to RAND as an organization, management sought research opportunities that would require expertise that could be found at RAND or feasibly recruited, that encouraged interdisciplinary analyses, and that complemented existing research programs. Finally, RAND management sought opportunities that would allow RAND to work with clients that "understood" its research process and would be willing to let RAND work in the style that "has played such a major role in RAND's past success."[866]

These criteria allowed the management team to identify several alternative diversification strategies. First, the corporation might gain experience and expertise by accepting some of the tasks that had already been proposed by prospective clients. For example, RAND could immediately accept work on such topics as health systems, marine resources, and Alaskan communications systems. Alternatively, rather than accept such offers of specific work, the Future Work Team suggested that the corporation might build a basic understanding of social research through a more gradual application of RAND corporate funds, private foundation support, or even Department of Defense funds. In the case of DOD funding, management argued that it would be possible, although politically dangerous, to structure the research under Project RAND so as to maximize its social research content. This would allow RAND to prepare itself for more radical diversification while still satisfying the Air Force's research needs.[867] In concluding their discussion of alternative strategies, the management team indicated that RAND could and probably should pursue some combination of these alternatives.

These alternatives presented a variety of problems for which management hoped to plan effectively. In the fourth segment of its presentation, the team identified the most important internal and external problems that the corporation would confront. In the case of matters internal to the organization, Rowen and his staff believed that sponsorship of social research would be more diffuse, thus creating a demand for additional management and administration, especially project-oriented management, that would be capable of transcending departmental boundaries to complete research programs. As management noted in its presentation, "the work involved in these new areas will demand a degree of interdisciplinary cooperation, the fulfillment of which is likely to require a new approach to getting interdisciplinary efforts carried out."[868] Also, diversification would create demands for a new mix of skills within RAND, which implied that the corporation's recruiting practices would have to be evaluated and restructured.

This problem of skills presented management with something of a chicken-and-egg dilemma: before securing contracts in new areas the corporation had to have capabilities in those areas, yet in its present capital-poor condition RAND could ill-afford to create new capabilities in the absence of new research contracts. Finally, because of the nature of RAND's historic relationship with the Air Force, the corporation had never been marketing- or sales-oriented. The pursuit of

social research contracts, especially in the increasingly competitive external environment, required that RAND be both familiar with and responsive to the market for research contracts. This situation made it imperative that the corporation take an effective and aggressive posture towards marketing its services.

Anticipating problems that might arise in the environment external to RAND as diversification proceeded, the management team pointed out a number of concerns. First, as noted above, the management team found that diversification might contribute to the increasing task-orientation of RAND's research program and threatened to embroil the corporation in a web of intransigent social and political conflicts. Also, they cautioned that in entering social research, RAND's efforts would increasingly be undertaken "in a fishbowl," thus inviting the criticism of for-profit competitors and, potentially, the U.S. Congress. Finally, management wondered to what extent RAND's entry to non-military fields of research would alienate existing clients, especially the Air Force. In this case, the Future Work Team offered evidence that the expected negative reaction of the Air Force might be mitigated by support for the move from the Secretary of Defense. During a meeting in August 1966, Rowen had broached the subject of RAND's intended diversification into domestic social research with Secretary McNamara who "responded very favorably" to the news.[869]

Having presented these anticipated difficulties and the ground rules under which they were pursuing diversification, Rowen's management group went on to make its recommendations for the future. First, they explored the specific areas of social research that seemed to offer the most attractive opportunities for RAND. In essence, these areas were the six study areas for which "reasoned appraisals" had been prepared in September, with the addition of oceanography and waste management—two specific opportunities that recently had come to management's attention. Finally, the Future Work Team recommended to the board that the corporation pursue some of the specific opportunities that had presented themselves over the previous few months. These included health systems, marine resources, Alaskan communications problems, and the possibility for expanded work for the Agency for International Development. In addition, they also requested permission to continue the Future Work Team task force activities with the objectives of selecting one or two research areas that could be pursued with RAND funding, exploring untapped contract sources, and identifying one or two areas in which support for basic research might be proposed to the Ford Foundation.

RAND's Initial Social Research Opportunities

Over the next months, the Future Work Team worked closely with Henry Rowen to activate plans for RAND's diversification into domestic social research. After taking office at RAND in January 1967, Rowen immediately traveled to the East Coast to visit HEW, HUD, AID, the Office of Economic Opportunity (OEO), and the Port Authority of New York to explore the possibilities of research contracts between RAND and each of these bodies.

One of the earliest and most promising social research opportunities he pursued was in the field of education. In January 1967, R. Louis Bright, the Associate Commissioner for Research in HEW's Office of Education, informed Rowen that his office was planning to launch a series of education research centers that would provide information to education policy-makers.[870] Bright indicated that this research work would eventually be performed by two or more interdisciplinary, systems-oriented research centers whose primary task would be to analyze future educational needs and resources and, in light of these analyses, provide policy makers with relevant information and techniques for decision making. Clearly, Bright considered RAND to be a top candidate to host one of the research centers.

Bright's proposal held special interest for RAND because it offered considerable freedom to the research contractor and, presumably, the opportunity to perform both basic and applied research. Bright's letter indicated that the specific topics addressed would be determined jointly by the centers and HEW's Bureau of Research on a 40-30-30 percentage basis. That is, 40 percent of the center's time would be devoted to subjects suggested by the bureau, 30 percent to subjects jointly agreed upon, and 30 percent to subjects initiated solely by the center. This would allow the centers the freedom to pursue the educational policy implications of important social developments and devote attention to the development of appropriate theories.

Also, as a consequence of Rowen's visit to HEW in January 1967, the RAND president met on 15 February 1967 with Harold Howe, Henry Loomis's successor as the U.S. Commissioner of Education to discuss RAND's participation in studies of instructional television and broader questions of the uses of technology in education. At that meeting, Rowen agreed that this would be an excellent focus for RAND's initial involvement in education analyses and, in a subsequent letter to Howe, estimated that a "meaningful" study of this topic could be conducted over eighteen months at a contract amount of $500,000.[871] On 2 March, RAND sent to Commissioner Howe a formal proposal for research in which RAND would undertake studies of the roles that technology could play in the educational process. This proposal emphasized the nascent state of instructional television and the alternative systems into which it could be embedded.[872]

Rowen's visits to HEW during early 1967 also opened research opportunities in the field of health care. Along with its educational program, RAND's 2 March proposal included a large-scale project in health care studies that would be carried out by researchers inside government, at universities, at research institutes, and in private industry. RAND would play a central role in this ambitious body of work by hosting an institute for health care research that would support an ongoing program of study and involve as many as fifty professional staff members. The program Rowen proposed would promote the training of health policy analysts and would be supported on a continuing institutional basis. RAND would play a primary role in determining the institute's research agenda, thus permitting RAND's researchers the freedom to pursue problems they felt were most interesting. While providing ample opportunity for researchers to address theoretical issues, the program would be devoted explicitly to practical improvement of the health system, and the research effort would be formulated and carried out with this objective in mind. Rowen was careful to point out that while helping federal and state health agencies with policy analysis, the RAND institute would not assume governmental responsibilities such as policy choice or implementation.

The proposed health care research not only opened new opportunities for RAND, it also dovetailed nicely with ongoing national security research. At the time of the proposal, RAND was also expanding its research on Department of Defense personnel policies and problems, especially those related to the military's health care systems. Furthermore, the research for HEW in health systems would complement the corporation's anticipated research on urban social systems.

Another research opportunity that emerged from Rowen's East Coast trip in early 1967 was in transportation systems analysis.[873] As noted above, RAND had performed extensive research of urban transportation systems during the early 1960s under a grant from the Ford Foundation. In the fall of 1966, Rowen and his staff worked to take advantage of their connections among the leaders of the federal government's new Department of Transportation (DOT) and especially with former RAND analyst Charles Zwick who had chaired the interagency federal task force that drafted DOT's enabling legislation.[874] As had been the case with its early NASA work, RAND was willing to sacrifice, in the short run, its concentration on broad research issues to get its foot in the door with the new client. For the Department of Transportation, RAND proposed to study

very specific technological problems, such as the use of sensors for measuring traffic flow rates, with an eye towards concluding a long-term, umbrella contract similar to the Project RAND arrangement. In his "reasoned appraisal" of work in transportation, RAND's David Masson identified two opportunities for immediate research: an analysis of future implications of very large transport and supersonic transport aircraft for airport management in New York City and analysis of surface traffic flow and safety in urban areas. In the former case, subsequent to Henry Rowen's visit to the Port Authority of New York in January 1967, RAND proposed and received a research contract on long-range airport problems. This initial contact with New York City officials set the stage for RAND's largest early foray into social welfare policy analysis—an enterprise that is detailed in the next chapter.

Restructuring RAND for Diversification

Rowen's efforts to diversify RAND's research program were not, however, confined to identifying and pursuing new support opportunities. He and his staff also effected a reorganization of RAND that centralized management authority and, Rowen believed, prepared the corporation to do business with a wider array of clients. In late 1967, Rowen estimated that "Within three years, the number of professionals engaged on domestic problems should be around 100, with at least 25 percent of their support coming from non governmental sources."[875] To accommodate this growth and change in support bases, Rowen and his team worked to address two primary problems: the limitations created by the organization's departmental structure, and the corporation's lack of personnel in disciplines required for diversified research.

RAND's decentralized departmental structure had been a source of internal criticism since the corporation's reorganization of 1960. Critics claimed that the 1960 structure vested near autonomy in the department managers and choked off meaningful efforts in interdepartmental "program" research. Frank Collbohm attempted to appease these critics in 1964 with the appointment of "program managers" to coordinate two of RAND's most explicitly interdisciplinary research projects. By January 1967, this modest change had failed to stimulate cross-departmental research, and Rowen's team recognized that more radical surgery would be required if RAND were going to accommodate the interdisciplinary demands of social research.

In January 1967, RAND's management committee devoted lengthy discussion to the issue of project management and the shortcomings of current interdisciplinary research.[876] During the meeting, a sharp difference of opinion between RAND's department heads and Rowen's corporate staff became apparent. Rowen and his team agreed with the current program managers that it was imperative to improve the rewards given to interdisciplinary study participants by allowing project leaders' involvement in salary reviews and other personnel decisions. The department leaders, however, argued that they were best able to direct a balance between interdepartmental studies and discipline-specific research efforts. They held that informally organized two- to three-person teams performed RAND's best interdisciplinary work. As such, they claimed that any efforts to force interdisciplinary cooperation by altering the corporate structure threatened to hamstring productive informal arrangements in a web of bureaucratic procedures. However, as minutes of the committee meeting prepared by one of Rowen's assistants note, "This Department Head complacency was not shared by others."[877]

At the time of this meeting, RAND's organizational structure comprised eleven departments: Aero-Astronautics, Computer Sciences, Cost Analysis, Economics, Electronics, Geophysics and Astronomy, Logistics, Mathematics, Physics, Social Science, and System Operations. Despite their differing opinions on the merits of the existing structure, RAND managers agreed that, in the words of RAND economist James Schlesinger, "There is no good way to structure RAND."[878]

Since 1950, RAND had adhered to a university-style discipline-driven structure so that staff members would remain involved, intellectually, in their particular fields. This also facilitated recruitment by assuring researchers that when they took jobs at RAND they would not disappear from their professional communities. RAND's discipline-driven structure, however, encouraged researchers to concentrate on departmental research projects and thus contribute little to the study of broad policy problems. Rowen believed that, in Schlesinger's words, "To achieve better RAND-wide collaboration there will have to be a house-cleaning. . . ."[879]

Rowen took his first action in this direction when in March 1967 he created two new executive positions, the Vice President for Research and the Vice President for Programs. He established these positions because he sought to concentrate the authority for interdepartmental research projects at an organizational level on par with that of the department heads. The creation of these executive positions provided Rowen with a mechanism for asserting centralized authority over program research and creating a context in which organizational power could gradually be drained away from the department heads and pumped into a functional program organization. The responsibilities vested in the Vice President for Research focused on the coordination of the Project RAND research program and other defense-related studies. The Vice President for Programs, alternately, was to coordinate RAND's social research programs. Unfortunately, Rowen's selection for the latter position, Marvin Stern, does not appear to have fit well into this role and he left RAND after only a few months. At that point, due to the Air Force's refusal to fund either of the vice presidential positions, the Vice President for Programs slot was eliminated, and the Vice President for Research assumed the duties that had been assigned to this position.

The new Vice President for Research, Bruno Augenstein, was a close ally of Rowen's during RAND's restructuring and provided many of the ideas that Rowen eventually implemented. Augenstein—an astrophysicist who played a key role in initiating the American ICBM program in the early 1950s—had been a member of RAND's research staff from 1949 to 1958. In 1967, he was serving as the research adviser to President Johnson and vice president of the Institute for Defense Analyses. Rowen described Augenstein as "a person of extraordinarily broad abilities, which range from aerodynamics and information theory to human cognitive processes."[880] The new Vice President for Research was also of one mind with Rowen in his conceptualization of RAND's organizational needs. He believed that in the future RAND's primary contributions would not be in basic scientific research but in intellectual synthesis. Augenstein wrote that RAND would thus be,

> the unique place where a number of results are synthesized to provide new insights, where a number of methodological tools are developed or exploited and applied to new areas, and sharpened in the process, where the end objective of the research is to provide major attacks and inroads into those centrally important public policy problem areas where the issues are very complex. . . .[881]

Augenstein lamented, however, that the construction of an organization that could effectively balance deep, productive disciplinary research with broad, interdisciplinary problem solving was probably a practical impossibility. In a lengthy letter to Rowen written early in Rowen's tenure, Augenstein presented his ideas for RAND's reorganization and argued that Rowen must conduct an assault on the organizational power of the department heads. He laid out nine alternative strategies that RAND could pursue, ranging from maintenance of the status quo, which would be the least "upsetting," to the division of RAND into customer-oriented groupings that would cut

across the existing departments, resulting in a clear program orientation but "an ineffective and confused internal arrangement."[882]

Three and a half months after assuming office, Rowen circulated to the department heads and executive management his plan for the establishing a more balanced system of departmental and program management. The keystone of this plan was the creation of "study area" directors who would report directly to the Vice President for Research and oversee the corporation's most important interdisciplinary research programs. In this way, Rowen's plan combined RAND's existing departmental structure with a new, independent functional organization. In essence, the department heads remained first-line managers who reported directly to the president and who were responsible for planning, organizing, staffing, coordinating, and controlling the operations of their respective departments, within budgetary constraints. These individuals also retained influence over the shaping of corporate research policy and important interdisciplinary research programs through their positions as members of RAND's Management Committee.[883]

To balance this disciplinary organization, however, Rowen created a tier of middle managers, called study area directors who would report to the vice president for research and would be responsible for developing interdisciplinary research programs. At first, Rowen appointed two such middle managers, the Director of Strategic Studies and the Director of Tactical Studies, to oversee RAND's main military program efforts. As RAND's domestic social research programs coalesced, Rowen planned to adopt a similar structure of management there as well. A group of program managers, whose number would fluctuate according to RAND's research agenda, would report to these study area directors. Finally, the individuals comprising the research program teams would continue to be drawn from the departments.

To strengthen the position of these functional groups, however, Rowen made several changes that reduced the dependence of the program managers on the department heads. First, he mandated that research personnel be rotated between the departments and the interdisciplinary programs on a regular basis. To add teeth to this decree, he further instructed that henceforth the study area directors would participate with department heads in the evaluation of researchers. Also, the programs were allotted independent funding from the total funds available to RAND. Unlike in past circumstances, these funds would no longer be "owed" by the projects to the departments but would be under the control of the program managers and the study area directors.[884]

Beyond effecting these changes in RAND's organizational structure, Rowen and his staff also sought to alter RAND's skill mixture so that it would be in closer harmony with the intended diversification. In a letter to Robert McNamara, Rowen noted that the recent changes in RAND's program would require the corporation to invest more heavily in fields such as anthropology, sociology, education, psychology, and medicine.[885] Also, RAND's new research directions increased its appetite for social scientists with advanced quantitative abilities. RAND's increased demands for such scholars mirrored a general trend in academia towards quantitative social science, however, so recruitment of qualified researchers promised to be difficult. As a partial solution to this recruitment problem, Bruno Augenstein suggested that RAND "encourage either split time university assignments, or tr[y] to recruit university people on leave for full time RAND employment."[886] In the physical sciences and engineering, recruiting was altered so as to place greater emphasis on candidates who were particularly adept in applied subjects and those with some degree of social science training.[887]

Rowen's Urban Institute Proposals

As Henry Rowen and his management staff were restructuring RAND and pursuing research opportunities in early 1967, Rowen remained focused on his primary objective—creating at RAND a central urban research institute that would provide a scientific basis for the programs of the Great Society. During the autumn of 1966, Rowen used his central position within the federal government to advertise his ideas concerning a central policy research institute, and by April 1967 he had completed a second draft proposal for a "Research and Training Institute on Problems of Urban Society." Rowen sent copies of this proposal to Secretary of Defense McNamara and his assistant Adam Yarmolinsky, and he used their suggestions in subsequent revisions. Rowen's April 1967 draft, however, crystallized his plans for an urban research institute at RAND:

> The aim is to create a major Institute for policy research on problems of society. Among these are problems of race, education, public order, housing, health care, transportation, pollution, and the quality of the environment in general. These problems are complex, inadequately understood and strongly interactive. . . . [N]ew requirements are imposed on our system of government and on social research, and the Institute here proposed can be an important instrument for providing the research needed to enable us to make better social choices. The research objectives of the Institute will be to improve social choices, to improve policy decisions.[888]

Rowen's proposal argued that RAND provided an optimal situation for the social research institute for several reasons. First, the pursuit of applied research at universities, he reasoned, would tend to "disrupt and threaten the university's primary missions of basic research and education."[889] Second, the federal government could not take on this task as an in-house activity because "[n]owhere in our governmental structure is there sufficient freedom from political and institutional constraints . . . to set up a domestic research program that would have the size, the independence, the long term lease on life, and the quality that would permit us to seriously test our society's ability to turn its resources to the solution of domestic problems."[890] RAND, on the other hand, had extensive experience in the application of social science theory and systems analysis to policy research, and it had access to the crucial decision-makers who required social research.

Furthermore, Rowen argued that RAND's historic, albeit informal, role as the nation's leading training center for systems analysts further strengthened its claim as the optimal location for a central urban policy research institute. Writing to Secretary McNamara about his envisaged institute for urban policy research, Rowen argued that "the most valuable product RAND has produced—without especially intending to do so—is trained people."[891] In fact, as Rowen pointed out in his institute proposal, between 1960 and 1967, "more people from the RAND staff have received Presidential appointments than from any other institution in the country with the exception of the Harvard University faculty."[892] RAND also played a critical role in disseminating systems analysis methods by developing and conducting systems analysis training seminars for military personnel as well as social welfare administrators in 1954, 1959, and 1964-65. In essence, RAND had been functioning as a training academy for systems analysts for twenty years, and Rowen's urban institute would simply formalize this role.

More specifically, Rowen proposed an urban policy research institute at RAND that would be the center for interdisciplinary research of social problems such as health care, education, housing, transportation, public order, pollution, and the quality of urban environments. Its work would engage social scientists, natural scientists, and engineers in problems requiring social

choices, especially on substantive issues that allowed both the application of existing theory and the development new theories. The training of graduate students and young professionals in social research and analysis also occupied a central place in Rowen's design. Whether or not the institute would actually grant degrees and how it would be associated organizationally with the existing corporation remained unclear. However, Rowen most frequently described the institute as situated within RAND but clearly separated from the corporation's defense research efforts.

Creation of the Urban Institute, 1967-68

Henry Rowen's efforts to create at RAND a social research institute that would serve the needs of the Great Society gained momentum on 17 April 1967 when President Lyndon Johnson asked Congress for substantial funding for urban policy research. In his special message to the Congress on urban and rural poverty, Johnson emphasized the need for urban research, announcing that he had requested the Secretary of Housing and Urban Development to expand his program of research and "encourage the establishment of an institute for urban development as a separate and distinct organization."[893] In response, Secretary Robert C. Weaver[894] established an Office of Urban Technology and Research, selected a director for this office who was charged with preparing a comprehensive department-wide R&D program budget, and submitted a $20,000,000 "Urban Research and Technology" program budget to the Congress.[895]

To promote RAND as the locus for the anticipated federal urban research institute, Rowen and his staff secured contracts with both the Department of Transportation and the Department of Housing and Urban Development to conduct research programs during the summer of 1967. RAND's summer program on transportation, for example, included a series of one-week study programs held during July and August. RAND invited experts representing "the spectrum of transportation endeavors from urban transportation operation to federal transportation policy development and implementation" to participate in the studies.[896] Once at RAND, the visiting experts worked with RAND staff members engaged in research concerning transportation systems and their economic and social impacts. The study programs commenced on 10 July and each concentrated on a particular transportation issue, such as decision-making for federal transportation projects, financing urban transportation, the role of transportation systems in urban/regional development, air safety, transportation centers in the urban complex, organization and operation of regional airport complexes, and highway safety.[897]

Conducted in cooperation with HUD, RAND's summer urban program consisted of three seminar sessions at which participants were asked to identify researchable problems pertinent to federal urban policy-making and program formulation. Seminar participants included representatives of HUD, members of RAND's staff, and consultants selected for relevant knowledge and experience. Following each of the seminars, participants prepared memoranda that explored research ideas or argued for research approaches. In particular, participants were asked for ideas on data-gathering programs, research strategies, and on the possible influence of research findings on federal policies. Like the transportation program, the RAND organizers focused each of the three HUD seminars on a specific topic, within which the participants defined problems that were amenable to systems analysis.[898]

In addition to creating the summer research programs, Rowen organized a conference on 13-14 May 1967 to gather advice on and support for his proposed urban policy research institute. This conference brought together prominent academics, top-level federal policy-makers, and officials from private non-profit sponsors, especially the Ford Foundation, for two days of discussion at the Santa Ynez Inn, just north of RAND's Santa Monica headquarters. The twenty-eight conference attendees included a wide range of academics including Rowen's mentor, Albert

Wohlstetter—by then a faculty member at the University of Chicago—as well as former RAND analyst Charles Zwick, Assistant Director of the Bureau of the Budget, and Thomas F. Rogers of the Department of Housing and Urban Development.[899] The meeting agenda consisted of a series of questions focusing around several main topics concerning Rowen's proposed urban research institute: the need for such an organization, its scope, its organizational structure, possible sources of research funding, the institute's relationship to universities, and its relationship to RAND (independent or component).

Attendees agreed on both the urgent need for an urban policy research center and the difficulty Rowen and his team would have in creating one. The conferees found that RAND would provide an excellent venue in which technologists and social scientists could cooperate on problem-solving, but concluded that funding would be a critical concern. Hooper records,

> The history of Rand was explored in an effort to identify crucial lessons. It was generally agreed that Rand benefited from having a rich, 'stupid' client who was not interested in meddling in the affairs of Rand or in receiving answers during the early years. The present environment for an urban research group is entirely different.[900]

The conferees agreed that because of the fragmented nature of social research support, an endowment for the research institute would be preferable but would be difficult to generate. As an alternative, the participants advised that RAND cultivate some kind of long-term support guarantee of at least five years duration.

In terms of the urban research institute's organization, the conference attendees recommended that the center not be formed under the jurisdiction of RAND's board of trustees but that a separate board with overlapping members be established. Corporate officers could be the same for each institution. The attendees suggested that the new urban center be housed in a building located in close proximity to but separate from RAND. With respect to organizational structure, Rowen championed the creation of an institution having departments tailored to academic disciplines and project assignments bridging disciplines—in essence, an organization identical to that which his recent restructuring of RAND had created. The conference participants appear to have been amenable to this structure, and they recommended a minimum effective institute size of about twenty full-time senior staff at salaries from $25,000 to $35,000 plus consultants, post-doctoral scholars, interns, and graduate students. Correspondingly, they estimated the institute's initial budget needs to be approximately $2.5 million per annum.[901]

Henry Rowen's aggressive moves to create at RAND a center for federal social policy research were not, however, supported by several key White House administrators. In fact, the success of Rowen's conference at RAND motivated Joseph A Califano, Jr., President Johnson's top lieutenant in implementing the Great Society, to begin constructing a new policy research center that would short-circuit Rowen's plans—a center that would become known as the Urban Institute. Califano believed that the administration could generate considerable favorable publicity by creating its own urban research institute, and he had no intention of sharing that publicity with Henry Rowen. On 18 May 1967, White House aide James Gaither—the son of RAND Corporation's deceased chairman and founder H. Rowen Gaither, Jr.—reported to Califano that,

> Charlie Zwick attended a meeting last weekend to discuss the formation of an Urban Institute at Rand. Apparently, most of the leading thinkers in the field (such as Yarmolinsky) and Ford Foundation representatives were present. The reaction was unanimously favorable.[902]

Gaither reported that while details concerning the financing and structure of RAND's institute were not resolved at the conference, "If Rand acts first, there w[ill] be little talent left for HUD."[903] Given White House consensus that the creation of an urban research institute was desirable, Gaither recommended that Califano convene a meeting to discuss the situation that would include Robert C. Weaver, Secretary of HUD; Robert C. Wood[904], Under Secretary of HUD; Charles Schultze, Director of the Bureau of the Budget; and Charles Zwick, Assistant Budget Director. Gaither further recommended that Califano ask Zwick to submit a full report of the RAND conference in preparation for this meeting. In the style of the Johnson White House, Califano checked the "approved" box on Gaither's memorandum.

Subsequent to Gaither's memorandum, Califano organized a meeting on 30 June 1967 to discuss the creation of an "Institute for Urban Development." This meeting included Califano, Gaither, Weaver, Wood, Schultze, and Zwick, as well as William Gorham, the Assistant Secretary of Health, Education, and Welfare, and former RAND analyst Fred S. Hoffman, Rowen's replacement in the Bureau of the Budget.[905] At the meeting, two alternative forms for the urban research institute emerged: (1) an organization like RAND that would "put some bright people to work thinking 'deep, broad thoughts' about the problems of cities in general," and (2) a more limited operation designed "to re-examine and evaluate Federal efforts aimed at cities, such as rent supplements, urban redevelopment, and so forth."[906]

The key players in determining the institute's structure and function would be HUD's Secretary Weaver and Under Secretary Wood. Following the meeting, Weaver sent Califano a memorandum outlining his positions concerning the urban research institute. Of significance to RAND, Weaver expressed an initial willingness to situate the new urban research institute within an existing non-profit organization, such as RAND. In his memorandum, he argued, "there seems to be little reason to accept the difficulties and delays inherent in the organization of any new 'not-for-profit' if one or more of the superior existing ones would be willing to consider its own modification and expansion."[907] However, as Califano's assistant, Frederick Bohen, wrote later, Weaver's interests in establishing the institute were primarily institutional.[908] His primary objective was to stretch the new Department of Housing and Urban Development's administrative mandate as far as possible, thereby conferred additional prestige on the department and his secretariat. As such, Weaver was not particularly concerned whether the institute was a new creation or a unit of RAND.

Weaver's Under Secretary, Robert Wood, on the other hand, had a much more personal stake in the creation of the urban research institute, and he strongly supported its independence from RAND. Wood had been an early champion of an "urban RAND," and in late 1966, while Henry Rowen was shopping around the idea that it should be a component of RAND, Wood advanced a counterproposal. In a memorandum written in late December 1966 and titled, "A National Program for Urban Research," Wood recommended that HUD create a new non-profit corporation to house the "Institute of Urban Development" and provide it with an outside board of trustees.[909] As Wood later wrote to Secretary Weaver of such an institute, "It seems harmless and we're in control."[910] Later, Frederick Bohen offered additional insights to Wood's motivations during mid-1967 when he wrote to Califano that Wood appeared "to have personalized his role as Under Secretary of HUD and creator of the Institute. I think he s[ees] the Institute as a way of dressing up HUD's image for creative thought and programs in the constituencies he really cares about—the university and intellectuals generally."[911]

In July 1967, Califano appointed Robert Wood to chair an intra-governmental task force charged with laying the groundwork for the urban research institute.[912] Califano asked this task force to recommend the following: (a) the specific mission and general objectives of the institute; (b) the scope and substance of its research, with specific attention to urban problems covered,

public policy issues, types of studies, disciplines covered, and research priorities; and (c) alternative organizational approaches to its creation with related recommendations concerning criteria for comparing these alternatives.[913] The Wood Committee reported its conclusions to Califano on 11 October 1967 and, not surprisingly, advised the creation of the urban research institute as a new non-profit corporation.[914] According to the Wood Committee report, this corporation would have a board of directors selected by the President and an "Institute Executive" selected by the board of directors with the consent of the Secretary of HUD. The institute would have "substantial, but not comprehensive in-house analytic capability which conducts some research itself and also develops a discrete number (4-6) of satellite research centers and other research centers related to universities."[915] Despite its apparent independence, however, the institute recommended by the Wood Committee would be closely controlled by HUD. According to the report, "The 'Institute' should look directly to the Department of Housing and Urban Development: (a) for day-to-day guidance and consistent concern for its product and well-being; (b) for its major contract funding; and (c) for general administrative instructions."[916] In other words, the apparently independent institute would be closely supervised by HUD so that its research would not challenge HUD policies.[917]

On 21 November 1967, Joseph Califano passed the Wood Committee's recommendations for a "privately-chartered, non-profit corporation" on to President Johnson for his approval.[918] In his memorandum to the President, Califano pointed out that, "In short, the Urban Research Institute would be something like the Rand Corporation."[919] It would receive a continuing base of financial support from HUD, but the bulk of its funds would come from research contracts with diverse federal agencies, as well as state and local governments. Furthermore, Califano said, "In the future . . . it could provide a reservoir of professional, analytic talent which could be tapped by special commissions such as the Riot Commission. . . ." Finally, Califano emphasized that the creation of an independent institute would achieve the President's primary objective—to maximize its political impact: "[W]e should announce the way we are proceeding on [the Urban Institute] at a briefing when you return from the ranch. This should get excellent coverage if we do it well with the right reporters."[920] Not surprisingly, the "approved" box on Califano's memorandum is graced with a large checkmark.

With Johnson's approval, Califano arranged a press conference on 6 December 1967 to announce the creation of the Urban Institute. At that press conference, Califano announced that the institute would be set up along the lines established earlier in the fall by the Wood Committee, and concentrate on the application of RAND's systems analysis methods to urban policy problems. Indeed, during the press conference Califano repeatedly referenced RAND to characterize the nature and function of the Urban Institute. For example, with regard to the new institute's ties with HUD, he said,

> The relation of the institute to HUD will be analogous to the relationship of Rand to the Air Force, initially, and eventually to the Department of Defense. You will recall that Rand did, among other things, the following kinds of things for the Air Force. Initially, it made available a substantial body of advanced technology. It developed cost benefit ratios for weapons systems. It developed all sorts of mathematical models for solving Air Force and Defense problems.[921]

However, Califano made it clear that he intended the new Urban Institute to be an entirely new organization built to serve the needs of the Great Society. During the 6 December press conference, Califano also announced the creation of a distinguished "incorporating panel" whose

members, which included Secretary of Defense McNamara and Ford Foundation president McGeorge Bundy, would work over the next few months to get the institute up and running.[922]

For Henry Rowen, the deliberations of the Urban Institute's incorporating committee in December 1967 and early 1968 offered a last gasp of hope for securing the Urban Institute for RAND. Since his departure from the Bureau of the Budget for RAND, Rowen had maintained close contact with Secretary of Defense McNamara and had passed on to the Secretary early drafts of his proposal for an urban research center at RAND. In July 1967, Rowen met with McNamara and Deputy Secretary of Defense Paul Nitze to discuss RAND's diversification into social research.[923] At that meeting, Rowen described the steps he was taking to bring into existence the urban research institute and, in a memorandum recording the meeting, reported that "McNamara said that he was delighted with the concept."[924] McNamara also asked for "a paper from [Rowen] outlining a research program and the cost of carrying it out. . . . He said that he wanted to give high priority to Rand."

Rowen was delighted that McNamara was one of the persons named by Califano to the Urban Institute's incorporating committee. Better still, during the committee's first meeting, its members expressed their uniform displeasure with the Wood Committee's plan for the institute and determined to conduct a comprehensive review of the plan. According to Fred Bohen, Califano's representative to the incorporating panel, "They threw out the Task Force Report on the Institute on the grounds that the conception of the Institute was parochial and the proposed organizational ties [to HUD] stifling to the Institute's independence, character and scope."[925]

At the incorporating panel's initial meeting in December 1967, McNamara raised the possibility of situating the Urban Institute within RAND. According to meeting minutes prepared by Bohen, "Secretary McNamara said he was sure that Rand could accept the assignment and do it well, but he reserved judgment on the desirability of employing Rand as the chosen instrument of the Incorporating Committee."[926] McGeorge Bundy[927], the former National Security Advisor and then-president of the Ford Foundation, also "expressed his belief that the Committee should articulate the advantages and disadvantages of a Rand association and reach a judgment on these issues."[928] However, both Secretary Weaver and Under Secretary Wood moved quickly to put out this fire. According to Bohen,

> Secretary Weaver expressed outspoken opposition to association of the new Institute with Rand for both political and intellectual reasons. Under Secretary Wood underscored his opposition and added that when Rand was established it had moved into an intellectual vacuum instead of a situation where many other advanced efforts were underway. He explained that Rand experience and capabilities are quite different from those which the Institute will require.[929]

Probably as a consequence of this adamant opposition, McNamara did not further pursue the connection of the Urban Institute to RAND but focused his efforts on ensuring the new center's independence from HUD. As a result, the incorporating panel abandoned the Wood Committee's recommendations for close HUD oversight of the Urban Institute and adopted the policy that "The Institute should be independent in two respects: (1) Independent of any parochial ties to the government, to any individual department or agency; and (2) Independent of existing research institutions, universities, not-for-profit corporations, and profit-making bodies."[930] Rowen's aspirations for creating a central Great Society research center at RAND were dashed.

Nevertheless, the Urban Institute created by the Johnson administration during 1968 was nearly a clone of RAND. The backgrounds of the institute's earliest recruits, for example, illustrate the new organization's genealogical debt to RAND. Its first president, William Gorham,

was a RAND analyst from 1953 to 1962 who served as Deputy Assistant Secretary of Defense during 1962-1965 and was responsible for the implementation of program budgeting and systems analysis in the Department of Health, Education, and Welfare from 1965 to 1968. Furthermore, as Gorham reported to the Urban Institute's trustees, the organization's first nine research staff members included an engineer-systems analyst known for his work in developing the National Military Command and Control System, a mathematician-philosopher from the Department of Health, Education and Welfare with demonstrated competence in conducting complex analyses and evaluations of federal programs, a professor of political science who had devoted the previous fifteen years to military strategy questions, a political scientist-budget analyst with extensive experience in evaluating federal housing and urban development programs from the Bureau of the Budget, and a physical chemist well versed in systems analysis.[931]

When the Urban Institute's incorporating panel completed its recommendations, Califano acted quickly to block RAND's access to social policy research funding. Among its conclusions, the incorporating panel recommended that "all Federal Agencies who have responsibilities in urban affairs should provide financial support to the Institute, to insure that its output is both comprehensive and not dominated by any single perspective."[932] Califano therefore immediately applied considerable pressure on the federal government's social welfare policy-makers to channel their research funds to the Urban Institute. On 3 January 1968, Califano sent a memorandum to the heads of the federal social welfare agencies asking each to "identify and commit some Departmental research funds already appropriated for FY '68 and in the budget for FY '69 to the proposed Institute."[933] To those individuals who could not find immediate funds for the Urban Institute, Califano directed a sterner message:

> Some weeks ago, in response to my memorandum of January 3rd requesting each of the domestic agencies to earmark or commit a modest share of available research funds in FY '68 and FY '69 to the Institute for Urban Development, you replied that [department name] could not reply affirmatively to that request.
>
> Although several domestic agencies have replied affirmatively, the members of the Incorporating Committee nominated by the President to get the Institute organized have reiterated to him their recommendation that all of the domestic agencies with a major responsibility for urban problems share in the initial financing of the Institute—both capital and contract—to insure its comprehensiveness and enhance its political strength and attractiveness to potential staff. . . . Would you please take another look at this issue . . . and let me have your final reply for transmission to the Committee and to the President by close of business Wednesday, January 31st.[934]

As might be expected, this message brought a uniformly favorable response from the Cabinet members.

Thus rewarded for his use of political leverage, Califano expanded the scope of his fund-raising on behalf of the Urban Institute. In April 1968, he sent a memorandum to President Johnson saying, "I think it would be a good idea to send out the Urban Institute materials to the 50 State Governors, the Mayors of the 100 largest cities, and the presidents of the major state and private universities with an interest in urban affairs."[935] With Johnson's approval, Califano sent to the mayors of seventy-one U.S. cities and the governors of all fifty states letters that described the capabilities of the Urban Institute, emphasized President Johnson's personal endorsement of the institute, and encouraged recipients to develop working relationships with the institute.[936] It is

indeed difficult to imagine tougher competition for Henry Rowen's plan to find clients for RAND in the public sector.

RAND's Diversification after the Urban Institute

Considering Henry Rowen's intimate connections among both the defense and social welfare officials of the Johnson administration, it must have been apparent to him by the early fall of 1967 that the Urban Institute was slipping from his grasp. Rowen and his staff would have to cultivate sources of funding other than the federal agencies. To do this, RAND embarked, during 1967, on an extensive development program designed to identify and exploit non-government sources of social research funding.

Rowen's "Institute" proposals consistently estimated that a viable social research organization would need approximately $5 million to be spent over a four or five year period.[937] However, Rowen recognized that the construction of a funding package for social welfare research presented a far more complex problem than it did for national defense research. Since the Department of Defense was a centralized bureaucracy with a hierarchical chain of command and expansive authority over defense issues, it was able to support a broadly defined research program. In contrast, minute fragmentation of social policy-making responsibility, compounded by overlapping and often conflicting jurisdictions among federal, state, and local agencies precluded support for a unified and broad research program by a single agency. Thus, what was needed in the social welfare field, according to Rowen, was "not a replica of the RAND Defense Department relationship, but rather the functional equivalent of that relationship—a much more complex matter."[938]

Although complicated, Rowen and his team were confident that a social research equivalent to the Project RAND contract could be found. Specifically, they intended to create an endowment-style base of support for the organization. Staff member Fred Ikle, for example, argued that the development of such a fund was the only way in which RAND could differentiate itself from the growing herd of more task-oriented nonprofit organizations seeking social policy analysis contracts.[939] To pursue this goal, Rowen organized a series of special committees to attack various aspects of the problem. First, he created a development steering committee chaired by Gustave Shubert, who soon would be appointed RAND's vice president for development, and comprising staff members William Graham, Fred Ikle, David Novick, Robert R. Rapp, and Robert Specht. The corporation's board of trustees also appointed a special committee on development that included trustees Michael Ference, Caryl Haskins, William Hewlett, Newton Minow, Lauris Norstad, Don K. Price, Henry Rowen, and David Shepard. Finally, Rowen organized a group of consultants, including Albert Wohlstetter, to assist management in the development efforts and a university board of advisors to provide further advice and contacts.[940]

The information generated by these groups, in particular by the special committee of the board of trustees, indicated that RAND's best bets for long-term support would be among industrial sponsors and larger private foundations.[941] With respect to the former, Rowen believed that the fearsome crescendo of urban violence during the 1960s could be used by RAND to drum up corporate social research funds. In a presentation to RAND's board, he argued that RAND might recruit funds "from insurance companies and banks with large investments in urban areas; from some of the nation's larger firms whose managements are concerned about the significance of recent outbreaks of violence for the nation's stability; [and] from wealthy individuals who might be persuaded to direct their philanthropic activities to Rand's new efforts rather than to more traditional areas."[942]

As such, Rowen and his staff worked first to leverage the corporate connections made possible by RAND's board of trustees. As discussed in Chapter Six, above, RAND's board had transformed itself during the early 1960s such that it included significant industrial representation. In particular, by 1965 RAND's board included two vice presidents of Standard Oil of New Jersey (now Exxon Corporation), and by 1968 RAND's board chairman was Standard Oil executive vice president David A. Shepard. Indeed, Rowen's efforts to plumb oil industry interest in social research illustrate both his and RAND's position at the center of the American military-industrial-social welfare policy web. During Rowen's 21 July 1967 meeting with Secretary of Defense McNamara and Deputy Secretary Nitze, Nitze had suggested that RAND look into the relationship between U.S. general foreign policy interests and the behavior of the oil companies. According to Rowen's memorandum documenting the meeting, McNamara and Nitze "suggested that a situation in which much of the oil for Europe was produced by U.S. oil companies led the Europeans to press us to protect sources of energy, but without commitments or action on their part."[943] This posed considerable strategic problems for the U.S., especially in light of the rapidly deteriorating political situation of the Middle East.

Rowen subsequently used RAND's board contacts to plumb oil companies' willingness to support a program of research that would be profitable to both industrial and Pentagon interests. According to Fred Bohen, whom Califano had ordered to keep an eye on RAND's efforts to create an urban policy institute, during the fall of 1967 Rowen was recruiting "an unholy alliance of self-appointed academics from the West Coast (largely from the Rand Corporation), and the National Industrial Conference Board" in support of his social policy research institute.[944] Bohen further reported that the Ford Foundation had tentatively promised $500,000 in support of this private policy research institute intended to perform "long term analysis and delineation of critical social, economic and demographic trends in our society, and the implications of these trends for major national choices."[945]

By April 1968, RAND had worked out preliminary plans for a program of research with R. M. Lewis, an economist on the staff of Standard Oil's chairman Michael L. Haider.[946] Standard Oil wanted RAND to perform "environmental analyses"—studies that would anticipate social and political changes in international areas important to the oil company's strategic plans. Unfortunately, RAND's corporate charter prohibited contracts with private firms for proprietary research. To circumvent this obstacle, the Ford Foundation provided RAND with $510,000 in October 1967 for an 18-month program of social and economic research on the Middle East. This program was eventually extended such that between 1967 and September 1973 the Ford Foundation provided RAND with a total of $815,000 for Middle East studies.[947]

By late 1967, RAND's most promising source of support for social welfare research was the Ford Foundation. Ford had shown early and eager interest in social policy research and had funded much of RAND's limited efforts in that direction during the late 1950s and early 1960s, including the public education and urban transportation studies of the early 1960s. Keying on this long and close relationship between RAND and the Ford Foundation, Rowen looked to Ford for help in constructing a social policy research institute once it became clear that RAND had been shut out of the Johnson administration's new Urban Institute. In October 1967 and June 1968, Rowen and his staff forwarded extensive proposals for the institute to Ford Foundation, now under the leadership of former National Security Advisor to Presidents Kennedy and Johnson, McGeorge Bundy. Rowen asked Bundy to provide RAND a $5 million grant from Ford over five years, which "would provide the continuity and scale of research needed, and the opportunity to demonstrate the gains that can be achieved."[948] Rowen further suggested that if the results achieved by RAND during this first five years were acceptable, Ford could at that point consider even longer-term support.

Unfortunately for Rowen and RAND, the Ford Foundation found both these proposals to be unpalatable and declined the requested support. In part, this was due to Ford's heavy commitment to the new Urban Institute—RAND's biggest competitor. Joseph Califano had wisely recruited Ford Foundation president Bundy to serve on the Urban Institute's incorporating panel, and the foundation provided the institute with $250,000 in start-up capital.[949] Still, Bundy had considerable respect for RAND's research capabilities, and the enduring ties between RAND and the Ford Foundation paid dividends to Rowen's diversification efforts. Furthermore, Ford officials recognized that the new Urban Institute would not be ready to execute substantial research contracts for several years. As such, in the fall of 1967 Ford agreed to support a three-week workshop on urban studies held at RAND during December 1967 and January 1968. Moreover, within months of the foundation's refusal of RAND's second institute proposal, the Ford Foundation agreed to support RAND research on the impact of technological changes on the news media.

Of far greater importance, however, Ford played a pivotal role in establishing and sustaining the crown jewel of RAND's early diversification into social research: the New York City-RAND Institute. This innovative policy research organization provided Henry Rowen and RAND with an opportunity to overcome the disappointment of the Urban Institute and implement the systems analysis of urban problems. Its turbulent history is detailed in the next chapter as a case study of RAND's diversification into social welfare policy analysis. By 1971, the New York City-RAND Institute was the source of almost half of RAND's domestic social research efforts and, despite very considerable problems, became the cornerstone of the corporation's diversification into social welfare research.

By early 1968, then, in the face of considerable odds against them Rowen and his staff had set RAND firmly on the road towards diversification into domestic social research. During the second half of 1967 alone, the corporation had received, or expected soon to receive, contracts from the Office of Economic Opportunity ($300,000) the Department of Transportation (three contracts totaling $325,000), the Ford Foundation ($510,000 for the Middle East study), the National Institutes of Health, ($533,000), the Department of Housing and Urban Development ($250,000), the Russell Sage Foundation ($150,000), and the Kellogg Foundation ($200,000).[950] In addition, RAND had concluded a high-profile and exceptionally promising agreement that placed it, in essence, in partnership with the administration of the nation's largest city. Yet, great problems remained to be solved as the corporation moved toward domestic social research. RAND's increasingly tense relationship with Air Force leaders, the waning importance of basic research in the organization's hard science departments, and the corporation's deepening financial difficulties posed perplexing issues for Rowen and his management team. Still, Rowen had staked RAND's future to the application of systems analysis to social policy research.

Conclusion

Considerable scholarship remains to be done concerning the diffusion of systems analysis and program budgeting to the federal civilian departments and the long-run impacts this had on the American social welfare programs. While this subject goes beyond the scope of the present book, a few observations are warranted. First, systems analysis and program budgeting were developed for use in the Department of Defense (DOD), and the DOD is uniquely hierarchical among federal agencies in both its structure and its culture. The giving and taking of orders, deference to authority, and the centralization of command are intrinsic to its operation. In this sense, the DOD is a poor model for the democratic ideal many Americans hold for their government institutions. Also, the Department of Defense is unusually self-contained in the sense that it requires relatively

little coordination with other departments and agencies to prosecute its missions. Its planning-programming-budgeting system (PPB) program packages could thus identify and pursue objectives with relatively little attention to other agencies. This was not the case in the social welfare arena where an assault on, say, urban decay required the cooperation of myriad federal agencies and departments, none of which could reasonably construct a program package whose output would be urban revitalization.

This situation led to the emergence, during the 1960s of critiques of systems analysis and PPB based on the argument that because social programs are vastly complex in their political construction, they cannot be addressed by centralized, monolithic hierarchies.[951] Also, as was noted in Chapter Five, the defense problems to which systems analysis was applied were very often quite technical in content and thus lent themselves with relative ease to quantification and precise measurement. This was simply not the case in social welfare issues where the very "output" of any "weapons system" (e.g. new education curricula) could not be ascertained for years, if at all. This had severe ramifications since, as Ida Hoos argued in her biting critique, "the salient features of systems methodology in theory and practice [are]: (a) it is intolerant of and even antagonistic to unquantifiable variables; (b) it contains a bias against social and human factors; (c) its ethic is that of the marketplace; (d) it is driven by technical optimism."[952]

Furthermore, while systems analysis and PPB had been designed for military applications, their successfulness in the Department of Defense was dubious at best, and these methods held even less promise for application to social welfare problems. As McNamara made clear in his 1995 book, In Retrospect, the management and decision-making processes adopted by him and his staff contributed directly to the military debacle in Vietnam.[953] McNamara used PPB to separate planning from execution by extracting decision-making authority from lower echelons and concentrating it in the highest levels of management. Systems analysis facilitated this centralization by compensating, apparently, for the alienation of decision-makers from the locus of operations. Through systems analysis, McNamara and his staff felt empowered to replace the complexity of real life with simplified models that were lent illusory precision by their quantitative bases. Numerical data became proxies for experience, and the human content of defense problems seemed to fall with disturbing ease out of the scientific analysts' equations. Henry Rowen illustrated this tendency when he reported a conversation with Secretary of the Air Force Harold Brown in 1966:

> First, with regard to tactical air operations, in Vietnam in particular, he thinks it's just very important now that he have a war on for the Air Force, to get just a mite better idea of the effectiveness of tactical air operations. He has had the operations analysis people in the Air Staff drop everything and just work on this problem—it's a serious problem and he thinks we've been doing miserably in understanding it. . . . He knows RAND is doing a lot of work on tactical air in a model-building sense, but what he is talking about is using the Vietnamese data much more.[954]

The American public retains no image of the Vietnam War more vivid than the body counts that were broadcast nightly—a grim harvesting of data for the Pentagon decision apparatus.

This fixation on policy research and evaluation accompanied systems analysis and program budgeting as these methods diffused from the Pentagon to the federal social welfare agencies. The intense appetite for policy research created by the implementation of the PPB system can be seen first in the Pentagon where the creation of the defense PPB system in 1961 had dramatically increased RAND's menu of research and analysis projects for the OSD. To supplement these research capabilities, the OSD also created the Logistics Management Institute in 1962 to provide

systems analysis and research on logistical problems. Similarly, the post-1965 period witnessed a dramatic increase in federal expenditures for social research as "civilian RANDs" and other "policy research" institutes began to proliferate. As Robert Haveman writes, "Research support was clearly less controversial and risky than, say, community action."[955] In constant 1966 dollars, federal expenditures for poverty-related research and development grew from $2.6 to $6.1 million between 1965 and 1968, more than tripled to $19.0 million in 1971, and then more than quadrupled again by 1976 to $83.9.[956] Thus, the research-intensive structure of the Great Society programs virtually created a new and well-funded discipline: policy analysis.

In the Office of Economic Opportunity (OEO), for example, the elaboration of PPB was followed by the perception that this new administration needed its own "basic research organization, much as the Pentagon relied upon the Rand Corporation."[957] As such, in 1966 OEO provided an annual grant to create and sustain the Institute for Research on Poverty at the University of Wisconsin-Madison. Modeled closely on RAND, the Institute supported a staff of about forty economists, sociologists, and other social scientists throughout the late 1960s and 1970s. Most of these scholars also had academic appointments at the university. The creation of the Urban Institute, discussed above, is a further example of the research-intensity of RAND's management methodologies.

Finally, the top-down, technocratic allocation of resources created by systems analysis and program budgeting were profoundly undemocratic and, in a nation that prides itself on democratic principles, their use for social policy-making raises fundamental issues. Charles Zwick, a RAND analyst who succeeded Charles L. Schultze as Budget Director in 1968 argued that the "grand strategy" of PPB and systems analysis was "getting more control higher up in the system."[958] The Community Action Programs (CAPs), discussed in Chapter Eight, are a case in point. As Robert Wood notes, "the Community Action Program proceeded on a theory of direct democracy in its purest form, to empower poor people in neighborhoods with authority not only to choose among values but also among techniques of implementation."[959] However, with the construction of OEO's first four-year PPB plan by Joseph Kershaw in September 1965, CAPs were excluded from the program categories or elements. As Chapter Eight argued, the CAPs' democratizing strategy was an abomination to the scientific strategists and BOB officials who championed PPB and systems analysis. These individuals sought systematic, orderly, centrally controlled social welfare programs that would stabilize American society in the face of deepening Cold War tensions. Contrary to democratic traditions, according to Hoos, "the techniques of systems analysis can, if used astutely, remove highly charged political issues from the arena of public debate by relegating them to 'scientific' appraisal."[960] Historians must consider more rigorously how the fate of the Great Society social welfare programs was shaped by the implementation of PPB and the pervasive influences of systems analysis.

Back to Table of Contents

Chapter Twelve
RAND's Adventure in New York City, 1967-1976

The problem of delivering health services in New York City is much messier and more complicated than waging strategic nuclear war. It's easier to use our analytic techniques in nuclear war planning, partly because we've never fought a nuclear war, but also because you have relatively few and well-defined elements—planes, weapons, and targets. New York City is more like a land war, where analytic techniques are also hard to use. Land combat is less tractable. You've got to deal with foot soldiers and other human factors.

ANONYMOUS RAND Analyst
Quoted in Ford Foundation Report,
September 1971]

On 6 December 1967, President Lyndon Johnson's Special Assistant for Domestic Programs, Joseph Califano, announced the creation of the Urban Institute—a policy research institute designed to apply the RAND Corporation's systems analysis techniques to social welfare problems. Califano's announcement placed Henry Rowen in a difficult position as he worked to execute RAND's diversification from military into social welfare policy research. Rowen had assumed RAND's presidency at the beginning of 1967 with the promise of redeploying RAND's research capabilities so as to take advantage of the burgeoning federal expenditures on social welfare. On one hand, Rowen's extensive and articulate proposals for an institute for urban research had been well received by both Johnson administration officials and the leaders of key foundations, especially the Ford Foundation. Indeed, Rowen's blueprints had formed the basis for Johnson's planned Urban Institute.

By the date of Califano's announcement, however, it was clear that RAND would not be the site of the new Urban Institute. Instead, Johnson wanted to harvest all of the political fruit for himself by establishing the new institute independent of RAND. Furthermore, the intrigues of Joseph Califano and other Johnson administrators not only denied Rowen this plum, the influence of these individuals among federal agencies and the Democratic mayoralties that dominated most U.S. cities promised to make the funding of RAND's nascent urban programs a difficult task.

Clearly, Rowen and his management team at RAND had placed the corporation firmly on the path of diversification. Rowen had the support of RAND's board of trustees in his diversification strategy, and while national defense research still made up an overwhelming percentage of its funding, RAND had secured research contracts with several federal social welfare agencies. Yet the corporation had been frustrated in its attempts to secure a large and stable source of social welfare research support that mirrored the funding provided by the Air Force under Project RAND. What Rowen wanted most was a partnership for RAND that would supply both fertile grounds for social welfare research and a deep and sustainable pool of financial support for that work. As RAND faced this dilemma in late 1967, an opportunity for just such a partnership emerged with the administration of the world's largest city, New York.

This chapter tells the story of RAND's partnership with Mayor John V. Lindsay's administration of New York City during the years 1968 through 1975, a case study of the corporation's attempt to redeploy systems analysis in the arena of social welfare and urban problems. In a literal sense, Henry Rowen "bet the company" on RAND's partnership with the Lindsay administration, and the difficulties RAND experienced in New York contributed to Rowen's downfall from the RAND presidency in 1971 after only four years on the job. At the

time Rowen entered into the New York City relationship, RAND was receiving about $2 million per year for work on domestic issues from the Port of New York Authority and the Office of Economic Opportunity, the Department of Health, Education and Welfare, and other federal agencies. However, virtually all of this support was short term in nature, and the research was operationally oriented. To supplement this funding, Rowen had convinced the RAND trustees to spend $1 million of RAND's corporate funds in 1968 alone to fund social welfare projects. At that time, RAND had no endowment whatsoever, and its working capital was sufficient to meet only six weeks of current expenditures.[961]

RAND's work in New York City expanded rapidly after commencing in early 1968, and in 1969 the corporation's presence there was formally institutionalized with the creation of the New York City-RAND Institute (NYCRI). Over the next few years, NYCRI undertook thousands of studies across a wide range of topics.[962] Some projects sought to establish basic information, like the analytic catalogue the institute prepared describing all of the housing programs in effect in New York. Other studies were of a quick, operational nature, performed by one analyst in a matter of days. In this vein, NYCRI performed an analysis of the varying number of telephone operators required to handle the shifting patterns of calls for police services. Other studies were much more extensive in nature and resource usage, such as NYCRI's analysis of the economic, social, and demographic forces at work on the city's rental housing stock—a program of work that occupied six or seven researchers steadily for years. Some of the institute's work sought to apply new technology to urban services, as did NYCRI's "slippery water" experiments which demonstrated that the addition in minute amounts of long-chain polymers to the water stream in a fire hose could greatly increase both the amount of water discharged and the distance the stream would travel after leaving the hose. Finally, NYCRI researchers applied mathematical modeling techniques to urban issues, such as the model developed to estimate how water quality in Jamaica Bay would be affected by alternative waste treatment facilities, under varying tidal conditions, temperatures, and potential changes in the configuration of the bay. The consistent thread running through these research efforts, however, was the application of RAND's now codified systems analysis techniques to New York's urban problems.

Just as rapidly as RAND's research efforts in New York grew, however, NYCRI was snared in New York's political tangle. The institute's research efforts became the target of both bureaucratic infighting and heated political controversy, prompting one RAND analyst to make the comments which serve as this chapter's epigraph. Whereas Robert McNamara had found RAND's management techniques to be instrumental in reconstructing and centralizing authority in the Pentagon during the early 1960s, Mayor Lindsay was utterly unable to achieve similar results. Indeed, RAND's program of urban research in New York, which began with considerable promise, was shuttered in 1975—shortly after Lindsay's tenure ended. By that time, however, the New York City research program had provided RAND with invaluable experience in social welfare policy analysis—experience that proved to be the foundation for subsequent work in non-military areas.

Lindsay Administration and New York City Background

In 1968, New York was certainly the world's largest city and one of its most deeply troubled. Within seven years the city had essentially defaulted on its vast debt, and city government had been taken over by state and federal agencies. The litany of problems facing New York in the late 1960s was well-known at the time and seemed to defy remediation. For example:

New York City's expense budget more than doubled between 1965 and 1971, from $3.8 billion to $9.1 billion, making it the second largest public budget in the United States, second only to the U.S. government.

New York's aid for dependent children welfare caseload also more than doubled in the same period—from 345,000 people in 1965 to 885,000 in 1971.

Fire alarms more than trebled between 1965 and 1969 from 68,000 per year to over 240,000.

Landlords abandoned about 100,000 dwelling units between 1965 and 1968—enough housing to accommodate the entire population of Jersey City.

The city was undergoing a demographic transformation with the inexorable flow of the middle class from the city and their replacement by the lower class minorities.

A general deterioration of the city environment was visible and palpable in New York's streets, subways, air and water.

While these and other urban problems facing Lindsay seemed irresolvable, the political problems facing the Lindsay administration were equally confounding. The Republican Lindsay had been elected mayor of heavily Democratic New York City in 1965 in one of the closest elections in the city's history. Lindsay ran on a "Fusion" ticket that appealed to Republican, Liberal, and reform Democratic voters through a platform that promised to smash the entrenched and corrupt interests that ran the city. In the election, Lindsay defeated Democratic city comptroller Abraham Beame but carried only 44 percent of the electorate. Beame had won all of the traditional Democratic voting blocs—Jews, African-Americans, Irish, and Puerto Ricans—but not by the majorities necessary for victory. Thus, Lindsay entered office in early 1966 as a minority-vote Republican mayor in an overwhelmingly Democratic city. Furthermore, Lindsay was confronted with Democratic control of the two other crucial governing bodies in the city—the legislative and financial control branches of the government.

New York City's municipal government structure, illustrated in Chart 1, provided for tripartite governance, consisting of the mayor, the city council, and the comptroller, as well as a Board of Estimates consisting of these three plus the five borough presidents. In New York, the comptroller, whose responsibility was the financial management of the city including authorization for expenditures, was an elected official who may or may not have been of the same political affiliation (or sympathy) as the mayor. During both of Lindsay's terms as mayor, the city council and the comptroller's office were dominated by Democrats. In the case of the comptroller's office, Mario Procaccino was the incumbent during Lindsay's first term and would be Lindsay's opponent in the mayoral election of 1969. During Lindsay's second term, his opponent in the 1965 mayoral election, Abraham Beame, took over the comptroller's office from Procaccino.

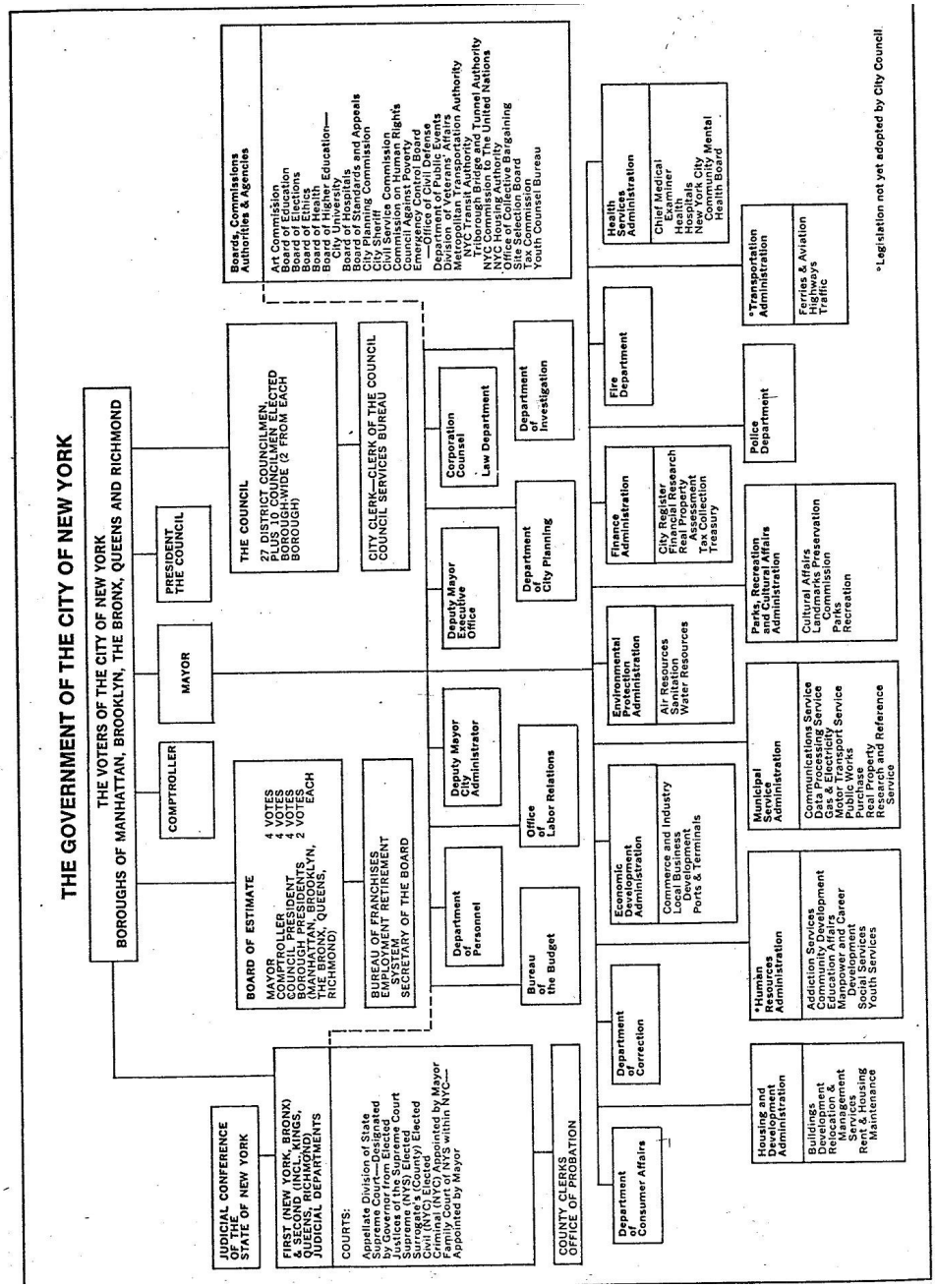


Chart 1. Source: "Case History: Splintered City and Fusion Mayor, New York's Lindsay," Government Executive, June 1969, p. 48.

Furthermore, the municipal government Lindsay was now charged with running comprised nearly 400,000 civil servants, most of whom were hostile to Lindsay's new administration. This hostility was bred from Lindsay's repeated campaign pledges to transform New York's bloated, inefficient bureaucracies by implementing the policy and systems analysis techniques pioneered by Robert McNamara in the Department of Defense. Indeed, the personal and circumstantial similarities between McNamara in 1961 and Lindsay in 1966 are striking. First, both men were impressive individuals with forceful personalities. Lindsay was the son of a wealthy New York

banker, had attended the best private schools, graduated from Yale Law School, and had become a partner in one of the city's prestigious Wall Street law firms. He was a tall, dashing figure with sandy brown hair and blue eyes. Upon taking office, Lindsay promised to bring modern, centralized management to New York's swollen bureaucracy and cut through the incessant political bickering that had paralyzed previous efforts to bring efficiency to city government. Where his predecessor, Robert Wagner, had mediated among interest groups, Lindsay intended to command.[963]

The organizational challenges facing Lindsay as he took office in 1966 bore close similarities to those encountered by Robert McNamara's when he assumed the position of Secretary of Defense in 1961. McNamara entered office determined to assert centralized control over the military services-dominated Defense Department, and he saw the implementation of "modern" management techniques to be the critical weapon in that campaign. Like McNamara's task in the Pentagon, Lindsay's job of reforming New York City government would not be easy, and he would have to overcome entrenched and politically powerful opposition. Just as the National Defense Act of 1947 had provided, nominally at least, for a strong Secretary of Defense, New York's city charter provided for a theoretically "strong" mayor. However, as the city government organization chart illustrates, actual power in New York City was widely diffused. Vetoes over policies and programs were liberally distributed among the body politic, such that any one of innumerable groups could delay, dilute, or even stop proposed program innovations.

Upon taking office, Lindsay commissioned a task force chaired by attorney Louis A. Craco to study the reorganization of city government. The Craco Committee published its report in December 1966 and stated the problem succinctly: "The increasing complexity of modern urban problems calls for more imaginative and creative development of policies and this in turn requires more sophisticated tools of government to formulate and execute those policies in a coordinated and effective manner."[964] Lindsay's first step was the reorganization of nearly one hundred of the city's disparate agencies, commissions, and boards into ten umbrella "super-agencies" organized around each of the core functions of the city government. Like McNamara's restructuring of the Department of Defense around the "outputs" of the defense establishment, Lindsay organized his super-agencies around the "outputs" of municipal government. For example, the separate departments dealing with rent control, building inspections, urban renewal, and relocation were combined into a single Housing and Development Administration, where a single administrator would be able to organize a unified attack on the problem of improving the city's housing stock. Similarly, Lindsay merged the welfare, manpower training, and anti-poverty programs in a Human Resources Administration; the departments dealing with highways, traffic control, and ferries would form a Transportation Administration; sewers, water and air pollution control, and sanitation would be an Environmental Protection Agency; and so on.[965] The purpose was to bring greater coordination to closely related functions that had previously been the responsibility of separate agencies. Another purpose was to give the mayor greater control over his bureaucracy, by reducing to ten the number of agency heads with whom he had to deal.

Intentionally reproducing McNamara's strategy, Lindsay planned to implement RAND's Planning, Programming and Budgeting System (PPBS) to centralize authority and elevate decision-making to the top of his restructured municipal government.[966] PPBS was a technocratic management system that employed systems analysis as the key policy mechanism, requiring city agencies to conduct rigorous cost-benefit analyses of policy alternatives before recommending future programs. PPBS was designed to substitute analysis for intuition, and it placed a premium on expert policy analysis over traditional political operations of the civil service. In further reflection of McNamara, Lindsay brought with him to office a coterie of young, aggressive "Whiz

Kids" who vaulted to the pinnacle of policy-making in the city and stepped on many toes in the process.

First, to head the new super-agencies—formally called "Administrations"—Lindsay searched the nation to locate expert talent who shared his vision of systematic management and commitment to institutional change. While he found such devotees in the federal government and in a few other city administrations, almost none of his initial top appointments were people whose careers had been in New York City government. What these recruits lacked in experience, however, they made up for in youth and enthusiasm. Burton Klein, a RAND economist who worked extensively on New York City problems, described Lindsay's team of young, aggressive staffers as "selfish and power-hungry," noting that at thirty-five years of age, Klein himself was among the older individuals surrounding the mayor. Peter Goldmark was typical of the new recruits. A graduate of Harvard who had worked in the federal Office of Economic Opportunity, Goldmark was hired by Lindsay, at the age of twenty-six years, to head the new division of program analysis in New York's Bureau of the Budget. Indeed, Lindsay's administration was peppered with young men whose sudden elevation and expert training distinguished them from the teeming masses of New York's civil service.

This easy distinction did not, however, always serve Lindsay well, as relations between his executive administration and the civil agencies that ran the city deteriorated quickly. Administrators who were already chaffing at Lindsay's campaign accusations of corruption and inefficiency regarded the mayor's expert assistants as insensitive youngsters looking to make reputations at the expense of workaday civil servants. Morris describes this phenomenon among the city's police force:

> Whatever the causes—the arrogance of Lindsay's aides, the unwillingness to consult before making managerial changes, the [Patrolmen's Benevolent Association]'s resistance to any change, the strident demands of the minorities . . .—the situation was deplorable. But to the cop on the beat, Lindsay symbolized every thing that was wrong and was roundly hated for it.[967]

Just as McNamara was judged harshly on the behavior of his aggressive lieutenants, Lindsay paid a steep political price for the cultural differences between his "Whiz Kids" and the bureaucrats running New York's government. And like the Secretary of Defense, Lindsay quickly looked for external reinforcements in his battle to bring systematic management to New York.

Lindsay's Efforts to Create a "RAND" for New York City

Lindsay's field commander in his reorganization of New York's municipal government was his Budget Director, Frederick O'Reilly Hayes. At age 43, Hayes was the sage of Lindsay's administration and instrumental in recruiting young, idealistic administrators. In 1964, Hayes had joined President Johnson's task force on the war on poverty, where he was a senior member of the group that developed the Community Action Program described in Chapter Six, above. After the passage of the Economic Opportunity Act, Hayes joined the newly created Office of Economic Opportunity and quickly became one of the central figures in the implementation of the Great Society programs. As Budget Director in New York, Hayes wielded enormous power since municipal agency heads who wished to deviate from their approved budgets, or establish new personnel positions, had to obtain the Budget Director's approval. Also, Hayes shared Lindsay's enthusiasm for the rational management of city affairs and, with executive authority over the budgeting process, was in a position to implement the program budgeting and program analysis

methods that RAND had introduced to the Department of Defense. The Ford Foundation described Hayes as, "the point of the spear of Mayoral innovation and change."[968]

To short-circuit the political opposition of city council and the civil service, Lindsay and Hayes planned to create a multi-million dollar nonprofit corporation that would be legally independent of the city but would perform policy analysis for the mayor's office and the municipal administration. On 24 February 1967, Hayes wrote a proposal to the Ford Foundation for a five-year grant totaling $4.5 million that would fund the establishment and operation of such an independent urban systems analysis corporation. Hayes described his proposed organization as a "RAND type corporation" that would "increase the capacity of urban government to change and to deal with the problems of modern urban society."[969] However, Hayes' proposal smacked of political instrumentalism, and Ford Foundation program officer Louis Winnick, who had been on the staff of the New York City housing administration before joining the foundation, was cool to the proposal. In his formal comments to the foundation's president, McGeorge Bundy, Winnick wrote that Lindsay was

> really asking for a $4 or $5 million personal kitty for consultants that would spare him the unpleasantries of going through the City Council and Board of Estimate who have not been impressed with the services of RAND-type guys in the past. . . . [W]ithout Council and Board involvement, the corporation would go nowhere. . . . With their endorsement the corporation wouldn't need very much of our money, except for extras.[970]

In line with Winnick's negative evaluation, Bundy declined Mayor Lindsay's request but suggested that Winnick and Hayes might hold an exploratory meeting to discuss something "at a very much lower price tag."

At the subsequent meeting, Winnick made clear to Hayes that his chief concerns were the dollar amount of the request and the absence of involvement by New York's two legislative bodies, the City Council and Board of Estimates. Subsequently, in July 1967, Hayes put together a revised proposal for a scaled-down "Institute for Urban Program Analysis." This proposal asked for a total grant of between $500,000 and $1 million and offered to recruit additional financing from local private sources that would support approximately one-fifth of the enterprise.[971] Lindsay and Hayes remained unwilling, however, to allow substantial involvement by the Democratic-controlled legislative bodies. As a result, the Ford Foundation rejected the revised proposal. In a letter to Hayes Winnick asked,

> Are we going backwards? The re-draft of the proposal fails to reflect our last discussion in which we agreed that the City Council and Board of Estimate would become participants in a 'city' proposal. As it stands it is still too much of a Mayor's agency.[972]

Lindsay also pursued, in vain, support for his plans from the federal government. On the surface, the technocratic bent of both the Johnson and Lindsay administrations, combined with Lindsay's progressive attitudes towards government activism, would seem to have offered ample grounds for cooperation between the Republican Lindsay and the Democratic Johnson. Indeed, Lindsay would later convert to Democratic party membership. However, the gulf between Johnson and Lindsay went far beyond partisan politics and was partly motivated by Johnson's suspicion that Lindsay and his own rival, Bobby Kennedy, were political allies.[973]

That Lindsay fancied himself a potential presidential candidate in 1968 further hardened Johnson's distaste. In May 1967, Lindsay appealed to U.S. Undersecretary of Housing and Urban Development Robert Wood for financial assistance of his efforts to "apply the tools of

systems analysis, mathematical programming and modeling, etc., to areas such as welfare and public works."[974] Wood quickly denied Lindsay's request, blaming research funding cutbacks.[975] A few months later, in October 1967, President Johnson was embarrassed by leaks to the press from his Special Advisory Commission on Civil Disorders, of which Mayor Lindsay was co-chairman. Johnson strongly suspected that Lindsay was the source of the leaks, and, in retaliation, Johnson had Joseph Califano look into ways in which federal housing grants to New York City could be postponed or delayed.[976]

Without direct support from either the Ford Foundation or the federal government Lindsay and Hayes decided to concentrate on attracting the involvement in New York City of the ultimate source of RAND-type analyses: the RAND Corporation. By the fall of 1967, RAND already had in place a small program of research for the Port of New York Authority and there had been tentative discussions between Lindsay officials and Rowen's team regarding RAND's assistance in implementing PPBS in New York. RAND's systems analysis work for the Port Authority originated during the summer of 1966 when RAND economist Burton Klein received a telephone call from Wes Hurley, a senior official at the authority, asking if RAND would be interested in studying the implications of very large air transports and supersonic aircraft on airports of the future.[977] Hurley believed that a revolution in the size and speed of both freight and passenger aircraft was on the horizon, and he wanted a systems analysis of the issues involved. Despite his civilian role at the Port Authority, Hurley's connections to RAND arose from his tenure as Chief Scientist of the Air Force's Air Research and Development Command and his close relationship with Trevor Gardner when Gardner was Assistant Secretary of the Air Force for Research and Development. Klein assured Hurley that RAND would be interested in the project, and by early 1967 had submitted a proposal for the study of New York's long-range airport situation that would involve some six to eight man years of research.[978] Work on the project began shortly afterwards.

RAND's direct relationship with the Lindsay administration began in late 1966, when Hayes initiated conversations with Rowen and his incoming management team about RAND's assistance in implementing PPBS in New York City. According to Hayes' later account of RAND's relationship with New York City,

> [RAND] was the most prestigious of the "think tanks" with a formidable reputation in economics and econometrics, and in quantitative analysis generally. Rand staff, notably Charles Hitch and David Novick, had in the 1950's done the pioneering work that led to the Federal Government's Planning-Programming-Budgeting System which we were attempting to install in New York. There was no organization in the United States better equipped than Rand to support our PPBS effort. Finally, it had in Harry Rowen leadership genuinely (rather than opportunistically) interested in the urban scene and in Peter Szanton, a program director of unusual ability and perception.[979]

Indeed, Peter L. Szanton was Hayes' key contact at RAND as the dialogue between New York and Santa Monica got underway. Szanton was, by training, a historian and lawyer who fit a familiar description—young, well-educated, with a defense management background. Szanton had been involved in policy analysis since 1962, when he joined the Policy Planning Staff for International Security Affairs in the Office of the Secretary of Defense where he worked with Henry Rowen on NATO policy matters. He served on that staff until 1963 when he became Deputy Director of the Program Evaluation Staff in the federal Bureau of the Budget—another missionary from the national security administration to the Great Society programs. In the BOB,

Szanton helped develop PPBS in a number of agencies of the federal government, and in 1967 he served as a staff member of the President's Task Force on Government Reorganization.

During his tenure at the Budget Bureau, Szanton had helped to develop a characteristic PPBS for police departments and had published an essay on this work in the Report of the President's Commission on Law Enforcement and Administration of Justice.[980] This essay attracted the attention of Peter Goldmark, one of Hayes' top aides in New York. Goldmark had been pursuing Lindsay's strategy of infiltrating policy analysts into the city administrations and, in 1967, he approached Szanton and asked him if he would be interested in becoming Deputy New York Police Commissioner for PPBS and related work. Szanton turned this down, instead accepting an offer to join Henry Rowen at RAND, where Szanton appeared to be a natural fit. Cool, aloof, and analytical, Szanton reflected Rowen's similar qualities and personified the RAND style and bearing. Despite foregoing the New York police job for RAND, Szanton maintained frequent communications with Goldmark and Hayes, and he played the key role in discussions leading up to the New York City-RAND partnership. When RAND opened its New York office in January 1968, Szanton became its director.

In the fall of 1967 and after the failure of Lindsay and Hayes' proposals to the Ford Foundation and the federal government, Hayes arranged to visit RAND's headquarters to discuss a formal partnership. For Rowen, Hayes's call offered a unique opportunity to salvage his plans for a meaningful urban research center at RAND after the Urban Institute had slipped out of his grasp. On one hand, John Lindsay was the mayor of America's largest and complex city. New York was the ideal laboratory in which RAND could gain first-hand knowledge of urban problems, experiment with ways to analyze these problems, and re-deploy systems analysis in social policy-making. On the other hand, Lindsay's frosty relations with the Johnson administration made him, perhaps, the only mayor of a sizable American city who was not entangled in Lyndon Johnson's pervasive political web.

As noted, the Johnson administration's announcement on 6 December 1967 that the Urban Institute would be established independent of RAND placed Henry Rowen's plans for diversification at RAND in jeopardy. While the Urban Institute would derive initial funding from the U.S. Department of Housing and Urban Development, Joseph Califano quickly used White House authority to pressure federal, state, and city officials to utilize the new institute for all domestic research needs. As Henry Rowen reported to RAND's board of trustees, "the immediate effect of the decision to create this Institute is to make more difficult the obtaining of general support from the Department of Housing and Urban Development."[981] Further, he reported, "We suspect that it will at least draw away some of The Ford Foundation money that might otherwise have been allocated to support of our efforts."[982] Rowen's carefully worded reports to his board probably did not express fully the depth of his disappointment at the turn of events. Thus, the opportunity to work in partnership with the Lindsay administration on New York City's urban problems must have seemed a small miracle to Rowen and his team at RAND.

The New York City-RAND Partnership in its First Year, 1968

Shaken by bloody rioting in cities like Los Angeles and Detroit and suffering the effects of "white flight", America's urban centers appeared to be tottering on the brink of social anarchy by 1967. In the first place, the gradual radicalization of the civil rights movement, exemplified by the displacement of older, more moderate leaders by younger, less patient proponents of "black power," had coincided with increasingly frequent incidents of racial violence. Years of patient struggle and apparent legislative victories had not translated into tangible gains for most African-Americans, and increasingly influential voices called for confrontation rather than cooperation.

Riots in many of America's largest cities flared with growing frequency, eliciting often brutal reactions from municipal authorities. At the same time, the anti-Vietnam War movement was gathering energy and launching ever larger, more raucous demonstrations. By the end of 1966, students had organized draft resistance and antiwar organizations on dozens of college campuses, and their aggressive protest campaigns were brought into the homes of nearly all Americans by the television media. Particularly stunning were images like those of Harvard University students surrounding Secretary of Defense McNamara's car and pounding on its roof when McNamara visited that normally placid campus. Against an urban backdrop of accumulating pollution, structural decay, inadequate housing, and widespread poverty, the social changes of the late 1960s impressed upon many observers that America was coming apart at the seams.

It was within this context that Hayes journeyed to Santa Monica in late 1967 to discuss a partnership between RAND and the Lindsay Administration that would apply RAND's systems analysis techniques to the city's nearly overwhelming problems. Hayes and Rowen quickly came to a handshake agreement, and at a City Hall press conference on 8 January 1968, Mayor Lindsay and Henry Rowen jointly announced the creation of a research partnership between the city and RAND. According to Lindsay, RAND's task would be to "assist [the] introduction into city agencies of the kind of streamlined, modern management thinking that Robert McNamara applied in the Pentagon with such success during the past seven years."[983] Within a year and a half, this partnership would be institutionalized with the incorporation of the New York City-RAND Institute, an autonomous organization supported jointly by RAND, New York City, and the Ford Foundation. Through 1971, the New York City-RAND Institute was the source of almost half of RAND's domestic social research efforts and, despite considerable problems, became the cornerstone of the corporation's diversification into social welfare research.

At their City Hall news conference, Lindsay and Rowen announced the signing of four contracts worth a total of $607,000, for six-month studies of the New York Police Department, the Fire Department, the Housing and Development Administration, and the Health Services Administration.[984] The language of the contracts was broad and did little more than outline the programs of research that RAND would pursue during this initial period. Coordinating the relationship between the city and RAND would be Lindsay's Budget Director Hayes, and the newly appointed head of RAND's New York Office, Peter Szanton. Clearly, the Bureau of the Budget would be RAND's champion—for better or worse—throughout the corporation's experience in New York City.

The contract work statements signed by Mayor Lindsay and Henry Rowen at City Hall were very brief, but they offered the following outlines for RAND's intended avenues of work:[985]

> Fire. The development of a programming-planning-budgeting system (PPBS); development of a predictive tool for estimating the number and type of fire incidences; the measurement of the effectiveness and efficiency of fire department operations; communications systems analysis; application of new technological developments to fire department operations; and work on departmental data systems.
>
> Police. The development of PPBS; measuring the effectiveness of police activities; exploration into alternative levels and types of future enforcement services; analysis of police recruitment, selection, and training; and police communications systems analysis and design.
>
> Housing. The development of PPBS; analysis of unit costs and benefits of the many city housing assistance programs; systematic study of undermaintenance and abandonment of privately owned rental properties including effects of rent control; development of long-range

housing strategies and a general model of the markets for existing housing and for new construction in New York City.

Health Services. Analysis of major resources allocation decisions to be made in the proposed 1968-1969 expense budget; development of measures of output and effectiveness for use in connection with PPBS; design of a long-term research program in health; determination of ways to control costs and performance of suppliers of health care; improvements of the delivery of community-based comprehensive psychiatric and psychological care to mentally ill patients; defining and conducting studies in other important policy areas such as reducing the in-patient burden, restructuring the administration of the health services delivery system, and improving the accessibility of ambulatory care.

The first task confronting Szanton and Hayes was to define with precision the research agenda RAND would undertake in New York City. Szanton immediately was bombarded with suggestions from the RAND staff for prospective research projects, the most ambitious of which came from RAND's war gaming and simulation guru, Ed Paxson. Paxson suggested that RAND construct and operate a "total model" of the New York urban environment.[986] He argued that the corpus of urban problems—crime, health, housing, pollution, transportation, taxation, civil unrest, relations with the greater urban area, economic viability, etc.—were closely interrelated. While systems analyses at the component level might produce marginally improved solutions to the individual problems, he argued that such piecemeal treatment of the city's problems could not guarantee that total funds would be allocated most efficiently. Moreover, by executing "disjointed incremental studies," RAND's analysts risked masking the significant effects of one component on all of the others. Thus, Paxson suggested that a team of RAND's New York staff be concerned from the beginning with the preparation of an aggregated total model of the city. He went on to detail his thoughts:

> Such a model would be a computer simulation. . . . The model can be operated not only by analysts but also by the Mayor and department heads themselves. They can propose new ordinances or procedures and see the overall effects unfold over time. The model can be cross-checked against past history and, of course, would be continually revised. . . . As a fanciful terminal footnote, I can imagine the ice rink at Radio City or the color mural in Grand Central replaced by a computer driven display model of the City, operating in its mathematical future under accelerated time. The political and touristic fruits should be considerable.[987]

No response to Paxson's suggestion could be located in RAND's archives, and it appears that Paxson's idea drifted to a peaceful and merciful death. Nevertheless, RAND's military research in Vietnam *had* included significant research on a range of urban problems in Saigon, which might serve as a basis for work in New York. In Vietnam, RAND analysts studying foreign aid problems and counterinsurgency issues recognized that the entire complex of urban problems—economic, social welfare, and political—had direct bearing on political stability, and could be translated to domestic research.

From the Lindsay administration's standpoint, Hayes wanted to initiate research programs in those agencies where he had strong relationships with the top administrators and, secondarily, where the nature of agency problems seemed to lend themselves to RAND's analytical solutions. According to Hayes, Howard Blum, the Health Administrator, and Jay Nathan, the Housing Administrator, were allies who readily accepted RAND research programs. Peter Goldmark

worked out the police contract with Commissioner Howard Leary, but Mitchell Ginsberg, the Human Resources Administrator, was utterly against any intrusions by RAND.[988] Thus, the initial four agencies—police, fire, housing, health—were selected according to these criteria.

The most obvious area where RAND analysts could be put to work immediately in each of these agencies was in the implementation of Lindsay's PPBS. By the time of the New York City-RAND partnership, the Lindsay administration already had been instituting and refining PPBS in its major operating agencies. These systems required that each year, in preparing their budgets, departments state their objectives, identify alternative programs for meeting these objectives, and then support their program recommendations with heavily quantitative cost-effectiveness analyses. An immediate component of RAND's New York City program was to assist client agencies in one or more of the core phases of PPBS operation: design of a program structure; specification of objectives; identification of costs in terms of the major purposes the agency was attempting to achieve; establishment of planning and budgeting procedures; design of information requirements; and analysis of the likely effects of alternative policies. This work was a direct application of skills learned by RAND staff members in assisting the implementation of PPBS first in the U.S. Department of Defense and then in the federal social welfare agencies. While such work made an immediate contribution to the Lindsay administration's policy goals, it was mundane and regarded at RAND largely as a necessary evil that would open the door to more innovative and productive research opportunities in the agencies.

By the end of RAND's initial six-month contracts with the four New York administrations, the relationship had produced little beyond RAND's assistance with PPBS implementation. However, both Lindsay and Rowen had made a long-term commitment to the partnership, and the RAND staff members could point out that it took RAND four or five years to begin producing consistently useful research for the Air Force. Thus, when the first contracts expired with the city's fiscal year (FY) on 30 June 1968, the city renewed them for a full year at double the initial annual rate and added a contract for a fifth agency, the Economic Development Administration, for a study of economic development and welfare patterns. By the end of 1968, a more clearly defined menu of research projects had been initiated by the RAND analysts working on New York's urban problems.

Creation of the New York City-RAND Institute, 1969

In April 1969, creation of the New York City-RAND Institute (NYCRI) cemented the partnership between New York City, and particularly its mayor, and the RAND Corporation. Until then, RAND had operated an office in New York, but the principal locus of New York research remained in Santa Monica. NYCRI was a new nonprofit corporation formed, in effect, as a joint venture by the city and RAND. The mayor of New York and RAND's president each designated half of the members of NYCRI's board of trustees. RAND management assigned research staff members to the Institute, as required, and RAND's president designated the Institute's president with the approval of the mayor. This structure reinforced the close association between Mayor Lindsay and RAND research efforts in New York, once again tarnishing the apparent objectivity of RAND's policy recommendations.

The reasons for creating NYCRI differed considerably for RAND and the Lindsay administration. From the inception of the New York research program, Szanton and Rowen had discussed ways of making permanent RAND's commitment to urban research. Rowen's numerous proposals for institutes committed to urban and social problems reflect this strategy. In particular, the lack of a permanent organization in New York made it difficult for RAND to separate its program of research for the city from the corporation's relations with the Lindsay

administration. Such dependence on one political figure had the further effect of limiting RAND's success in attracting foundation and private funding support for the New York research efforts. For Mayor Lindsay and his advisors, the institute's genesis had as much to do with their political needs as with research imperatives.

While paying lip service to the "permanence and independence" afforded by independent, nonprofit status, Lindsay and Hayes were equally motivated by the political fruits that might be harvested through the creation of a research institute devoted to New York City's urban problems.[989] First, 1969 was a mayoral election year and, in Hayes' words, there was "no certainty that [Lindsay] would seek or that he could obtain reelection."[990] In fact, Lindsay's ongoing battles with city council, the civil service, and the municipal unions had drained much of the reformist fervor out of his administration. Lindsay's popularity had crested in the spring of 1968, when national press attention had focused favorably on his administration.[991] In the fall, however, a series of teachers' strikes closed the city's schools from opening day until November 19 amid intense and deeply-rooted racial strife. These teachers' strikes and Lindsay's ineptitude in resolving them eroded the mayor's popularity and recast his golden boy image into one of a bumbling and indecisive operator.

With Lindsay's popular support waning and an election less than a year away, the mayor's opponents stepped up their attacks on his administration, concentrating on his failure to achieve long-promised renewal of city government. Almost three years into his administration, welfare caseloads continued their explosion, the fire department appeared to be on the brink of collapse, housing stocks and infrastructure remained in decay, and Lindsay could no longer blame the lack of progress on the inaction of his predecessor. Lindsay had hired top urban experts from across the country, a strategy that had damaged civil service morale, and promised to introduce efficient management, but he had few results to show the public. As Morris comments, "the harsh, but just, public judgment was that [Lindsay] had not delivered."[992] The mayor and his staff needed decisive action to recapture the political initiative, and part of the solution was the creation of an "Institute for the Future of the City of New York."

By June 1968, Lindsay and his top advisors were discussing the creation of a "super-institute" that would combine all of the urban research projects under city funding, including RAND's, into one permanent organization.[993] As Hayes's assistant Peter Goldmark conveyed to Peter Szanton, RAND's role in this venture would be "as mid-wife, guide, tutor, source of prestige and resources for recruitment and staffing . . . ."[994] Goldmark suggested that the super-institute be established as "the equivalent of a corporate division of RAND, with its own officers and broad delegated professional and administrative authority" and with a local board of trustees. Crucially, Goldmark told Szanton that, "at the end of a finite term, which I now feel ought to be three years, the Institute will automatically become fully independent of RAND. . . ."[995] However, such a maneuver would largely denude RAND of its talent in social welfare research and disconnect the corporation from its richest supply of urban research funding. Goldmark recognized this and closed his message to Szanton with an unsubtle test of Szanton's loyalty to RAND: "I nominate as the first head of the Institute for the Future of New York City Peter Q. Szanton IV."

Szanton, however, refused to take the bait and held the position that the creation of an institute under such circumstances would not be in RAND's interest. He did inform Goldmark of Rowen's efforts to create "several RAND institutes—an Urban RAND, a National Security RAND, a Health RAND, etc.," suggesting that a New York City institute might be fit into this rubric.[996] Such RAND institutes would be independent in terms of program and direction and could have separate boards of trustees. At Goldmark's request, Szanton had gotten a "last minute reading" from Rowen on the creation of a RAND Urban Institute that would include the

New York research program. Szanton reported that Rowen approved of the idea, but that Rowen believed Ford Foundation support of the institute might be necessary to trigger the acceptance of RAND's board of trustees.[997]

Such a breakthrough with Ford was achieved just days later. On 19 September, Hayes and Goldmark had lunch with Mitchell Sviridoff, the vice president of the Ford Foundation's Division of National Affairs, to discuss resurrecting the foundation's support of an urban research institute in New York. Reversing their decision of a year earlier and "relaxing their previous requirements for some sort of embrace on participation from the Board of Estimate, Comptroller, City Council, etc.," the Ford Foundation agreed to provide funding once the institute was established. Ford's support for the institute, despite the institute's political weaknesses, was driven by the foundation's general desire to facilitate the transfer of "systems processes" from the U.S. defense and space programs to urban policymaking.[998]

Throwing their own wrench into the plans, however, the foundation suggested strongly that the institute it funded be a partnership between New York City and the Urban Institute, not RAND. The principal reason for this was that the foundation's president, McGeorge Bundy, had chaired the committee that organized the Urban Institute. As a result, while Ford offered support of Rowen's diversification of RAND into social welfare research, the foundation had tried to keep RAND clear of establishing a presence in urban research—the preserve of the Urban Institute. For example, in 1967 and 1968, Ford had twice denied Rowen's proposals for a five-year, $5 million grant to support an "Institute for the Study of the Issues of Society."[999] Both Hayes and Goldmark, however, were inclined not to change horses in mid-stream, and Hayes instructed Goldmark to delay contacting William Gorham, the president of the Urban Institute.[1000] In the end, the Ford Foundation was unwilling to force Lindsay to drop RAND with such a large research program and staff already engaged, and the foundation promised substantial support once the new institute was in place.[1001]

As mentioned above, Rowen and Szanton had long considered the establishment of a RAND institute for urban research to be a proper outcome of the corporation's initial work for the Lindsay administration. Over the next few months, RAND and New York City officials worked out the specifics for the creation of a new, independent institute. By December, the parties had reached agreement to create a non-profit corporation as a long-term joint venture under the following parameters:

1. The new nonprofit corporation would be a joint venture of RAND and the city of New York.
2. The joint venture would have a specific term, probably ten years.
3. Management would be shared, with each party appointing half of the trustees.
4. The city committed to provide the necessary financial support—but not a firm amount.
5. RAND would supply all needed personnel, and those staff members would remain RAND employees.
6. Institute personnel would have to be acceptable to the city.
7. Current RAND-New York City contracts would be transferred to the new institute.[1002]

Working within this framework, RAND and the Lindsay administration spent the early months of 1969 ironing out the legal arrangements necessary to create the New York City-RAND Institute.[1003] The parties reached agreement on final documentation in March 1969, and NYCRI formally incorporated in May.[1004]

Good news followed NYCRI's formation when in July 1969 the Ford Foundation followed through on its promise and announced a three-year grant totaling $900,000 to NYCRI—

$300,000 for year one, $400,000 for year two, and $200,000 for year three.[1005] In addition to helping assure continuity of RAND's existing research and analysis program in New York, the Ford grant was designed to help NYCRI "avoid capture" by client agencies or current administrations and provide financial support for innovative or politically sensitive research. By the end of 1969, then, NYCRI appeared to be firmly on track. On one hand, John Lindsay had won re-election as Mayor of New York as an independent candidate despite losing the Republican primary in June 1969. This seemed to assure at least four years of solid, stable support from the municipal government. As 1970 approached, NYCRI research involved approximately 85 professional staff and part-time consultants, or about 60 full-time equivalent analysts from a wide range of academic disciplines. The city of New York still provided most of NYCRI's funding, at an annual rate of about $2.5 million, but this support was supplemented by RAND-sponsored research funds, small amounts of federal support, and the three-year Ford Foundation grant of $900,000.

NYCRI's headquarters on Madison Avenue were closer to City Hall than Santa Monica but still clearly separate from both. More importantly, Szanton and his staff quickly achieved considerable autonomy from RAND management in California, largely running the institute's day-to-day operations without consultation with RAND's senior management. The institute's staff developed a program of research for the city based upon negotiations with the client agencies and Mayor Lindsay's office. Also, institute management, under the supervision of the board of trustees, allocated the Ford Foundation funds, and although new institute staff members became RAND employees, they were recruited by NYCRI management for service in New York almost without exception.

One area where NYCRI retained a crucial dependency on its parent was in financial operations. According to the memorandum of understanding between RAND and NYCRI regarding operating relations, RAND provided all of the institute's working capital requirements and assumed financial responsibility for the institute's leases.[1006] All payments received by the institute were transferred to RAND, and RAND was responsible for paying institute salaries and all other charges. Almost unwittingly, RAND had assumed liability for the institute's financial obligations in the unlikely event of disaster. There were few signs, as NYCRI entered 1970, that disaster loomed just around the bend.

NYCRI's Program of Research[1007]

Following the signing of RAND's initial contracts with the City of New York, RAND's commitment to policy research in New York grew rapidly both in terms of personnel and financial resources. Henry Rowen's plans for RAND's New York operations were ambitious. He reported to the RAND board of trustees in April 1968 that his goal was, "To develop in New York a group of 75-100 professionals focused solely on major urban problems, and backed by a roughly equivalent number of researchers in Santa Monica."[1008] Although New York staffing never reached these levels, averaging 28 persons per year over the first three years, the group of analysts recruited from within and outside of RAND to work on New York City research was large and distinctive in several key aspects. First, RAND's New York City professional staff tended to be young, with an average age of about 30, highly educated, but inexperienced.[1009] Over half of the professional staff in New York had Ph.D's and nearly all had earned at least a Master's degree. Ten of the first thirty professionals came to the New York project from Santa Monica, nine from universities, five from private industry (chiefly systems consulting firms), three from the federal government, two from local government (the Stockton, California, and New York City planning departments), and one from a hospital. Predominant among the varied

academic backgrounds of this staff were operations research, mathematics, economics, and various fields of engineering.

Unlike the RAND Corporation, where disciplinary departments and research projects created an interlocking matrix organization, the institute's structure contained only projects. However, staff members were RAND employees and technically members of one of RAND's disciplinary departments. NYCRI project leaders shared management responsibility for individual researchers with the department heads in Santa Monica. On a day-to-day basis, this organization presented few problems since Santa Monica management largely abdicated authority to the institute staff. However, these ties to RAND created a certain degree of awkwardness, especially in removing personnel, since each of the institute's projects leaders shared authority with the Santa Monica department heads in personnel matters.

Szanton's autonomy from RAND in running the New York project, allowed him to choose his own project leaders and staff, subject only to the routine approval of relevant department heads at RAND. Szanton and his project leaders also had freedom under their New York City contracts to work out specific areas of research and to conduct this research as they saw fit. The institute president, in turn, gave great flexibility and latitude to the individual research project leaders to work out their own research agendas. In line with RAND's culture of research independence, Szanton did not provide strong central direction to the overall research program, nor did he assert an overarching scheme of research priorities to which the various project leaders had to conform.

In methodological approach, NYCRI staff concentrated on applying RAND's systems analysis techniques to New York's policy issues. Systems analysis, as practiced at RAND, was an interdisciplinary policy analysis methodology incorporating sophisticated mathematical techniques to evaluate the relative merits of policy alternatives. Systems analysis began with the examination of the client agency's policy objectives and proceeded with the identification of alternative policies that might achieve those objectives. The RAND analysts then estimated the total costs of each alternative—both direct and indirect—and the prospective effectiveness of each policy alternative for achieving the objective. A systems analysis concluded by comparing and analyzing the alternatives to find the combination that offered the greatest effectiveness for given resources —in other words, the lowest ratio of costs to benefits. RAND's systems analysis methods relied heavily on the quantification of future costs and benefits. Because RAND's systems analyses concentrated on evaluating the relative performance of complex systems under future states, such analyses also made extensive use of modeling and simulation techniques employing mathematical decision analysis.

NYCRI's research on water pollution in the New York metropolitan area exemplifies both this modeling-intensiveness and the transfer of RAND's military research methods to domestic policy analysis. In this three-year program, project leader Jan Leendertse and his staff used a computerized mathematical model to study the flow of water, and thus the diffusion and dispersion of pollution, in Jamaica Bay and its estuaries. Specifically, the institute's model was designed to estimate how, at numerous points in Jamaica Bay, water quality would be affected by alternative waste treatment facilities, under varying tidal conditions, temperatures, and potential changes in the configuration of the bay. Since 1948, RAND had been engaged in environmental modeling within the context of research on nuclear fallout and weather modification. Its water pollution modeling work had begun under Air Force sponsorship with the goal of predicting the effects of nuclear explosions in shallow water. Leendertse began his career with RAND in 1961 in this field, working initially on a project in underwater missile movements, particularly the effects of wave propagation resulting from nuclear attack. When this project came to an end in 1967, Leendertse transferred these techniques, under Dutch government sponsorship, to the

modeling of coastal flooding and, in 1968, to the dynamic modeling of Jamaica Bay. Clearly, the modeling techniques developed at RAND to understand the effects of underwater nuclear explosions had direct and useful applications in understanding the environmental changes taking place in Jamaica Bay. Indeed, all of NYCRI's research projects made heavy use of systems modeling in their policy analyses. Despite this technical sophistication, however, the applicability of RAND's military analysis for social policymaking in New York was a matter of intense debate.

By September 1971, RAND and NYCRI had completed over one thousand studies for ten municipal agencies. The total value of this work plus research contracts running through June 1972 reached $8.5 million in New York City funds, $1.2 million in Ford Foundation funds, and over $1 million of RAND's corporate funds. In addition, NYCRI had secured about $275,000 in federal research funds—largely from the Department of Housing and Urban Development, the Law Enforcement Assistance Agency, and the National Science Foundation—which contributed to the research effort in New York. The following pages highlight some of NYCRI's central policy analysis efforts in New York City.

Fire Department

NYCRI's largest client in New York City was the Fire Department, a bureaucracy that oversaw the operations of 15,000 uniformed firemen and expended more than $300 million per year. The problems facing the Fire Department in the late 1960s centered on rapidly increasing volumes of fire alarms and the city's high percentage of false alarms. Between 1965 and 1969, fire alarm rates more than tripled, from 68,000 to more than 240,000 per year with nearly a third of the 1969 calls being false alarms.[1010] Responding to these critical issues, NYCRI's work for the Fire Department concentrated on response patterns and fire unit deployment.

From the beginning of NYCRI's effort, institute researchers, led by Edward Blum, worked closely and effectively with Fire Department personnel so as to minimize the perception of NYCRI as an "outsider." Indeed, very soon after initiating work with RAND the Fire Department instituted a special bureau manned by fire officers and civilian analysts—the Planning and Operations Research Bureau. This bureau worked closely with institute personnel in implementing NYCRI's fire models and performing long-range forecasting and planning. The cooperative environment thus established proved crucial to the eventual success of the fire project, and it helped ensure that NYCRI produced results that were both relevant to the department's needs and sensitive to its institutional concerns and requirements. The effective working relationship developed between NYCRI and the fire agency is evidenced by the fact that the Fire Department, alone among city agencies, defended NYCRI during the political battles of 1971.

NYCRI's work with the Fire Department concentrated on the development and use of computer models that simulated New York's alarm experience and staffing needs. NYCRI's modeling efforts identified patterns in real and false alarms, and NYCRI analysts helped the Fire Department create staffing and response strategies that corresponded to these patterns. At NYCRI's recommendation, for example, the Fire Department altered its procedures such that only two engines and one ladder truck responded to each alarm. This replaced the traditional dispatching of three engines and two ladder trucks for each alarm—a response that was excessive for the preponderance of fires. NYCRI's fire analyses also contributed to the Fire Department's adoption of "adaptive response," a computer-aided command and control system which replaced preplanning with real-time decision-making in dispatch and response situations.[1011] In general, NYCRI's application of statistical techniques to Fire Department problems enhanced the efficiency of the force without infringing on the agency's bureaucratic prerogatives.

In addition, it was in its work with the Fire Department that NYCRI developed its most famous research product in the New York effort—slippery water (later known as rapid water). By a stroke of fortune, NYCRI's fire research leader, Edward Blum, was a chemical engineer who had consulted for Union Carbide Corporation during the 1960s. Union Carbide had toyed with the idea of selling a polymer product that, when added to water, allowed flow rates through hoses to be dramatically increased. In 1968, Blum persuaded New York fire chiefs to cooperate with Union Carbide on a research project exploring the usefulness of polymer additives to increase fire-fighting effectiveness. After some initial difficulties, three fire companies were equipped to test slippery water under live fire conditions, and the results were spectacular. By reducing the friction of water passing through the fire hoses, polymer additives increased by fifty to seventy percent the amount of water discharged without any increase in pumping pressure. This meant that smaller, lighter and more maneuverable hoses could be used by the fire companies. By 1976, the city had equipped eighty-one engine companies with slippery water, allowing those companies to be manned by four rather than five firemen, and thereby saving the department approximately $10 million annually.[1012]

Police Department

In contrast with the Fire Department research, NYCRI's relations with New York's Police Department were almost immediately problematic. NYCRI's contract with the Police Department was the largest of the four 1968 research agreements, totaling $965,000 through 30 June 1969, but the contract was canceled "in mid stream" by the department. These problems emerged principally from two sources: the police project's initial leadership and the political rivalry between Mayor Lindsay and Police Commissioner Howard R. Leary. In the former case, NYCRI's first police project leader, Sorrell Wildhorn, refused to station any of his researchers at police headquarters or in precinct houses and was perceived by the police as insensitive to their problems. Unlike NYCRI's experience with the Fire Department, NYCRI's research management failed to create a cooperative working relationship with the police, and no top-level Police Department official was assigned to serve as liaison between NYCRI and the department. While Wildhorn was quickly sacked, relations between the institute and the department had gotten off on the wrong foot. Work on police department issues continued after this early contract cancellation, however, under funding from the Ford Foundation and NYCRI's internal resources, and direct contract relations eventually were reestablished with the Police Department when Leary was replaced by reform Police Commissioner Patrick V. Murphy in 1971.

While the institute's police project leadership was relatively incapable, it may have been that no organization with ties to the Lindsay administration could have prosecuted effectively a program of policy analysis for the New York City Police Department. As Commissioner Murphy commented, "the relationship between City Hall and the New York Police Department under John Lindsay had taken a sharp turn for the worse from the very inception of the Lindsay administration in 1966."[1013] Within months of taking office, Lindsay had gone to the people with a referendum on the creation of a civilian review board that would examine citizens' complaints of police brutality and misconduct. The battle over the referendum was exceptionally intense, and the measure was defeated by nearly a two-to-one margin, due in large part to the organized opposition of the uniformed police officers. As Murphy observed, "the N.Y.P.D. had handed Lindsay . . . a perceptible political disaster" in his first year in office.[1014]

Contributing to the rapid deterioration of its relations with the Police Department, NYCRI's initial police research efforts concentrated on the exceptionally sensitive area of personnel policies, seeking to analyze police recruitment, selection, and training practices. NYCRI analysts immediately compiled a massive database containing personnel information on 1,915 officers who

had entered the force in 1957. This compilation included information on character investigation reports, appraisals of policemen's home situations, criminal records, employment histories, education, assignments, medical history, and data on criminal charges and civilian complaints.[1015] Obviously, such work placed extremely sensitive material into the hands of NYCRI's research team—a party that police officials increasingly perceived to be a threat. In later years, when NYCRI tried to rebuild its shattered relationship with the Police Department, analyst Joel Edelman recalled, "It was not our past technical competence that was really questioned, it was our goodwill and our goals that many police doubted."[1016] When an early NYCRI study of the police detective division infuriated the chief of detectives by what Frederick Hayes called, "the wholly factual finding that detectives solved a minute proportion of crime in New York," in June 1969 Commissioner Leary, having no enthusiasm for NYCRI, placed higher priority on internal peace and refused to renew the contract.[1017]

Continuing its police research under Ford Foundation sponsorship and with NYCRI corporate funds, the institute's police research team issued a highly controversial report on police misconduct in November 1970.[1018] This report drew upon the personnel database to argue in detail that the police were lax in handling official misconduct. It found, for example, that only five percent of the accusations charging policemen with committing a crime or abusing a citizen resulted in a punishment more severe than a reprimand.[1019] Of further detriment to NYCRI's relations with the city bureaucrats, the police misconduct report was issued directly to the press and made the front page of the New York Times on 20 November 1970. The report's release just shortly after Mayor Lindsay had appointed an investigative panel, the Knapp Commission, to investigate police corruption, heightened the perception that NYCRI functioned as a tool of the Lindsay administration. However, this report appealed to the needs of incoming Police Commissioner Patrick Murphy, who was charged with "cleaning up" the NYPD, and under Murphy's administration, NYCRI's work for the Police Department resumed.

NYCRI also developed several analytic models of police deployment, much like the work performed for the Fire Department. For example, NYCRI created a computer-based models which used queuing theory and other quantitative methods to allocate the department's patrol force among its precincts, distribute police officers across a given precinct at various times of day, and systematize the construction of duty charts. In later years, NYCRI analysts performed detailed studies of crime at the precinct level, using as a case study New York's 20th precinct, located on the west side of Manhattan. NYCRI researchers analyzed the demographic characteristics of the precinct in conjunction with crime patterns, the types of businesses located in the 20th, residents' typical daily patterns, and profiles of crime victims and perpetrators. This work yielded the first precinct-level crime policy analysis in the United States.[1020]

Housing Research

NYCRI's housing research for New York City was directed by Ira S. "Jack" Lowry, an economist who had been with RAND since 1963. At the outset, Lowry's team focused on constructing a PPB system for the Housing and Development Administration, and they compiled a weighty guide to the city government's housing activities—the first time such a comprehensive document had been put together. With input from Arthur Speigel, the city's liaison between the Housing and Development Administration and NYCRI, however, the top priority in NYCRI's housing agenda soon shifted to work on abandonment and rent control reform. As mentioned above, between 1965 and 1968, about 100,000 dwelling units had been abandoned within New York City. Many housing officials within the Lindsay administration linked this abandonment problem to the city's widespread rent control programs, and they urged NYCRI to investigate the implications of rent control.

In fact, NYCRI's most influential work in housing policy was on this problem. NYCRI's policy analysis of rent control centered on parallel studies of New York's housing markets and of its programs of housing assistance and regulation. Institute analysts found that rental revenues for much of the city's housing inventory were inadequate to support the long-term maintenance of the stock, a fact that led to widespread deterioration and abandonment. Furthermore, NYCRI staff members found that the city's bewildering tangle of regulatory and assistance programs often worked at cross-purposes and were ineffective in address this critical problem.[1021] In a series of reports, Lowry's housing research team argued that rent control programs eroded landlords' willingness to renovate properties and that rent control should be replaced by market-driven mechanisms such as rent subsidies and certificates. Under NYCRI plan, "non-welfare families would be issued rent certificates for the difference between what they could afford and the pre-established schedule of minimum rents. . . . Landlords would cash these certificates—similar to food stamps for grocers—with the city, which would redeem them only if the building were free of code violations."[1022] While NYCRI's policy recommendations did not come fully to fruition, the institute's research established definitively the direct relationship between rent control and housing quality.

Unfortunately for NYCRI, its housing research also embroiled the institute in intense political controversy. By 1969, rumors began circulating in New York that the Lindsay administration had commissioned several "secret" NYCRI studies that would make the case for drastic rent control changes. Housing and Development Administration officials denied the existence of such reports and engaged in a running battle with Democratic politicians over the issue. Sensing an opportunity to embarrass the mayor, ten city councilmen sued the Lindsay administration in early February 1970 seeking to force Lindsay's to release any housing reports. In response, the mayor's press secretary announced that no studies had been completed and that Mayor Lindsay remained adamantly opposed to modifications of rent control. On 13 February 1970, however, the New York Times ran on its front page the contents of a NYCRI housing study which criticized rent control, thereby severely damaging the credibility of the Lindsay administration. NYCRI reports played a central role in the ensuing political maelstrom, which is described in greater detail below.

Health Services Research

NYCRI research on New York's health services produced fewer immediate results that did the housing research, but it may have had the biggest long-term pay-off for RAND of any of its New York activities. In the short run, NYCRI's work with the New York Health Services Administration was marred by rapid turnover in its leadership. In mid-1968, RAND economist David McGarvey—who had worked largely in strategic weapons policy analysis until then—took responsibility for the New York City health policy research program, but he lasted only nine months before taking a position in Washington as a lobbyist for anti-ballistic missile systems. McGarvey was succeeded by Edward Forgotson, who remained in office for one year before stepping down. Forgotson was, in turn, replaced by Allen Ginsberg, an operations researcher who reported to the head of RAND's biomedical research program, Thomas Rockwell.

Thus, despite being NYCRI's second largest research program in total dollars consuming nearly $1.8 million over its first three years, the halting pattern of leadership hindered NYCRI's health policy research program, and no strong research concentration emerged as had occurred in fire and housing. Nevertheless, NYCRI health policy group performed influential research in such areas as lead poisoning, venereal disease, hospital bed utilization, and nurse training. For example, the institute's analysis of lead poisoning among children recommended stepped-up screening efforts, which quickly formed the basis of an expanded Health Department program.

As a direct result of this policy activation, the New York Health Department began uncovering over twice as many cases of lead poisoning as it had in the past. This resulted in substantial cost savings, in terms of reduced treatment required because the disease was detected earlier, and led to similar research in schistosomiasis, venereal disease, and alcoholism. In general, NYCRI's health research struggled to get off the ground, but the program did provide valuable experience for researchers who returned to Santa Monica. During this period, RAND began its long-term national health insurance experiment, which built on research started in New York City and remains a landmark effort in social policy research.

Welfare Research

By the early 1970s, welfare assistance had emerged as one of the city's most intractable problems, and one that threatened the New York's financial solvency. In 1973, seventeen percent of New York City's population, or 1.3 million persons, received welfare payments. This reflected a vast increase in welfare assistance over the previous decade, when, between 1963 and 1973, the city's welfare caseload more than tripled from 360,000 to 1,240,000. Over that same ten-year span, the magnitude of welfare payments had exploded, growing from $17 million in January 1963 to $107 million in January 1973. What was particularly baffling about these trends was that they had taken hold during a period of relative economic prosperity. Furthermore, city administrators had little idea of who made up the welfare ranks and why they did so.

NYCRI's program of welfare research was slow in getting off the ground, due mainly to resistance from the city's Human Resources Administration (HRA) head Mitchell Ginsberg. Ginsberg's strong reluctance to work with NYCRI, noted above, forced the institute to lodge its initial program of welfare research under its program for the city's Economic Development Administration (EDA).[1023] This severely limited the extent of NYCRI's welfare policy research during its first two years of operation. With regard to direct research for HRA, NYCRI's work before 1971 was limited to PPBS implementation and the training of HRA staff in that system.

NYCRI began a program of welfare research in earnest during 1971, using the institute's internal funds to support its first policy studies. In 1972, the city's HRA reacted to changes in state and federal welfare laws, in part, by asking NYCRI to construct a profile of welfare dependency. Under this research effort, NYCRI analysts identified the demographic characteristics of welfare recipients, compared the characteristics of the welfare poor with the non-welfare consuming poor, evaluated the effectiveness of job training programs, and provided city policymakers with their first comprehensive picture of the welfare system.[1024] NYCRI welfare research also included studies of municipal job creation, the equity of the city's shelter allowance policies, construction of welfare caseload databases and computer analysis programs, and a comprehensive review of New York City's Medicaid programs. In the case of the Medicaid research, NYCRI analysts compared the hospital use rates for two Medicaid groups: those covered by the prepaid Health Insurance Plan of Greater New York (HIP) and those covered by the normal fee-for-service provisions of Medicaid. This work provided further foundation for RAND's later national health insurance experiment. Finally, NYCRI analysts designed and constructed several extensive models for the city's use in welfare policymaking, including a model to predict monthly welfare caseloads and another to estimate the effects of proposed welfare reform measures on New York's economic performance.

The Outcomes of RAND's Early Research Program in New York City

One of the outstanding characteristics of NYCRI's research organization was the youth and inexperience of its research staff. In part, this was the result of a conscious plan by RAND's

management to use New York City as a training ground for social welfare policy analysts. Within months of announcing its partnership with the Lindsay administration, Rowen had received feelers from a number of cities, including Boston, San Francisco, and Washington, D.C., regarding the creation of similar research relationships.[1025] Unfortunately for RAND, the corporation suffered from a desperate scarcity of analysts with experience in urban research, which forced Rowen to decline these invitations. However, these opportunities impressed upon him the potential size of the urban policy research market and encouraged him to train urban analysts as quickly as possible. The intentional use of New York City as a training ground for analysts is illustrated in Rowen's correspondence with RAND trustee T. Keith Glennan, in which Glennan wrote, "Overloading [the New York City] task groups with trainees should permit the development of cadres of men able to participate in and, in some instances, to undertake responsibilities for leadership on additional projects elsewhere."[1026] However, RAND's research results in New York suffered substantially from this strategy.

RAND's early research efforts in New York City were further hampered by considerable naïveté regarding the complexity of urban problems and their susceptibility to RAND's systems analysis techniques. Ed Paxson's suggestion that RAND construct a "total model" of the New York urban environment reflected the corporation's excessive optimism in the power of its analytical methods. Foremost, effective analysis of urban problems demanded vastly greater consideration of social and political factors, which were not easily quantified and fit into cost-benefit models. The scales quickly fell from the eyes of RAND staff members who began digging into New York's problems in 1968. In March 1969, for example, Douglas Scott, RAND's information director in New York, said,

> This has certainly been an education for the Rand Corporation. There were certain comfortable simplicities about research on defense. But not here. The complexity of the human element, the complexity of the fiscal and political element, the plain complexity of New York City, are something we haven't encountered before.[1027]

Perhaps the most painful lessons learned by RAND in New York City arose from the corporation's relative innocence regarding the rigors of local politics. Peter Szanton, in particular, was unprepared to cope with the baffling and vicious nature of New York City politics —a morass in which NYCRI quickly became mired. On one hand, Szanton pursued RAND's traditional strategy of maintaining a low profile and detached relations with client agencies. While some RAND managers saw danger in this situation and advocated more aggressive public relations efforts in New York, Rowen and Szanton believed that RAND's research would pay rich dividends to the city in terms of cost savings and efficiency and that these results would speak for themselves. RAND had, especially under Frank Collbohm's direction, displayed an aversion to public exposure and self-promotion. In the long run, Rowen and Szanton believed, Lindsay's opponents would recognize the value RAND research brought to city government in much the same way that RAND's detractors in the Air Force often became convinced that a little heresy was good for that military service.

Much to the frustration of RAND's leadership in Santa Monica, Szanton failed to build political connections outside of John Lindsay's court. His failure was due both to Szanton's concern to avoid offending his allies within the Lindsay administration and to Szanton's distaste for New York's political intrigues. Szanton's low-profile approach also prevented the formation of productive relations with New York's active press community. As a result, when newspapers printed the unreleased housing report or articles critical of the institute during the "war over the consultants," Szanton and institute officials were consigned to a reactive role. On 7 October

1970, for example, the New York Times published an article entitled, "Garelik Calls Rand Study of City's Police a Failure," that cast the institute' police research program in poor light.[1028] Having established no working relationship with the paper, Szanton could respond only with a three-page letter to the newspaper's editor, in which he claimed that of the article's sixteen assertions regarding the institute, "Eleven of them are wrong, garbled or mythical."[1029]

Another concern was the narrowness of the New York City research program, especially the predominance of operationally-oriented problem solving in the early research program. In part, the elevated proportion of operational projects was a necessary evil due to NYCRI's need to balance its own desire for broader, more creative research projects with the Lindsay administration's demands for immediate and relevant results. Lindsay faced re-election in 1969, and his victory was far from assured. As early as September 1968, Rowen expressed the significance of these related problems to RAND's board:

> Our New York City work is of a highly operational, task-related nature. While broad from the City's viewpoint, basic and background work is missing from this effort, and this lack is a serious one. Moreover, working under contracts with individual "superagencies," we are often unable to study city-wide problems that cut across the individual jurisdictions of health, housing, police, etc. Our New York City work, at least initially, has been strongly dependent on the presence of Mayor Lindsay and Budget Director Hayes.[1030]

Indeed, numerous obstacles stood in the way of Rowen's and Szanton's desires for conceptual breadth and intellectual creativity in the NYCRI research program.[1031] First, policy-making authority for the crucial areas of urban social welfare such as education, transportation, and housing was fragmented not only among municipal agencies, but among the city, state and federal governments. Furthermore, many research areas fell between the jurisdiction of these authorities, such as a proposed technological and cost-analysis study of the relations between air pollution policy and New York's economic development. RAND was finding it difficult to garner funding from specific city departments for "cross-cutting" research projects such as a consolidated city information system that would include extensive, disaggregated data pertaining to these departments. Finally, political sensitivity foreclosed city funding of many research topics considered crucial by Rowen, such as a policy-oriented study of New York City's municipal unions.

Another obstacle the NYCRI analysts immediately encountered was deep, often overt hostility from the city's civil servants. Whereas the top administration leadership at least acquiesced in Lindsay and Hayes' desire to have NYCRI perform analyses in their agencies, civil servants situated below the upper crust of management greeted NYCRI analysts with suspicion and obstinacy. Hayes later recalled that while the administrators and commissioners who sponsored the research had been persuaded to do so by Lindsay or Hayes himself, even they "were skeptical, dubious of NYCRI's capacity to make any significant practical contribution to their problems. The senior civil servants were, in most instances, hostile and threatened."[1032] This attitude was especially strong among unionized and uniformed civil servants who wondered why precious budget dollars were being expended on egghead advisors rather than additional productive employees.[1033] Unfortunately for NYCRI, the youthfulness and attitude of its New York researchers made it easy for civil servants to conflate the NYCRI people with Lindsay's detested underlings.

The political and structural conflicts between the NYCRI analysts and the city's civil servants were magnified by deep cultural differences as well. At its core, NYCRI was, like RAND, a research organization that recruited Ph.D. researchers from academia to work on military or

social welfare issues. As such, NYCRI's research staff was suffused with the institutional psychology of a research organization, not that of a consulting agency. Hayes recalled that "the first group of Rand researchers were almost neurotic about protecting the 'objectivity of research,' fearful that they were to be conned into research designed to support established positions."[1034] NYCRI researchers thus frequently adopted a detached attitude with regard to city bureaucrats, and, according to Hayes, "they displayed little inclination toward friendly, or even tactful, relations with the commissioners who were employing them." In line with RAND's research culture, the NYCRI researchers were motivated less by satisfying their city clients than by gaining recognition from their professional peer groups in universities or other research organizations. The cultural differences between NYCRI analysts and their clients, the hostility of the civil servants to NYCRI's intrusions, the immediate resistance of municipal unions to "efficiency studies," and the ready identification of the NYCRI staff members with Lindsay's Whiz Kids all served to cement NYCRI's dependence in New York City on Mayor John Lindsay.

RAND's Entanglement in Lindsay's Political Web

John Lindsay supported the formation of the NYCRI to create political advantage. Unfortunately for NYCRI, this meant that the institute was born into New York City politics as a "Lindsay organization," and that made it a target for most of the city's politicians. Lindsay seemed to set in stone NYCRI's political allegiance in April 1969 when, much to RAND's chagrin, he packed the institute's board of trustees with his cronies.[1035] Rowen and Szanton felt that it was imperative that the board include prominent Democrats and union leaders, for the same reasons the Ford Foundation had initially conditioned their financial support of Lindsay's research institute on the meaningful participation of city council and Lindsay's opponents. However, Lindsay remained determined to exclude his opponents.

Certainly the most painful lesson RAND learned from its involvement in New York City was that the professed scientific objectivity of systems analysis methods did not protect NYCRI from political entanglement in venomous partisan politics. To Rowen's and Szanton's horror, antipathy between Lindsay and his Democratic opponents concentrated, after 1969, on Lindsay's relationship with RAND and NYCRI's role in city policy-making. The first attack on NYCRI came in February 1970 when a group of New York councilmen filed a lawsuit against the city demanding release of a "secret RAND report" that they claimed recommended relaxation of New York's twenty-seven year-old rent control laws. Rumors concerning this report had been circulating since November 1969 when outgoing Housing and Development Administrator Jason Nathan disclosed to the press that NYCRI was working on a study of the city's 1.3 million rent-controlled apartments. For nearly three decades, New York's rent control had been a political hot potato. On one hand, landlords maintained that the laws lay at the root of the city's housing stock deterioration. However, rent control was immense popular among New York residents, and NYCRI's rumored attack on rent control was political dynamite.

In fact, NYCRI *was* working on such a study, although its existence was unknown even to the institute's board of trustees. After Nathan's disclosure in November 1969, Peter Szanton wrote to his board, "As you will have suspected, there is such a document," although at that point the work remained a draft paper rather than a formal report.[1036] Specifically, the paper was entitled "Rental Housing in New York City (Volume I)" and represented the first installment of what NYCRI intended as a series of housing reports for the Housing and Development Administration. The study in question, Szanton explained to his board, analyzed in considerable detail the rental housing crisis in New York City, noted the limitations of existing housing programs, reviewed various strategies for the improvement of the city's housing, and

recommended changes in the city's housing policy.[1037] These recommendations included changes in housing policies such that controlled rent levels would rise more nearly in line with maintenance costs, rent assistance to poor families, vigorous code housing code enforcement, expansion of the city's experimental program designed to take control of "problem" buildings, and assistance to community groups seeking to acquire rental housing for non-profit or cooperative involvement.

At the core of the uproar concerning NYCRI housing report was its closely controlled accessibility—circumstances which led to charges of secrecy and conspiracy from Lindsay's opponents. Indeed, the institute had always followed a policy of careful control of research results, even though these reports were funded from public coffers and sensitive only from a political standpoint. Peter Szanton justified this policy—a seeming vestige of RAND's national security culture—by arguing that the institute's contracts were with the city agencies, and it was up to those agencies to authorize public distribution of the work. However, it was clear that Lindsay and Hayes intended to control the flow of policy information emanating from NYCRI. Hayes later wrote, "I had no intention of permitting a premature public exposure of the work of Rand or the Institute. . . . The contracts all required the approval of the Director of the Budget for public release of any Rand report and, by the summer of 1970, only two such releases had been submitted and approved by me."[1038] Such overt control of what was clearly publicly-funded, and therefore public, information quickly came under the intense scrutiny of the press and Lindsay's opponents.

New York's rent control laws were due for renewal on 31 March 1970, and debate concerning reform of the laws gathered steam as the newly elected municipal government took office in January 1970. The Lindsay administration still refused to publish the NYCRI housing study, claiming that it was incomplete. However, on 5 February, ten councilmen, sensing an opportunity to embarrass Lindsay, filed suit against the mayor to force revelation of the "suppressed" report. The councilmen asserted their need to see the study in order to help them formulate new rent control legislation. On 13 February, the New York Times ran a front-page story of leaked contents of NYCRI study. Described in sensational terms by the Times as "stamped with such warnings as 'Confidential' and 'Sensitive Information'," public depictions of NYCRI report smacked of conspiracy and recalled RAND's sinister military pedigree.[1039] The councilmen who had sued the administration earlier in the week to see the study reacted angrily. Councilman Donald R. Manes, a Democrat from Queens, said, "I am the chairman of the Housing Committee and the Mayor's office has not seen fit to give me a copy of this report." In response to the councilmen's lawsuit, on 25 February, State Supreme Court Justice Bernard Nadel ordered the city to release the RAND report within five days.

Despite this controversy, the Lindsay administration made careful and effective political use of NYCRI's rent control recommendations. In particular, the mayor made ample use of NYCRI's "scientific" findings on the adverse effects of rent control to support his plans for relaxing rent control. Reference to such authoritative results permitted him to elevate the rent control debate from a partisan struggle between tenants and landlords to one dominated by analytical "facts." Armed with NYCRI's detailed analyses, Lindsay proposed and won enactment of the first meaningful roll-back in rent control in nearly three decades. For Szanton and NYCRI staff, however, this painful experience was just the beginning of protracted political entanglement.

A far more serious attack on NYCRI erupted in June 1970 when city comptroller Abraham Beame launched an assault on the Lindsay administration's allegedly profligate use of consultants. The Lindsay administration had vastly expanded the city's use of private consulting contracts, such as those with RAND and NYCRI, from $8 million in the last year of the Wagner administration to $75 million in 1969. Although the approximately $2.5 million of support awarded to NYCRI represented a small portion of this annual total, the fact that NYCRI

conducted top-level policy research made it the prime target in Beame's attack. Furthermore, Beame pointed out that Lindsay's consulting contracts were awarded without competitive bidding, a violation of the city charter. Far from being the harbingers of modern management, Lindsay's consultants, Beame charged, were little more than the mayor's publicly funded political army.[1040]

Although Beame's charges against Lindsay had strong political motivations, they were grounded in legitimate procedural issues regarding the consulting contracts. In the first place, the consulting contracts tended to be exceptionally vague in defining the work to be accomplished. In the case of NYCRI, vague contract deliverables was an intentional strategy designed to allow flexibility in the program of research. The institute's letter to the city's corporate counsel regarding the nature of its contracts argued that the city agencies' and the institute's perceptions of research priorities could be expected to change over time as the particular problems facing the city became more or less urgent. Thus, "A broad contractual scope of work was . . . designed in order to give us the flexibility we needed to be responsive to the agency's needs as these developed over time."[1041] This "trust us" attitude towards contract definition offered an easy target to the comptroller and city council, however.

Beame raised a more serious procedural objection to the Lindsay administration's extensive use of "letters of intent" in consulting relationships like that with NYCRI. Legal documents filed by Beame in the fall of 1970 illustrate the apparent impropriety of these arrangements, using as an example a contract with the private consulting firm McKinsey and Company.[1042] The contract in question was purportedly executed on 2 September 1970, and "awarded" to McKinsey two days later. However, the work provided for in the contract had been completed by 15 April 1970, several months prior to the execution of the September contract. In fact, McKinsey had performed its consulting services not pursuant to any contract, but pursuant to a so-called "letter of intent" that had been executed on 4 March 1969. This letter of intent provided for charges up to $100,000 for work that had never been put out for bid and that had not been approved by the city comptroller. Through this mechanism of letters of intent, the Lindsay administration effectively circumvented the city's contract control procedures and awarded its consulting and policy analysis work without bidding or approval of the mayor's opponents. Unfortunately for NYCRI, RAND's work for the city was performed almost exclusively under letters of intent.[1043]

In mid-September 1970, city comptroller Beame decided to force a legal showdown with Mayor Lindsay on the issue of the consultants' contracts. Contrary to Beame's assertions, the mayor insisted that it was within his prerogatives to engage consultants without prior approval of city council or the comptroller. Lindsay thus refused to alter his administration's contracting practices with regard to NYCRI or its other consulting contractors. To force a decisive confrontation, Beame announced that he was stopping payment on all consulting contracts awarded without competitive bidding unless they had been approved by the Board of Estimate, thus forcing a court test of the contracts' legality. Further, he would not register any consulting contracts after 16 September 1970 unless the contracts were likewise approved. Lindsay and McKinsey & Co. responded with suits against Beame, and a protracted legal battle got underway.

For NYCRI, Beame's action was potentially catastrophic. At that point, the city owed the institute over $700,000 for expenditures under registered contracts executed prior to July 1970. Furthermore, the institute had, by late October 1970, already incurred an additional $625,000 in costs on contracts that Beame refused to register. The institute was spending money at a rate of $190,000 per month, but Beame had strangled its incoming cash flow. Worse, the RAND Corporation itself stood behind the institute's liabilities and immediately began hemorrhaging cash to meet NYCRI's obligations. RAND counsel and trustee Ed Huddleson hustled to New York to meet with Beame and seek a compromise.[1044]

Huddleson discovered instantly that the NYCRI was in the jaws of political stalemate. Beame was unyielding; he refused to register or pay any NYCRI contracts that had not been approved by the Board of Estimate. At the same time, Mayor Lindsay would not submit the institute's contracts to the Board of Estimate because, the mayor's counsel advised, such action might set a precedent that could prejudice his case in the pending litigation against Beame. If Beame won his case against the mayor, NYCRI contracts would be illegal, but might still be paid if unanimously approved by the Board of Estimate. Resolution of the suit, however, was months if not years away, and neither NYCRI nor RAND could survive that long. By the end of 1970, the RAND Corporation had advanced NYCRI a total of $1.4 million to keep it afloat—virtually the entirety of RAND's working capital. At the same time, RAND had requested that the Ford Foundation accelerate its payments on the $900,000 grant, with the final payment coming in early 1971, about one and a half years ahead of the grant's scheduled terminal date.[1045]

The New York City-RAND Institute's Fight for Survival

Beame's prohibition on payments to NYCRI hit RAND at a particularly vulnerable time. Since 1965, the corporation had been in serious financial difficulty due largely to Congressionally-imposed fixed-dollar ceilings on defense research at RAND and other non-profit research organizations, cutbacks in Air Force funding, and the large investments of corporate funds used to get the social welfare research programs off the ground. By mid-1970, RAND was caught in a cash pinch between its shrinking national security funding and delays in the expected pay-off of diversification, and it had expended its available cash reserves and was now borrowing to satisfy its working capital needs.[1046] It was clear that the corporation could not long sustain NYCRI without assurance that the city contracts would be paid. Szanton estimated that even if New York operations were shuttered as quickly as possible, probably no sooner than 1 February 1971, the corporation would sustain a cash loss of about $1.6 million.[1047]

After Huddleson's meetings with Beame and other city officials, he reported to RAND's board of trustees that the situation in New York was "most serious."[1048] RAND's board took up the matter at its semi-annual meetings, held in November 1970, and determined that RAND could afford to operate the institute for no more than thirty days without firm assurances that RAND would be reimbursed for its costs. The board resolved that, in the absence of such assurances or additional funding, the institute would be closed on 15 January 1971.[1049] RAND's board chairman, Newton Minow, dispatched a telegram to Mayor Lindsay stating that due to recent events, "a large fraction of RAND's operating capital is now at risk. . . . The survival of the New York City-RAND Institute is thus in jeopardy."[1050] Minow requested an immediate appointment with the mayor to discuss the survival of the institute.

Minow's telegram resulted in a meeting with Mayor Lindsay and his top advisors on 23 November 1970.[1051] The RAND contingent asked Lindsay to consider some limited concession to the comptroller that would move the institute contracts towards eventual payment, and thus offer some comfort to RAND's board that reimbursement was likely. The mayor's response, however, was firmly negative. He continued to resist any compromise on the ground that augmentation of the comptroller's or the Board of Estimate's powers would undercut the authority of his own office. Even at the risk of immediate destruction of NYCRI, Mayor Lindsay refused to provide any alternative method of registering the institute's contracts or assuring RAND's repayment.

For the RAND and institute officials, their November meeting with Lindsay made it clear that the mayor would support NYCRI only when there was political advantage in doing so. Whereas Rowen had been willing to bet the corporation on his and Szanton's commitment to New York, Lindsay's commitment to the institute was revealed to be far more shallow. In fact, RAND's

board was just learning what Szanton and many of the institute's staff members already knew. Following the meeting with Lindsay, Minow gave Szanton his own ultimatum: find alternative funding for the institute by the end of the year or RAND would turn out the lights.

Given the immediacy of his need, Szanton had no choice but to approach the Ford Foundation for aid. By the end of December, the foundation notified Szanton that it would accelerate the final installment on the original $900,000 grant (some $335,000) and consider an additional grant if RAND was willing to take some additional share of the burden. Szanton passed this news to Rowen who considered extending further funds to NYCRI, but by then RAND already had approximately $1.5 million at risk, and the RAND trustees' patience with Rowen was wearing thin. In a conversation with J.R. Goldstein, Ed Huddleson warned that Rowen's offer "to spend another couple of hundred thousand dollars of Rand's money in the face of the last Rand Board resolution [limiting further support to thirty days] without talking to the Chairman of the Board," would likely cause the RAND president's firing.[1052] Rowen's hands were tied; RAND simply had no further resources to sink into New York City.

With this news, Szanton arranged a meeting on 8 January of RAND, city, and Ford officials to offer a counterproposal.[1053] NYCRI would scale back its research program by 25 percent, maintaining only work that was both operationally important to the city and of demonstrated intellectual importance. All other research would be terminated immediately, the institute research staff would be cut by at least a dozen while others would be transferred to other projects, and overhead expenses would be reduced sharply. If the city's payment of institute contracts remained unresolved and no new sources of support had been arranged by 1 May 1971, NYCRI would be closed. With these changes, Szanton argued that the institute could operate through the end of the fiscal year with an additional Ford grant of $340,000 and no further support from RAND. McGeorge Bundy, Ford's president and representative at the meeting, agreed to the plan, thereby granting NYCRI a four-month stay of execution.

Still, Szanton knew that four months was an almost impossibly short period in which to resolve the institute's massive problems. Immediate staffing cuts were supplemented by Szanton's discrete efforts to find situations in Santa Monica for the institute's most valuable analysts.[1054] Most importantly, Szanton and NYCRI project leaders undertook an energetic campaign to locate new sources of funding for the institute. By the end of February, they had contacted two state governments, several cities, and a large number of federal agencies. Despite these exertions, however, Szanton reported to his board that the institute could expect to receive no more than $500,000 in support for the following year from these sources. This would be a useful augmentation of New York City funds, but it would not justify the continued existence of the institute as a separate entity. Furthermore, Szanton had contacted a group of foundations and businesses but found that significant contributions from either source were unlikely.[1055]

In growing desperation and under severe pressure from RAND to find allies among Lindsay's opponents, Szanton moved to cut a deal with the mayor's enemies. In Huddleson's meeting with Comptroller Beame during the previous November, Beame had informed Huddleson that, with Beame's approval, NYCRI could be paid for its contracts through the procedure of "equitable claim." This was a procedure under which the comptroller could recommend to the city's Board of Estimate that a claim against the city, which in his view had no legal basis, was nonetheless equitably due and deserving of payment. Under equitable claim, the institute's contracts would be recognized as illegal, but paid nonetheless upon the recommendation of the comptroller and approval of the Board of Estimates. At the time, Huddleson worried that since equitable claim required the unanimous approval of the Board of Estimates and the mayor's acknowledgment that the contracts were illegal, "this procedure was [the] equivalent of trying to pass a camel through the eye of a needle."[1056]

By February 1971, however, the terrain was markedly different. First, Lindsay had already suffered preliminary legal setbacks in his battle with the comptroller, and was on his way to final judicial defeat in June 1971.[1057] Second, Szanton and Rowen were much less squeamish about dealing with Lindsay's opponents, even over the mayor's objections—the survival of the institute was at stake, and Lindsay had been exposed as unreliable. As such, Szanton arranged a meeting with Beame in late February to ask for the comptroller's support in initiating the process of equitable claim. Specifically, Szanton needed Beame to recommend the institute's contracts to the Board of Estimate and to use his influence to secure the approval of the board's membership. In exchange, the institute was willing to submit its claims for payment to the board as illegal contracts. According to Szanton's notes for the meeting, he pointed out to Beame that this strategy would secure for the comptroller "public certification of [the] illegality of [the] Mayor's current contracting procedure," and "give [the] BOE [a] role with respect to consultants."[1058] This was a deal Beame could not pass up.

Following his meeting with Beame and subsequent contacts with Mayor Lindsay's office, Szanton reported to Rowen, "The Comptroller agreed readily, the Mayor's Office more reluctantly."[1059] In part, Lindsay went along with the plan because city council had nearly completed legislation, which was assured of passage, requiring Board of Estimate approval prior to the registration of consulting contracts. Moreover, Lindsay's refusal of the Szanton-Beame deal would have forced the mayor to take responsibility for killing his own institute—an embarrassment even greater than admitting defeat concerning the technical legality of the consulting contracts.

Lindsay's consent to equitable claim virtually assured the short-term survival of NYCRI. Working in cooperation with the comptroller's office, the institute prepared the necessary documentation and, by late March, was well along in the procedures for equitable payment. Comptroller Beame recommended to the Board of Estimate at its April 22 meeting that NYCRI's costs for the work performed between 1 July 1970 and 28 February 1971—some $1. 3 million—be reimbursed. By September 1971, the RAND Corporation had been reimbursed fully for its expenditures under existing NYCRI contracts.

Still, NYCRI's brush with death had inflicted severe damage to the organization—damage that would not be reversed easily. First, morale had been dealt a crushing blow. Throughout the second half of 1970, the institute had been under constant attack from the press and Lindsay's political opponents. In November 1970, Szanton wrote a memorandum to NYCRI staff entitled "Interesting Times" that was intended to boost morale. With regard to the constant stream of criticism leveled at the institute, Szanton wrote, "Being troubled is reasonable, being depressed is not."[1060] Unfortunately, the institute had suffered high levels of professional staff turnover since its inception—45 percent in 1969 and 20 percent 1970—due, in part, to RAND's strategy of using the New York program as a training ground. Nevertheless, such elevated turnover rates had deleterious effects on research continuity and staff camaraderie. Worse, the institute's staff was slashed from sixty-one in December 1970 to forty-two a few months later, crippling morale and leaving the survivors alert for job opportunities elsewhere.[1061] Financially, this decrease in NYCRI's base for allocating overhead meant that a greater percentage of total research funds had to go into non-productive fixed costs, which proved to be a persistent problem.

Most ominous, however, was the announcement in April 1971 of Peter Szanton's resignation, effective in September. Szanton had been the driving force behind RAND's presence in New York from its earliest days, and his elevation to NYCRI's presidency while still in his thirties was an impressive accomplishment. By late 1970, however, the incessant attacks on NYCRI from what seemed to be every quarter had worn down Szanton's morale. With the survival of the institute uncertain at best, he confided in Henry Rowen his desire to return to

academia even if the situation in New York could be salvaged. From Rowen's perspective, Szanton's departure was not welcomed, but NYCRI's excessive dependence on the Lindsay administration—arguably caused by Szanton's close ties to the mayor's staff—was threatening to destroy the institute and cripple RAND. Rowen was under severe pressure from RAND's board of trustees to correct this imbalance, and he asked Gustave Shubert to take over the institute's presidency from Szanton.[1062] Shubert declined, however, and no one else at RAND was in a position to assume direction of the institute at such a critical hour. Under these circumstances, Szanton had agreed to remain in charge until the crisis was resolved, but he made clear his intention to depart by the beginning of the next academic year.

Having successfully resolved the institute's financial crisis in April, Szanton announced that he had accepted a fellowship at the Kennedy School of Government's Institute of Politics at Harvard University, beginning in September 1971. Laying out the institute's situation for Henry Rowen, Szanton painted a gloomy picture: "It may well be that in this setting no organization like ours can long survive. I have no wholly satisfying answer to that argument. . . ."[1063] Szanton remained at the institute throughout the summer as RAND sought in vain for his successor, but on 3 September he took his final leave.

Wolves at the Door: Abraham Beame is Elected Mayor of New York, 1973

Despite the successful resolution of NYCRI's financial crisis in 1971, the institute remained on shaky ground as it entered 1972. First, NYCRI's key champion within city government, Budget Director Hayes, had resigned in 1971. Even worse, Hayes' successor, Edward Hamilton, not only lacked Hayes' personal commitment to NYCRI, but his administrative style favored the decentralization of authority. Hayes' efforts to centralize governing authority within the Budget Bureau were in harmony with the RAND style of policy research and management, but the fit with Hamilton was more challenging. Not surprisingly, one of Hamilton's first moves as Budget Director was to terminate the implementation of PPBS in the city government.

Compounding the loss of Hayes as a champion, John Lindsay undertook a campaign for the U.S. presidency in mid-1971 and for much of the next year acted virtually as an absentee mayor. As a precursor to his run, Lindsay changed his official party affiliation from Republican to Democratic in April 1971, and formally announced his presidential candidacy in February 1972. As it turned out, Lindsay's candidacy in the race was brief. He made an encouraging showing in the Arizona delegate poll, but in the crucial Florida primary he could do no better than fifth. After an identical showing in Wisconsin several weeks later, Lindsay abruptly ended his candidacy, returned, severely wounded, to New York and announced that he would not seek a third term as mayor of New York. As Morris observes, "most New Yorkers placed the lion's share of the blame for their increasingly desperate straits squarely on Lindsay and his liberal theorizing."[1064] Indeed, the city's recurrent financial crises had taken an ominous turn for the worse in 1973 as economic recession began to hit the city hard, and Lindsay's fragile political coalition melted away.

In an attempt to cultivate support among the mayoral candidates remaining after Lindsay's withdrawal, in February 1973 NYCRI invited all the candidates in the race to visit the institute for individual briefings.[1065] While it is unclear how many of the candidates accepted this invitation, the campaign could hardly have developed less favorably for the institute. As the 1973 mayoral campaign gathered steam, Democratic candidate Abraham Beame continued to run against Lindsay despite the mayor's departure from the race. Beame was Lindsay's opposite in virtually every obvious way—his manner, speech, dress, appearance, background—and his appeal to the voters of New York was patently a rejection of all that Lindsay stood for including NYCRI.[1066]

In particular, Beame represented the civil service culture, whereas Lindsay embodied the aloof, management-consultant persona. Throughout the election campaign, Beame concentrated his attacks on Lindsay's use of "outside" consultants, especially NYCRI, to solve New York's problems rather than relying upon New York's civil service, which he portrayed as capable but neglected. While NYCRI consumed only a tiny portion of New York City's enormous $6.6 billion annual budget, its political significance was paramount.[1067] In August 1972, city council president Sanford Garelik made a statement that seemed to resonate throughout the 1973 election:

> I ask you, how are they going to [chase the hoods out of town]? Are they going to do it with policemen, or are they going to do it with studies? I would suggest that the million dollars that they spent on the consultant studies should be employed, or given to police officers who will make a career of trying to drive the hoods out of this town. If we are going to have any success in our Fire Department, I suggest that the money be given to firemen to put out fires, and not to Rand.[1068]

As the New York Times later observed, "the Rand matter is significant primarily because it is the stage for a real culture clash," and Abraham Beame was able to ride that clash to the mayor's office in 1973.[1069]

The Institute's Death in Slow Motion

Upon Peter Szanton's departure from NYCRI in September 1971, RAND was unable to recruit a permanent president for institute until the spring of 1972. The man RAND finally hired was Bernard Gifford, a twenty-nine year-old Ph.D. in biophysics who was spending the 1971-72 academic year at Harvard University's John F. Kennedy School of Government preparing to write a book on urban policy. An African-American, Gifford had grown up in Brooklyn's Bedford-Stuyvesant section and was active in numerous civic action groups. During graduate school, for example, Gifford had taken leave on three occasions to work with Saul Alinsky's community organization, FIGHT.[1070] While young and bright, however, Gifford lacked experience in both management and in New York City politics. The depressing events of the 1973 New York mayoral campaign, as well as tensions between the young institute president and RAND management in Santa Monica, quickly sapped Gifford's enthusiasm for the project. After only a year at the helm, he resigned to become Deputy Chancellor of the New York City Board of Education. The situation's urgency demanded that RAND immediately find a replacement for Gifford, and on 10 December 1973, the institute's board of trustees approved Gifford's succession by Robert A. Levine, RAND's Director of Urban Policy Analysis, effective that day.[1071]

Robert Levine's task upon assuming NYCRI presidency was Herculean. While Levine was deeply experienced in RAND's analytical methods and had been closely involved in the redeployment of those methods to social welfare policymaking, he had limited experience in New York City politics and no meaningful connections with the incoming Beame administration. Nevertheless, Levine needed somehow to establish working relations with an administration that was elected largely with a mandate to discharge the outside consultants and "limousine liberals" of the Lindsay era.

With almost no time to get situated in New York, Levine undertook near-desperate efforts to save the institute. First, Levine and his staff prepared and distributed a twenty-three page report detailing the research performed by the institute for the city since 1968 and providing cost-benefit analyses for the various projects. Levine's report argued that NYCRI research, "has brought

about changes in agency policies and practices that have already resulted in net savings for the City which have reached a rate of $14.1 million a year and could soon jump to a rate of $39.7 million a year—amounts which far exceed the City's average annual investment in the Institute of slightly more than $2 million."[1072] Next, Levine tried to use this report to cultivate relations among the new administrators of the incoming Beame administration. In this effort, however, Levine and NYCRI staff made little headway. The incoming agency heads were eager to reconstruct the Democratic network of patronage that Lindsay had worked to dismantle and reassert the primacy of the civil service in policymaking, and they were unwilling to commit to working relationships with NYCRI without a firm statement by Mayor Beame on the status of the institute. This placed the fate of NYCRI in the hands of its most ardent antagonist—Mayor Beame.

Recognizing the extremity of the situation, the Ford Foundation refused to discuss with NYCRI follow-up support to its FY 1974 grant unless the institute received a statement of support from Mayor Beame. Facing the loss of both city and Ford Foundation funding, the institute again confronted imminent closure, and the institute's board of trustees decided that, "it was time to precipitate a decision on the Institute's continuation."[1073] The board instructed Levine to bring all available resources, including those at RAND, to bear on Mayor Beame and convince him to support the institute. With these marching orders, Levine and Gustave Shubert conducted a full-court press on the Beame administration, the Ford Foundation, and the New York media over the next six weeks. According to a thirteen page log kept by Levine of top-level contacts between institute supporters and the Beame administration, constant pressure was applied to the new mayor and his chief lieutenants by a host of influential NYCRI partisans.[1074] RAND and institute trustees placed calls throughout the Beame administration, including calls to the mayor, as RAND and NYCRI marshaled an impressive array of political assets. In all, over 150 telephone calls and personal meetings were conducted between 2 May and 9 July 1974 as Levine and Shubert tried to save the institute. Furthermore, in a reversal of historic patterns, RAND and NYCRI officials also made use of media connections in the campaign to save the institute. Most importantly, RAND and institute contacts convinced the New York Times to run an editorial favorable to NYCRI, which chided Mayor Beame's short-sightedness in terminating NYCRI.[1075]

NYCRI's and RAND's pressure tactics paid off in early June when Mayor Beame and his Deputy Mayor, James Cavanagh, informed Levine and Shubert, unofficially, that they had decided to fund the institute, but only at a level considerably below NYCRI's 1974 budget level of $1.6 million. Finally, on 9 July, Deputy Mayor Cavanagh met with Levine and Shubert and announced that FY 1975 would be a "trial year" for NYCRI, and that $1 million was the maximum that the city could offer to the institute for that period. With assurances from Cavanagh that 1975 would, indeed, be a trial and not a termination period, Shubert and Levine accepted the offer. The Beame administration's 30 percent cut in funding for the institute would be crippling, but not catastrophic. With formal support from the mayor, albeit at a dramatically reduced level, Levine could approach the Ford Foundation for support that might make up some of the losses. Staff reductions were a certainty, but the institute had gained a year-long lease on life in which to seek non-city funding sources.

In fact, Cavanagh may have been disingenuous in assuring Shubert and Levine that FY 1975 was not a termination period. Many observers at the time felt that, in the long run, Beame would want to shed himself of an organization that the public associated so strongly with his predecessor. Conceivably, any policy successes emanating from the institute threatened to reflect favorably on Beame's opponents, not on the Beame administration. As Levine later wrote to Shubert, "It hurts them to have to endorse us."[1076] In a 14 July 1974 article entitled, "Re-Thinking New York's Think-Tank Philosophy," the New York Times reported that the Beame

administration likely would shift the city's policy analysis relations to other sources, especially the City University, and cut off NYCRI at the end of FY 1975.[1077] City councilman Edward Sadowsky, who was quoted in the Times article, captured succinctly NYCRI's dilemma when he said, "Rand was a Lindsay thing, and Beame wants a Beame thing."

Indeed, the Beame administration's lack of commitment quickly became apparent as institute officials struggled to engage city agencies in research contracts. While Beame had officially earmarked $1 million in policy research funds for NYCRI, specific agencies still had to be convinced to hire the institute and actually spend the allotted funds. By the institute's board meetings in November 1974, one-quarter of Beame's budget for NYCRI remained unspent, and no agencies could be found to expend the balance of $250,000 set aside for the institute. Not surprisingly, whereas top Lindsay aides had played a crucial role in convincing city administrators to use NYCRI, no such support was forthcoming from the Beame leadership. Without pressure from above, administrators had little incentive to invite potentially embarrassing forays into their agencies by institute analysts.

Unable to locate non-city funding sources, Levine pressed RAND president Donald Rice for shared-work arrangements between Santa Monica and the institute, and even proposed a "tax" on RAND's social welfare research contracts to support New York operations.[1078] Rice and Shubert, immediately denied Levine's requests, and Rice sent Levine a tersely worded memorandum reminding him that, "One of your basic responsibilities is to develop and implement a plan to seek new funding from other sources . . . that will permit the Institute to remain viable."[1079] Levine responded by offering to Rice and Shubert what he saw as the institute's available options: 1) remain in business as currently configured; 2) go out of business; 3) convert the institute into the New York Office of the RAND Corporation; 4) convert NYCRI into an independent institute; and, 5) absorption of NYCRI into the City University of New York (CUNY).[1080] While option 1, staying open as currently configured, remained Levine's preferred course, he confided that the only real alternatives appeared to be numbers 2, closure, and 3, a New York office of RAND. Of the remainder, Levine reported, "I cannot take any of the others very seriously."[1081]

A few days later, Levine received deeply disheartening news from former institute president Szanton. Szanton, now the Research Director for the Commission on the Organization of the Government for the Conduct of Foreign Policy, had "indirectly" come into possession of an internal Ford Foundation document reviewing Ford's program of support for NYCRI.[1082] The report found that the institute was undergoing a "painful" adjustment to lower levels of city funding and faced an uncertain future with the Beame administration. The Ford memorandum concluded that, "While the Institute hoped that the Foundation would pick up a bigger piece of the slack in its 1974-1975 budget, [Ford's Urban Management Division] staff felt that at this stage of the organization's development such extraordinary support cannot be justified. . . . UMD expects to support the Institute for one more year at a somewhat lower level. Beyond 1975, our involvement would end with the possible exception of support for specific projects."[1083] Thus, the institute's savior in past crises was stepping away from the table.

NYCRI's death knell was sounded in a meeting between RAND/NYCRI officials and Deputy Mayor Cavanagh on 28 February 1975. RAND's terms for continuing the institute were firmly set before the meeting: the city would have to commit to a minimum of $1.3 million per year for the next three years (with adjustments for inflation). If the city were willing to provide the institute with office space, RAND could accept $1.2 million, but the corporation was willing to go no lower.[1084] If Cavanagh refused to meet these minimum funding demands, RAND's board of trustees would move to close the institute.

After the RAND team opened the meeting by stating the institute's funding requirements, Cavanagh recited the city's financial plight and added that there had been considerable difficulty

"in locating projects" for the institute under its current funding.[1085] He then announced that he had budgeted $900,000 for the institute in FY 1976, but that he could not promise even that figure before the budget was approved—which might be as late as June. However, he assured the visitors that the $900,000 "offer" could not be increased. With neither side willing to budge, RAND trustee Frank Stanton concluded the meeting by expressing RAND's desire to withdraw from the institute barring changes in the administration's position. Subsequent to the meeting and as a last resort, Stanton sent a letter to Cavanagh affirming NYCRI's minimum requirement of $1.3 million per year and setting 12 March as a deadline after which RAND's board would terminate the institute.

By this time, however, Mayor Beame and Deputy Mayor Cavanagh were confronted with far larger problems than the survival of NYCRI—New York City was on the brink of insolvency. For a decade, the city had resorted to increasingly complex financial maneuvers and had taken on a vast burden of debt to remain viable.[1086] In the spring of 1975, however, the city's financial chickens came home to roost. During FY 1974, New York's current deficit—the excess of cash disbursements over cash receipts—had reached $2 billion, and a combination of rising real estate tax delinquencies, revenue shortfalls, depleted cash reserves, exploding pension obligations, and the capitalization of operating expenses was eating away the city's financial base. New York's total borrowing in the calendar year 1974 was in excess of $8 billion, and in November short-term debt outstanding was $5.3 billion—$1.9 billion over the amount outstanding in June and a fourfold increase in just four years. By early 1975, New York City accounted for over 40 percent of all short-term tax-exempt borrowing in the United States, and financial analysts were becoming frightened.[1087]

New York was obligated to redeem approximately $500 million in bonds and notes in March 1975 and another $600 million in April. Beame's budget officials calculated that the city's total cash needs through the June fiscal year-end would be more than $2 billion in excess of anticipated cash receipts, thus requiring borrowings of at least that amount. However, the city's legal borrowing authority fell about $900 million short of the amount the city needed to keep running. When the city proposed the sale of $550 million of short-term notes in early April to meet an approaching debt redemption, the city's bankers finally balked. By now, approximately 20 percent of the banks' equity consisted of city paper, and they could no longer afford to float issues for which they would be liable in the event of a city default. On 14 April 1975, the short-term credit markets finally closed to the city and would take no more New York debt. The city was broke. Over the next four years, New York stumbled from crisis to crisis, repeatedly escaping default on its debt through last-second state and federal bailouts. As a final insult, New York state's governor, Hugh Carey, used a new statute to assert control over New York City's municipal government and financial operations.

In the din of these cataclysmic events, it is likely that Mayor Beame paid little attention to a letter he received on 16 April from RAND's board chairman, J. Paul Austin. At RAND's April board meetings, Frank Stanton's committee had reviewed the events of the past two months and recommended that RAND dissolve NYCRI. Austin's letter to Beame reflected the board's acceptance of these recommendations, and informed the mayor that the institute would be dissolved effective 30 June 1975. The remaining assets and obligations of the institute would be assigned to and assumed by RAND, and all contracts with city agencies not completed as of 30 June would be completed by RAND.[1088] Austin's letter also named Marshall Davie, a RAND administrator, as the new vice president of NYCRI whose task it would be to oversee the institute's dissolution. While Davie's ascendance was not marked by public fanfare, an anonymous RAND wag wrote a mock press release announcing the new vice president's appointment:

> "A smooth transition from organized activity to unemployment must be achieved for all personnel," Shubert said upon announcing the decision. "The Board of Trustees was unanimous in their desire to entrust this awesome task to Marshall. He has proven himself well in battle, and we are confident that with the aid of the City, he will attain victory. The last obstacle to the achievement of total municipal inefficiency and chaos will have been removed successfully."
>
> Marshall came to Rand from DoD, thus [he is] highly experienced in the proliferation of waste and cost overruns—skills which are highly valued in the City's bureaucracy. At Rand, he has been involved with similar tasks.[1089]

Friday, 31 October 1975 was closing day for NYCRI offices at 545 Madison Avenue. By then virtually all of the institute's work had been completed and delivered to the client agencies, and further matters would be handled from Santa Monica. At that time, the city owed the institute approximately $310,000 for work performed under FY 1975 contracts, and the size of this balance due continued to impose a heavy strain on RAND's resources. Davie estimated that the resolution of various outstanding issues would eventually reduce this deficit to about $200,000, which was still a sizable chunk of the corporation's working capital. With the shuttering of NYCRI's offices, RAND thus brought to a close its landmark effort to forge a civilian systems analysis partnership similar to its long-standing Air Force relationship.

Conclusion

The RAND Corporation's research partnership with the city of New York was the cornerstone of its strategy to redeploy its military system analysis into the arena of social welfare policymaking. In many respects, it is difficult to construct a counterfactual strategy that Szanton and other NYCRI managers could have adopted that would have saved the institute from its eventual fate. RAND's difficulty in finding a replacement for Szanton in 1971-72 reflects widespread recognition that NYCRI was not a viable enterprise. Reflecting upon the course of events in New York City, Szanton argues that while he lacked the political capabilities that offered NYCRI its only chance of survival, "It was clear by 1971 that [the institute] was being tossed about by political currents that were much more powerful than it could deal with. . . . I don't think there was a win solution to this."[1090]

Strictly in terms of its research output and impact on New York City, NYCRI cannot be judged an unqualified success. In 1971, the Ford Foundation conducted an extensive evaluation of NYCRI and its research output and found the institute's production to be a mixed bag of results. Overall, the Ford evaluators found that "roughly one-third of the [NYCRI's] work was highly useful, one-third marginally so and one-third useless," and they assigned the institute a letter grade of "C"—a failing grade in graduate-level research—for its work in New York City.[1091] Given the distaste of several top Ford administrators for RAND's New York City activities, noted above, the harsh conclusions of the evaluation must be viewed with circumspection. Peter Szanton responded to the report with a letter to the Ford Foundation's Mitchell Sviridoff in which Szanton invoked a sports analogy: while a one-third success rate sounds quite poor when taken out of the difficult context of New York City politics, that same .333 batting average would be an exceptional performance in baseball.[1092]

In fact, RAND's New York adventure produced important favorable outcomes. First, several research projects, especially the fire and housing rent control programs, had powerful

impacts on New York's municipal policymaking. In a letter to city officials in May 1971, for example, institute management argued that New York's annual expenditure of just over $2 million in institute research had achieved savings of over $20 million per year.[1093] Furthermore, in fields such as health care and welfare, RAND's work in New York set the stage for larger projects like RAND's path breaking Health Insurance Experiment which were executed in Santa Monica and had national significance. Overall, the institute proved itself to be a prolific research organization that influenced urban policymaking throughout the United States. During the years of its operation, NYCRI remained the leading center for the application of systems analysis and "scientific" policy analysis to urban policymaking. Inspiring both widespread imitation and criticism, NYCRI provided a model for the plethora of policy institutes that followed in its footsteps.

For RAND, the New York City venture was a painful but invaluable step in the corporation's diversification process. On one hand, RAND's engagement in New York nearly bankrupted the corporation, contributed to the downfall of Henry Rowen from RAND's presidency, and was prematurely terminated after only six years of operation. On the other hand, NYCRI provided an invaluable training ground for both RAND researchers and RAND methods. Rowen and his staff knew that systems analysis and systems analysts required substantial retooling as they shifted from the military to the social welfare environment, and RAND's extensive commitment in New York provided an opportunity to achieve these goals. Despite NYCRI's eventual closure, RAND had cultivated in New York a large crop of analysts with experience in urban policy research, many of whom remain key figures in social policy analysis, both at RAND and elsewhere, in the late 1990s. With regard to methodologies, the extensive modeling performed on New York projects such as the water pollution and school desegregation studies gave RAND analysts rich opportunity to massage techniques developed in warfare analysis and apply them to non-military situations. Also, RAND's exposure in New York provided the corporation with a springboard into other municipal relationships.

Beyond simply tallying RAND's accomplishments and setbacks in New York, however, the history of NYCRI offers an opportunity to derive important lessons regarding the application of systems analysis to social welfare policymaking. First, RAND's New York experience suggested the limitations of systems analysis in social welfare policymaking. From the beginning, RAND's analysts focused their attention on problems that lent themselves to quantitative analysis, as was the case in NYCRI's fire deployment, housing, health, and corrections research projects. As Shubert commented, "You'll notice that virtually all of those [research areas] are amenable to traditional RAND quantitative analysis."[1094] Indeed, it was in those areas where mathematical modeling and quantitative analysis were most straightforward that the institute's work was most successful. Furthermore, RAND's New York experience indicated that the corporation faced a dilemma in its social welfare research strategy. RAND managers and researchers wanted to attack problems, as David Shepard described, "cutting across the boundaries of city agencies and state and federal jurisdictions." Yet, NYCRI work tended to have its greatest impact in projects that were narrowly focused and operationally-oriented by RAND standards. To a large degree, this was a function of the bounded responsibilities of NYCRI's client agencies. Writing in 1972, after his departure from the institute, Szanton concluded that urban research projects had to attack problems that were within the client's administrative purview to deal with in order to have any success.[1095] For example, Szanton cited NYCRI's work for the Economic Development Administration (EDA), in which the institute's analysis shifted rapidly from narrowly-defined issues to an examination of the demographic forces at work in New York and to the economics of the metropolitan labor market—thereby fulfilling David Shepard's aspirations for NYCRI research. While these were issues of fundamental importance to the mission of EDA (and of

fundamental interest to NYCRI researchers), they were far beyond the policy capabilities of either that agency or the city government. As such, this research "generated little interest and . . . [had] no impact on policy."[1096]

NYCRI's history offers concrete evidence of the enormous complexity of social welfare policy analysis. The relative complexity of social welfare issues in comparison with defense policy matters was recognized, theoretically at least, by RAND officials well before the New York programs got underway. Still, the vast complexity of New York's social problems came as a rude shock to many of the RAND analysts who tried to engage them. Publicly, RAND and institute researchers continued to expound upon the suitability of systems analysis for such policy matters as well as the objectivity of analytical outcomes. RAND's 1970 booklet, Policy Analysis in Action: RAND's Work on the Problems of Modern Society, argued that RAND's methods provided "rational, objective analysis" for social problems "characterized by conflicting objectives, competing alternatives, and uncertainty as to future developments."[1097] However, some experienced researchers questioned the use of systems analysis in policy matters where quantification was difficult and unreliable. For example, on the occasion of his 1972 retirement, twenty-four year RAND veteran Herbert Goldhamer advised RAND's trustees and management:

> There is a tendency today for available analytic techniques to dominate attempts to solve problems in which a lot more is involved than can readily be dealt with by these techniques. Rand deals with a substantial number of problems that have components not readily subject to calculation in a way or to a degree that we prefer. Some problems require a large amount of judgment. [That judgment] is likely, however, to rest on a great many diverse inputs often difficult to manipulate in a manner that permits explicit and reproducible calculations.[1098]

While no RAND analysts advocated the abandonment of systems analysis in social policy matters, the New York experience demonstrated that RAND's methodologies had important limitations.

Central among these limitations was RAND's inability to handle New York's political complexity. RAND's defense-bred management techniques did not translate well to the decentralized environment of city government. In the end, John Lindsay was utterly unable to employ RAND's management methods, especially PPBS, to centralize authority as Robert McNamara had done in the Pentagon. Like McNamara, Lindsay brought into his administration a cadre of highly-educated management experts and tried to implement PPBS so as to centralize control of the city's vast bureaucracy. However, unlike the hierarchically structured Department of Defense, New York City is a vibrant and open democracy in which political power is diffuse and political participation is widespread. As Szanton remarked, "There is remarkably little of importance, in short, that the executive branch of the City government, having decided that it should be done, can count on being able to do."[1099] For RAND's analysts, who were accustomed to working with clients whose ability to implement policy recommendations was comparatively unobstructed, such an environment was deeply frustrating.

Often, this frustration caused NYCRI officials and analysts to blame partisan politics for their difficulties when deeper issues were at work. During the "war over the consultants" in 1971, for example, NYCRI fire project leader Edward Blum wrote, "The whole rationale for the fuss is political, strictly a political attack on the Mayor, and should be treated as such!! It will be dangerous to assume that the [Sadowsky] Subcommittee is rationally seeking to be informed; that isn't what it has in mind."[1100] However, while partisan rivalry played an important role in this controversy, city councilmen were also focused on a fundamental issue: the potentially corrosive effects of "secret" consulting efforts on the city's democratic processes.

Mayor Lindsay's strategy of employing consultants, such as NYCRI, to replace public discourse with expert analysis was designed to circumvent the city's normal democratic processes. NYCRI's public relations specialist, Douglas Scott, attended the council proceedings throughout the "war over the consultants" and recognized the importance of this issue. In an "eyes only" memorandum to Peter Szanton, Scott reported that, "[Council President Sanford] Garelik, at his most sincere at this point, called for a checks and balances, that which made the Civil Service so important, and made a rather persuasive case that consultants are falling outside the Civil Service System and therefore constitute a danger to the entire democratic process. This is an issue, I repeat, which must be confronted."[1101] Several months later, the writers of the Ford Foundation's NYCRI evaluation emphasized the gravity of this matter when they asked,

> [D]idn't the Council and members of the public have a legitimate right to analyze for themselves, in the same detail available to the executive, the research which formed the basis for the Mayor's [rent control] recommendations? Over one million dollars in city tax funds went for this research. Didn't the Mayor have an obligation to the Council and public to share the results with them?[1102]

At issue in New York City were questions of public accountability and open discourse concerning key government policies—not simply partisan squabbles between John Lindsay and his political rivals.

Another methodological limitation that lay at the core of RAND's considerable difficulties in New York City was the purported "objectivity" of systems analysis. On one hand, the complexity of RAND's analyses seemed to quash public debate over critical issues by elevating the terms of discourse to a level unintelligible to common citizens. On the other hand, RAND and Lindsay administration officials repeatedly assured the public that while complex, these analyses bore the rationality and objectivity of modern scientific methods. Indeed, the apparent methodological rigor of the analyses seemed to provide evidence of their unbiased reliability. In a 1974 New York Times article, for example, Robert Levine asserted, "What we've been able to develop at Rand is something independent that doesn't have an axe to grind in its approach to new problems."[1103]

However, the New York public never bought into the scientific objectivity of RAND's policy analyses. While Lindsay and his staff asked New Yorkers to place their faith in the technical proficiency of modern management methods, RAND's efforts in the city were consistently met with widespread public suspicion. Indeed, RAND researchers recognized that systems analysis could be manipulated with little difficulty by trained and astute analysts, and many observers noticed that NYCRI's policy analyses consistently provided "scientific" support to Lindsay administration policy initiatives. The institute's rent control and police misconduct findings, cited above, exemplify this pattern, and the public debate over the fire deployment analyses illustrates how subjective mathematical policy analysis could be.

As RAND's New York fire service research was getting underway in 1968-69, fire company workloads were a key issue in contract negotiations between the city and the firefighters' unions. The mushrooming alarm rates of the late 1960s had placed severe demands on fire companies located in high incidence areas, and the unions demanded that the city add new, full-time units to these areas. However, the city already had added one new company in 1967 and nine in 1968, at a cost of approximately $600,000 per year for each unit.[1104] Instead of adding more new companies, the Lindsay administration wanted to reduce the number of units initially dispatched to fire alarms from the traditional three engine companies and two ladder companies—thereby reducing unit workloads—and assign any new companies to work only during peak fire incidence

hours rather than around the clock. At the time of these negotiations, NYCRI fire team had been working for about eighteen months and were developing firehouse location and deployment models, as well as a computer simulation of fire deployment operations. In light of the contract negotiations, the institute fire analysts pushed ahead with their models and prepared evaluations of various deployment alternatives. Within a few months, they had prepared extensively documented policy analyses which recommended that, "reducing nominal response and adding companies at peak hours would improve fire protection and reduce workload."[1105] Not surprisingly to the union negotiators, NYCRI analyses were consistent with the Lindsay administration's bargaining positions.

Perhaps having learned a lesson in these negotiations, the firefighters' unions armed themselves with their own "scientific" policy analyses in subsequent negotiations. Of particular interest for present purposes are analyses performed by Rodrick and Deborah Wallace during the 1970s which employed systems analysis methods to refute NYCRI's fire research findings. The Wallaces, both Ph.D.s and the director and president, respectively, of Public Interest Scientific Consulting Service, Inc., published their findings almost simultaneously with the RAND fire deployment analysis book in 1979. Whereas the RAND analyses demonstrated that fire service could be improved as manpower was reduced, the Wallaces proved the opposite—that "a precipitate decline in the quality of [fire] service took place when [service personnel] cuts were made."[1106]

If nothing else, the Wallace critique underscores the debatable scientific objectivity of RAND's systems analysis methods. RAND's fire deployment studies gained the acclaim of policy analysis professionals, with two NYCRI analysts, Peter J. Kolesar and Warren E. Walker, winning the Operations Research Society of America's prestigious Lanchester Prize for their work in this field.[1107] Yet, working with largely the same data, mathematical rigor, and methodological expertise, but with contrasting policy biases, the Wallaces' reached conclusions opposite those of the RAND fire analysts. Whereas NYCRI researchers argued that efficient redeployment based on their models had enhanced service levels and reduced personnel costs, the Wallaces concluded that, "The accelerating collapse of fire service in New York City has all the characteristics of a major ecological disaster. The only apparent solution is the reopening of fire companies . . . and a return to adequate manning."[1108]

Consistent with a theme that has recurred throughout this book, RAND's systems analysis methods proved to be politically powerful in social policymaking despite their questionable scientific objectivity. In fact, NYCRI became a favorite target of city councilmen precisely because the institute's analyses were politically highly effective. RAND's systems analyses employed advanced mathematical methods, extensive and complicated modeling and simulation techniques, and mountains of raw and parsed data, and citizens who lacked advanced degrees, including most elected officials, could hardly understand such analyses, let alone refute them. Meanwhile, Lindsay's agency heads wielded NYCRI reports like blunt instruments, confounding their opposition like Robert McNamara and his lieutenants had done at the Department of Defense in the early 1960s. For example, Jon Weiner, a health program analyst in Lindsay's Budget Bureau, called NYCRI's nursing shortage study a "club" that the bureau could use against Health Services Administration workers "when they come in with budget requests for more nurses."[1109] In the short run, Lindsay's opponents tried, with considerable success, to turn the mathematical sophistication of NYCRI's models and analyses to their own advantage. When NYCRI made politically explosive recommendations, such as its proposals to phase out various police precincts, fire stations, and hospital beds, political opponents easily fanned public suspicions with accusations of methodological chicanery.

In the long run, however, Lindsay's opponents, like the firefighters' unions, recognized that they had to arm themselves with the weapons of systems analysis, or abandon the field of policy debate. It is here that NYCRI's history presents historians and public policy professionals with a wrenching dilemma. On one hand, RAND's analytical methods have demonstrated merits in issues of public policy and social welfare. The tools of applied mathematics and computer-assisted system analysis are powerful and can be of great benefit. In New York City, their use in fire protection, for example, may have prevented a collapse in one of the city's vital services. Forty years later, RAND's policy analysis methods are more advanced, more esoteric, and offer potentially greater rewards in careful application. On the other hand, RAND's systems analysis techniques, which underlie today's most widely taught and used policy analysis methods, are so complex that only a tiny fraction of the citizenry understands them. Furthermore, those who command the requisite skills can, if they choose, manipulate those methods so as to lend "scientific" credibility to specialized political interests. Meanwhile, those citizens lacking advanced specialized policy analysis training are at risk of exclusion from the public discourse that must characterize a healthy democracy. Exclusion leads to alienation, then to apathy, and eventually to despair of political processes. Thus, the widespread use of expert policy analysis, first employed systematically in municipal government by NYCRI, offers social benefits but only at the risk of alienation or manipulation of the uninitiated.

Back to Table of Contents

Chapter Thirteen
Daniel Ellsberg and RAND's Search for Stability, 1968-72

As the sun set on another picturesque Southern California day on October 1, 1969, an alarm buzzed at the West Hollywood police station alerting officers to a possible break-in at a nearby office building. The police alarm connected to Lynda Limited, a small advertising agency located on the second floor at the corner of Melrose Avenue and North Crescent Heights Boulevard. Rather than rushing to respond, however, two officers casually made their way over to check on the office. Casually, because this was not the first time alarms at Lynda Limited had sounded. On several occasions Lynda Sinay, a young entrepreneur then in her twenties, had accidentally set of the alarm by misusing her entry key. The policemen expected this to be the case again, so they showed little haste as they ascended the building stairs and approached the glass doors of Lynda Limited.

In fact, Lynda had again set off the alarm by accident, but what was going on in her offices was quite unusual. Inside the glass doors, a wiry-looking man in his late thirties was operating a large photocopier while Lynda and another man were shuffling papers at a nearby table. Tapping on the glass to get the young man's attention, the police asked for Lynda and, upon confirming another false alarm, politely asked that she be more careful in the future and then departed. They didn't notice that the man at the copy machine seemed rather nervous or that the documents he was copying were marked "Top Secret." They had no reason to ask, but if they had, they would have learned that he was Daniel Ellsberg, a top national security analyst at RAND Corporation and former assistant to Secretary of Defense Robert McNamara. That evening, and for each subsequent evening over the next few weeks, Ellsberg was surreptitiously copying a 38-volume top-secret study of American involvement in Vietnam that had been commissioned by Secretary McNamara in 1967. They could hardly have known, but the two police officers were witnessing the single greatest intelligence leak in U.S. history and the creation of the Pentagon Papers.[1110]

The arc of Daniel Ellsberg's career from the 1950s to the 1970s is emblematic of wrenching forces buffeting RAND throughout these years. Starting his career at RAND in 1957, Ellsberg was a prototypical scientific strategist, applying his Harvard education and Marine Corps experience to abstract decision theory and nuclear strategy. Moving with the other RAND Whiz Kids to McNamara's Pentagon, Ellsberg reached the pinnacle of national defense power, exerting personal influence on American war planning and strategy. As American involvement and Ellsberg's personal immersion in the Vietnam War deepened, however, he experienced severe disillusionment with U.S. actions in Southeast Asia. Nearing an emotional breakdown by 1967, Ellsberg returned to RAND for a second stint, this time expressing increasingly strident anti-war views. Once again, Ellsberg embodied the climate in RAND, in this case the deepening antagonisms stimulated by Henry Rowen's diversification strategy. Ultimately, Ellsberg's conscience drove him to violate his oaths of secrecy and publish the Pentagon Papers, bringing RAND to an existential crisis and catalyzing Rowen's downfall from RAND's presidency. Ellsberg's actions, however, forced RAND to grapple with the tensions of diversification, re-establish sustainable relations with the Air Force, and set a path forward under the leadership of Donald Rice. The present chapter chronicles these events and draws to a close our narrative of RAND's first decades and its diversification from national security into social welfare policy research.

Daniel Ellsberg, Cold Warrior

When Daniel Ellsberg began his first term at RAND as a consultant in 1957, he could hardly have been better suited to join the elite coterie of scientific strategists. Born in 1931 and thus only 26 years of age, Ellsberg had graduated summa cum laude from Harvard University in 1952, spent a year as a Woodrow Wilson Fellow at King's College, Cambridge University, and then joined the Marines in 1954. His military career was distinguished, as he rose to the rank of company commander and served in the Mediterranean Sea during the Suez Crisis of 1956. When his enlistment ended in 1957, Ellsberg returned to Harvard where he concentrated his graduate studies in the fields of economic theory, political theory, and mathematics—studies that reflected his interests in bargaining and game theory, problems of conflict and power in diplomacy, and in military strategy. In March, 1959, Ellsberg delivered the Lowell Institute Lectures at the Boston Public Library on "The Art of Coercion: A Study of Threats in Economic Conflicts and War." The excellence of his work on these topics caught the attention of Henry Kissinger, then a professor at Harvard, who invited Ellsberg to deliver two lectures at his seminar on the political use of irrational military threats.[1111]

At the same time, Ellsberg's work came to the attention of the head of RAND's Economics Department, Charles Hitch, who recruited Ellsberg to become a RAND consultant and then a full-time employee. Upon joining RAND, Ellsberg received Secret and then permanent Top Secret security clearances for his work in the application of game theory and bargaining to military situations. Specifically, his work concentrated on military command and control problems, NATO military strategy, the defense of "third area" countries, war termination tactics, and decision making under conditions of uncertainty. As he began his work at RAND, Ellsberg immediately developed a close working relationship with Albert Wohlstetter and the exclusive band of scientific strategists including Alain Enthoven and Henry Rowen, who were forming around Wohlstetter. When Enthoven, Rowen, and numerous other RAND staff members migrated to the McNamara administration in the Pentagon during the early 1960s, Ellsberg served as a key linkage between the Pentagon and RAND.

During this first engagement at RAND, which lasted until 1964, Ellsberg accumulated an impressive resume of consultancies as he shuttled between Santa Monica and Washington. During these years, Ellsberg provided top secret counsel to the White House and OSD on matters including strategic planning, national military command and control, general war strategy, and NATO policy and force planning. In addition, Ellsberg served on the crisis-management team assembled by Paul Nitze and Walt Rostow during the Cuban missile crisis in October, 1962. Altogether, his steadily expanding portfolio of consulting relationships had him spending as much as half his time at the Pentagon, working closely with Henry Rowen and other former RAND analysts.[1112] At the same time, Ellsberg completed his Ph.D. from Harvard and earned the glowing admiration of RAND's Economics Department head, Joseph Kershaw, who appraised Ellsberg as "a brilliant person (surely the highest I.Q. in our Department) with an intense interest in Air Force and military problems . . . . [He] is in universal demand by both universities and government."[1113]

Ellsberg's absorption into the Vietnam War began with the escalation of U.S. involvement that followed the alleged North Vietnamese attacks on American warships in the Gulf of Tonkin in 1964. Having previously declined several senior Pentagon positions, Ellsberg accepted an offer to serve at the highest possible civil service level, GS-18, as assistant to Assistant Secretary of Defense-International Security Affairs John T. McNaughton. McNaughton was running the Vietnam War out of his Pentagon office, and he assigned Ellsberg to spend all of his time on the mushrooming conflict. Characteristically, Ellsberg immediately immersed himself in operational planning and policy analyses relating to the expanding U.S. commitment.

In 1965, Ellsberg began looking for ways to become directly involved in the Vietnam conflict —even volunteering to fight as a Marine company commander. Ellsberg had been one of RAND's earliest travelers to Vietnam when he went there in 1961 to study the problems of limited warfare, but in 1965 he sought something different—direct combat exposure. Some observers have attributed his drive to enter the Southeast Asian fray as a means to "prove himself" after his wife sued for divorce and returned to California with the couple's two children. Certainly, Ellsberg became despondent as his personal life fell apart, and his colleagues at both the Pentagon and at RAND were struck by his emotional instability. Having been turned down by the Marines, Ellsberg volunteered to serve as special liaison officer under retired Major General Edward G. Lansdale—a shadowy counterinsurgency expert who had been involved in Vietnam since 1954. Officially, Lansdale and his team were to act as liaisons between the U.S. embassy in Saigon and the South Vietnam government's rural "pacification" efforts. In reality, though, Lansdale was actively involved in controlling the South Vietnamese regime and constructing the pacification programs.

Ellsberg spent much of 1965 and 1966 in Vietnam where, on many occasions, he accompanied Marine patrols in central Vietnam and Army units in the Mekong Delta. Frequently, these patrols placed Ellsberg into situations of mortal combat where his life was in danger. Gustave Shubert, whose work on counterinsurgency at RAND took him to Vietnam repeatedly in 1965 and 1966, recalls encountering Ellsberg in Saigon. Shubert remembers walking along the Rue Pasteur, where the RAND villa was located, and noticing on the opposite side of the street a figure "wearing bandoleers, carrying a grease gun over his shoulder, at least one .45 at his hip . . . armed to the teeth." Upon closer inspection, Shubert recognized the figure to be Daniel Ellsberg and, after crossing the street, Shubert asked what Ellsberg was doing dressed like that. With a straight face, Ellsberg told him, "I am here to kill communists."[1114]

It was during this experience, however, that Ellsberg's fervent "bloody-mindedness" began to wane, as was the case with some of his former colleagues at RAND. As Ellsberg's understanding of the Vietnam conflict and American intervention deepened over the next year, profound disillusionment began to supplant his enthusiasm for the conflict. Shubert noticed this essential change in Ellsberg's attitude after their first encounter on the Rue Pasteur:

> Every time I went to Vietnam, which was fairly often, would make it a point of seeing Dan, because he became one of my sources of information . . . . [O]n every one of those occasions I could see that, as we would say in the Marine Corps, his resolve was being sapped. He was having his eyes opened as to what was going on around him, and he was losing the faith.[1115]

Mirroring the experience of RAND specialists studying the war in Santa Monica, Ellsberg gradually came to believe in the futility of U.S. policies, and he became frustrated by American unwillingness to reconsider those policies. In the spring of 1967, Ellsberg was bedridden with a severe case of hepatitis, which gave him ample time to reflect on the "frustration and disappointment" he'd experienced over the previous 18 months.[1116] During these months of hospitalization, Ellsberg also conducted a prolific correspondence with his close friend and mentor, Henry Rowen—now just months into his tenure as RAND's president. These communiques, six of which survive in RAND's archives, express the deeply personal relationship between Ellsberg and Rowen and Ellsberg's growing disillusionment over the Vietnam conflict.[1117] Ellsberg's messages to Rowen were wide ranging in subject matter, but focused mainly on suggestions regarding the new president's management and diversification strategy. By the time of his recovery, Ellsberg had decided to leave Vietnam and return to RAND, and in his last dictation, he told Rowen,

> I almost shudder at the thought that [Robert] Komer may put on a good deal of pressure to stay on, pleading patriotism because, God knows, at this stage of affairs, nothing much else can hold me here. . . . I am ready to go and I want to go back to RAND. I am very clear on this.[1118]

As promised, Ellsberg rejoined RAND's Economics Department in July 1967 with a new outlook on Vietnam and the Cold War. Rowen ensured that Ellsberg was again granted top secret clearance less than a month later, a development Rowen would come to regret.[1119]

RAND's Early Social Welfare Research Strategy

At RAND, Henry Rowen's strategy of diversification into social welfare policy research transformed the organization despite the agonies of the New York City-RAND Institute. Whereas virtually no such non-military analysis had been performed as late as 1966, by 1972 social welfare or "domestic" policy research, as it was referred to within RAND, constituted more than one-third of RAND's program. Even though the NYCRI was embroiled in ongoing financial and political turmoil, RAND's involvement in urban policy-making in the nation's largest city generated considerable publicity and established RAND as a foremost social policy center. Furthermore, between 1967 and 1972, the domestic research program at RAND's Santa Monica headquarters grew to embrace policy work in such fields as education, health care and communications, and RAND created the RAND Graduate Institute—a graduate education program designed to school policy analysts in RAND's signature methodologies.

These organizational changes did not come without considerable cost and difficulties, however, since this period witnessed the accelerated deterioration of RAND's relationship with the Air Force and the emergence of painful organizational stresses within RAND. Deep internal divisions caused by RAND's diversification and exacerbated by the wrenching effects of the Vietnam War nearly splintered the corporation as entire research departments chose to split away and form independent enterprises. By 1972, the mixture of Air Force antipathy and internal divisiveness, catalyzed by Ellsberg's leaking of the Pentagon Papers, led to Henry Rowen's downfall from the RAND presidency. Still, the strategy undertaken by Rowen and the course his administration established survived these crises, and Rowen's successors continued to prosecute his vision for RAND's place in U.S. military and social welfare policy-making. Our narrative of RAND's transformation now witnesses these turbulent years and concludes with RAND finding at last a measure of stability as a renewed, diversified research institution.

RAND's formal diversification from national security into social welfare policy research had proceeded rapidly after RAND's board of trustees hired Henry Rowen as president in mid-1966. At the November, 1966, board meetings, Paul Armer and the "Future Work" team presented technical discussions of potential areas of domestic policy research, and the board, in April 1967, authorized Rowen to explore the possibilities of a research and training institute on problems of urban society. Rowen and his management team formalized their plans for such an institute by November, 1967, when their proposal for an "Institute for Study of the Issues of Society" received the trustees' "enthusiastic support." RAND management also created a special management/trustee development committee, which by the fall of 1968 had evolved into RAND's first development office, designed to identify and exploit sources of funding for Rowen's proposed institute.[1120]

Rowen's institute was designed, initially, to be the federal government's principal locus of social welfare research—a role usurped by the Johnson administration's new Urban Institute upon

its creation in 1968. However, the Institute for Study of the Issues of Society proposal continued to serve as RAND's guiding strategic document as Rowen and his management team worked towards diversification. Rowen's initial proposal identified slightly over twenty "classes" of study, concentrating on areas of race, education, public order, housing, health care, transportation, and environmental policy, which appeared promising as avenues of domestic policy research. Within these classes, Rowen's proposal listed more than fifty specific study areas, each of which was to be assigned a study area leader whose responsibility it would be to construct a research program.

One of Rowen's critical considerations was to leverage RAND's military research programs and contracts so as to provide a springboard into social welfare policy work. Indeed, Rowen visualized, at first, no organizational differentiation between the national security and domestic policy research efforts with study areas such as human resources designed to embrace both military and social policy research contracts. As Rowen wrote in 1967, "It is one of RAND's strengths that there can and should be communication and diffusion of research between the national security and public policy efforts, building on the extensive DOD work underway to furnish a base to work for other customers."[1121] To leverage existing national security research contracts, Rowen instructed the study area leaders to enlarge ongoing RAND work such that projects made overt consideration of the social and economic implications of military technology. Continuing the example of human resources policy research, RAND's studies of computer technology's ramifications for military personnel, training needs, management procedures, and operations could easily be translated into counterpart studies of such impacts on civilian sectors. Rowen astutely recognized that RAND had a built-in opportunity to conduct studies funded by the Air Force and DOD that could provide valuable springboards for diversification.

While Rowen's inability to establish RAND as the site of the Johnson administration's Urban Institute was a setback for his diversification strategy, the crescendo of urban violence during the summers of 1967 and 1968 generated a rising tide of social policy research demand. Within RAND, the urban riots provided Rowen with powerful justification for an aggressive diversification plan—justification that was especially important since support for diversification was not unanimous among RAND's trustees. Trustee T. Keith Glennan, for example, expressed the importance of the civil unrest as a motivating force when he wrote to Rowen,

> If our goal is a professional group of 150 people in these areas, the sooner we reach that goal the more we will contribute to the de-escalation of the urban chaos which threatens to engulf us. We need to view this task with the same urgency with which we attempt the solution of pressing military problems.[1122]

As was the case with the creation of the Johnson administration's "Great Society" social welfare policy initiatives, Rowen's and RAND's dedication to domestic policy analysis was deeply embedded within Cold War political considerations. In a talk to RAND's board of trustees in November, 1967, Rowen justified the aggressiveness of his diversification plans by arguing,

> [T]hreats to democratic government that stem from social inequities and the phenomenon of increasing political violence along with suppressive measures are not unique to America . . . . And our choices and effectiveness abroad are very much affected by our cohesion at home. Vietnam provides an important case in point.[1123]

RAND's conceptualization of the future challenges facing the U.S. military incorporated increasing concerns over the interactions between domestic and national security problems. In

1971, RAND prepared an analysis of the key problems the military could expect to face during the 1970s, and devoted considerable attention to domestic problems. Specifically, RAND's presentation to the Air Staff argued that bitter political divisions over racial, urban, and other domestic problems threatened to limit the President's power to unite the country during times of crisis. These social divisions combined with the lingering effects of the Vietnam War would affect U.S. military policy for the foreseeable future and diminish our ability to apply, or threaten to apply, conventional military force. Conversely, the RAND analysis pointed out that U.S. social disruption would encourage aggressive foreign policy by the Soviet Union since that country's leadership was certain to grasp the military implications of our domestic problems. The RAND presentation concluded that the social upheaval of the late 1960s diminished American willingness to take military action, and "That carries with it an increase in the risks of communist expansion."[1124] In other words, RAND believed that U.S. domestic and social welfare deficiencies presented a clear and present danger to national security.

RAND's Social Welfare Research Program

During the first five years of RAND's diversification, the corporation's portfolio of social welfare research expanded rapidly, averaging approximately 30 percent annual growth during this period. By early 1969, RAND already had secured approximately $5 million in domestic research support, about one-half of which was associated with the New York City program. Social welfare policy research, by then, employed about 90 full time equivalent professional staff members, again approximately half of whom were working on New York City contracts. Rowen's strategy of using New York City as a springboard for social policy analysis paid handsome dividends in Santa Monica as the size of RAND's domestic research efforts grew almost explosively. Several of the domestic research programs developed in Santa Monica between 1969 and 1974 were direct outgrowths of work begun in New York City. For example, RAND's environmental modeling techniques developed for analysis of Jamaica Bay were subsequently applied to studies of Tampa Bay, Port Royal Sound, SC, and estuaries in the Netherlands. Likewise, RAND's New York City housing policy research led to a contract with the U.S. Department of Housing and Urban Development for the design and execution of an extensive housing assistance experiment. Chart 1illustrates the rapid growth of RAND's domestic research programs both in absolute terms and relative to the corporation's national security programs. Indeed, the target environment in social welfare research was so rich that management's greatest challenge was to avoid spreading RAND's research capabilities too thinly over too broad a range of subjects. RAND management thus had to determine those areas which the corporation might penetrate most effectively and concentrate development efforts in those fields.

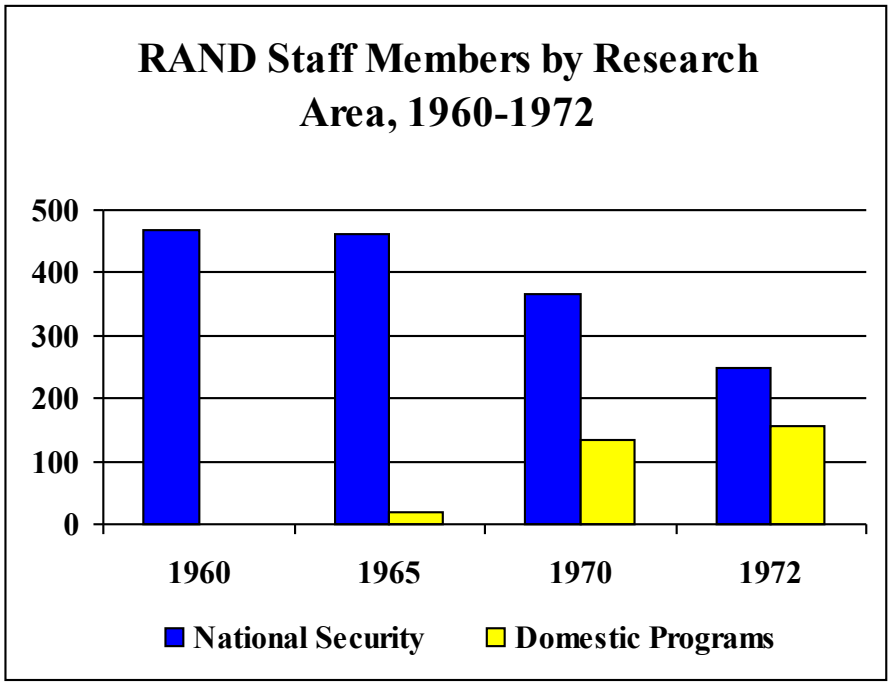


Chart 1. RAND Staff Members by Research Area, 1960-1972. Source: Henry S. Rowen, "Some Common Misapprehensions About Rand (and Other FCRCs)," March 22, 1972.

In November, 1969, Gustave H. Shubert, who was then RAND's vice president for development but would soon become vice president for domestic programs, laid out for the board of trustees a five-year plan for RAND's social welfare research programs. In this plan, Shubert identified six priority programs selected according to the following criteria: relevance to current policy issues, susceptibility to RAND's style of analysis, RAND's degree of prior experience in the fields, RAND's professional staff capabilities, and prospects for funding. Shubert's six priority areas included two geographically-defined programs, the New York City and California research programs, and four functionally-defined areas: biosciences and health care, communications and public policy, education, and environmental conservation and control. According to Shubert's plan, which included the financial and organizational implications of this strategy, RAND's national security and social welfare research efforts would be of essentially equal size by 1974.[1125] In reality, however, the growth of RAND's domestic research programs exceeded even Shubert's optimistic forecast. By 1973, RAND's domestic program areas had grown to include seven principal research programs, excluding the New York and California "area centers." The following section describes briefly RAND's main domestic research programs, except New York City, during the early years of RAND's diversification.[1126]

California Programs

In 1969, RAND undertook a program of research for the state of California that was designed along the lines of the New York City research effort but involving greater cooperation with the state's universities and other research organizations. RAND's location within the state of California and California's peculiar role as harbinger of policy issues for the remainder of the United States made the state a particularly attractive client for RAND. The California program was RAND's second "area" domestic study effort focused on the social policy issues of a specific

region and was intended to provide RAND with its initial exposure to state-level policy-making. The California program got underway with a grant of $125,000 from the Carnegie Foundation, an award intended to provide the seed money necessary to establish a long-term research program, and RAND's board committed up to $100,000 annually of RAND's internal research funds to the project.

RAND's plan for the California program was ambitious, beginning with a series of analytical studies of high-priority issues to be executed during the first two years of the project. These priority topics included environmental control and conservation, public education, and analysis of intergovernmental relations in policymaking, particularly as they related to education and environmental problems. RAND management then planned to extend this initial work into other fields, with an ultimate commitment of ten to twelve man-years of RAND staff and consultants' work annually.

Despite its apparent promise, however, the California program was slow in getting off the ground. By September, 1971, RAND had in place only one small research contract (with the Department of Human Resources Development), and the total value of this executed contract plus all outstanding proposals was less than $300,000.[1127] Gustave Shubert recalls a meeting with "Cap" [Caspar W.] Weinberger, who was California's director of finance under Governor Ronald Reagan, in which Weinberger listened to RAND's proposed research program and immediately informed Shubert that, "the state was not going to provide any wherewithal, and that if [RAND] were going to do this sort of thing, we would have to look elsewhere for money."[1128] RAND's California research program eventually blossomed into a diverse program of policy analysis, including work in the fields of transportation, civil justice, health care and manpower, and alternative energy sources, but it remained rather fragmented in its funding and policy focus.

Health Care and Biosciences

Bioscientific research, or the application of physics, mathematics, engineering, and computer science to biological and medical problems, was undertaken at RAND during the early 1950s. The corporation's earliest work in this field concentrated on studies of man-machine interaction, computer and biomedical systems, numerical analysis, mathematical and engineering research, optimization theory and mathematical programming, and stochastic and continuous simulations. Except for several relatively small projects performed under RAND's internal research funding, this work was conducted within the context of national security, especially nuclear weapons effects. By the early 1970s, however, RAND's biosciences research could be grouped in three general categories: a) physiological modeling projects, which used mathematical models and computational techniques to analyze and quantify the biochemistry of human physiological systems and phenomena; b) analyses of the mechanics and neurophysiology of human vision, pattern recognition, and image enhancement, in order to increase the effectiveness with which information could be transmitted to man; and c) research on clinical applications and diagnostic techniques, including computer support for biomedical graphics, a national biomedical communications system, closed-circuit television systems for the visually handicapped, coronary care unit effectiveness, and medical expert systems. Prior to diversification, most of RAND's bioscience projects were relatively small, involving one to three professional staff members, with the total bioscience program occupying the equivalent of approximately twenty full-time researchers. Furthermore, all of RAND's bioscience projects were executed in collaboration with various medical school and hospitals, due mainly to RAND's lack of clinical and laboratory facilities.

With RAND's diversification, Rowen and his management team combined RAND's biosciences work with its incipient analyses of health policy issues to form a broadly defined

program of research concentrating on five areas: health policy analyses, health services delivery systems, new methods of disease prevention, diagnosis, and treatment, the physiological mechanisms of health and disease, and population behavior. RAND's early work on health policy and health care delivery systems included research on health manpower requirements, government's role in health care delivery, medical technology assessment, and health care financing. RAND's work in this last field, health care financing, led to the initiation in 1972 of the RAND Health Insurance Experiment—the largest health policy study in American history. RAND's Health Insurance Experiment was a fifteen-year, $80 million project that enrolled 2,700 families in health insurance plans ranging from free care to 95 percent co-insurance. This study laid many of the intellectual foundations for the present health policy debate, and placed RAND at the center of health economics and policy research. Today, RAND continues to host the nation's largest private program of health policy research, with approximately eighty ongoing projects examining a dozen areas of health policy.

RAND's health and biosciences analysts also assessed new methods of disease prevention, diagnosis and treatment, including studies of medical research and development policies and alternative advanced medical technologies. RAND deployed its extensive modeling experience in constructing computerized tools to assist in chemotherapy management by simulating cellular kinetics and cells' responses to drugs. This work was closely associated with broader efforts at RAND to develop computer-based medical "expert systems" intended to improve physicians' judgment, intuition and clinical experience. RAND's study of physiological mechanisms, which began in the early 1950s, continued with research in three areas: biochemical systems modeling, biological mechanics, and man-machine interaction and information transfer. Particularly notable in this last area was Sam Genensky's development at RAND of closed-circuit television (CCTV) systems designed to assist visually handicapped persons. Genensky, who was himself legally blind, constructed a CCTV prototype, called RANDSIGHT I, that allowed individuals suffering from a wide range of eye disorders to take advantage of residual visual perception. An improved version of Genensky's prototype eventually reached production and was of benefit to thousands of visually impaired persons.

Finally, RAND's health and biosciences program in 1973 included studies in population behavior, which comprised work in the effects of income maintenance legislation, welfare policies, labor force analyses, population and demographic modeling, and U.S. interregional migrational flows. By the late 1990s, this initial work has grown to form RAND's Labor and Population Program, which continues to study U.S. labor markets, changing U.S. demographic patterns, the social and economic situation of the elderly, and Third World economic and social development.

Communications and Public Policy

Policy analysis in the field of communications was a natural extension of RAND's national defense research and played a key role in RAND's diversification. Indeed, the earliest research performed under Project RAND in 1946 was in the field of satellite systems. While RAND's technical contributions to satellite communications span the organization's history, RAND's efforts in non-military communications policy began in earnest during the early 1960s under contract with NASA. This work involved cost-benefit analyses of communications satellite systems, the policy implications of communication satellite developments, regulation of the telephone industry and evaluation of a global satellite system. During this period, RAND served as one of the nation's leading centers of expertise on communications technology and policy, and one of RAND's communications researchers, Leland Johnson, was appointed research director for the President's Task Force on Communications Policy during the late 1960s. RAND's program of research for NASA remained in place in the early 1970s, by then focusing on more

advanced satellite systems, including those for direct television broadcast. In terms of policy analyses, RAND's communications research by then concentrated on government regulatory policies, the patterns of ownership of communications and news media, and long-term projections of communications technology.

Associated with this last category, the corporation's largest communications research effort during the early years of RAND's domestic programs was in the field of cable television. This work concentrated on the prospects of cable television under liberalized Federal Communications Commission (FCC) regulations, and was funded by grants from the Ford and Markle Foundations. RAND's research in this field indicated that cable television's prospects were favorable, and that the development of cable television would not detrimentally affect the markets for commercial and non-commercial television. This research strongly influenced FCC rulings which, throughout the 1970s, established the structure of the current cable industry. In fact, RAND's influence in this process was demonstrated in 1971 when the federal government imposed a freeze on cable franchising by local governments to await the results of RAND's cable television case study in Dayton, OH. Since the 1970s, however, RAND's communications policy program has withered and no longer forms a distinct component of the corporation's domestic research efforts.

Education and Human Resources

RAND's research in education policy began in the late 1950s with Joseph Kershaw and Roland McKean's systems analysis of public education, which led to their 1962 book, Teacher Shortages and Salary Schedules.[1129] After RAND's decision to diversify, the corporation's education research extended Kershaw and McKean's focus on resource allocation and efficiency, especially the evaluation of experimental or innovative education programs. During the early 1970s, for example, RAND analysts designed and conducted evaluations of the federal Office of Economic Opportunity's Voucher Demonstration in elementary education and of alternative school financing proposals. In general, RAND's approach to education policy problems included six principal efforts: evaluation of experimental or innovative programs, analysis of educational effectiveness, improving resource efficiency in education, education research and development policies, the financing of schools, and educational technologies. RAND complemented this program of research with studies of vocational training and its impacts on employability, earnings, career choice, and mobility. Today, education and human resources research remains a cornerstone of RAND's domestic research program, with work focused in the areas of teachers' professional status, math and science education, educational technology, vocational training, and school policy and organization.

In addition to these major domestic program areas, RAND by 1973 was engaged in studies of energy policy, transportation, environmental control and conservation, housing, and urban economic development. The rapid growth of RAND's social welfare research effort generated an equally swift expansion in RAND's requirement for trained policy analysts. Unfortunately, the supply of individuals with advanced training in the application of RAND's systems analysis methods to social problems was quite limited. Only four universities (Harvard, UC-Berkeley, Pennsylvania, and Buffalo) had established graduate programs in policy analysis by the late 1960s, so the general expansion in policy research expenditures caused the demand for talented professionals to outstrip the supply. Unlike most of its competitors, however, RAND was in a position take advantage of that imbalance.

The Challenges of Organizational Change

While the development of RAND's domestic programs proceeded with alacrity and apparent success after Henry Rowen took office in 1967, diversification brought a host of wrenching problems. As discussed above, by the mid-1960s problems such as the deterioration of RAND's relations with the Air Force, the repercussions of the Vietnam War, and the aging of RAND's research staff had eroded morale and threatened RAND's long-term well-being. Still, a significant portion of the professional staff was deeply opposed to diversification and felt that it signaled RAND's abandonment of national security in the military's time of need. Henry Rowen's close ties with Robert McNamara exacerbated these feelings, especially among those who believed that RAND's primary loyalty remained with the Air Force. Rowen knew that he faced powerful opposition among RAND's staff and its trustees as he moved swiftly to recreate the corporation.

Within a year of taking office at RAND, Rowen plumbed the depths of this opposition by commissioning a study of morale at RAND by a psychological consulting firm specializing in business analyses.[1130] The consultants interviewed a total of 53 people at RAND, including all department heads, two program directors, three members of the Research Council, three contract managers, three deputy department heads, twelve presidential assistants, corporate officers or otherwise connected with Rowen's administration, four administrative assistants and sixteen members of the research staff. While generally favorable to Rowen's administration, the study's results confirmed the existence of several pockets of staunch resistance. Critically, even those interviewees who were favorably inclined towards diversification felt that Rowen's changes were generating new schisms within RAND. Most prominent of these was a rapidly emerging split between the military and non-military activities.

The strongest source of opposition to Rowen's diversification was among RAND's department heads—men who wielded considerable power under Frank Collbohm's regime but who were being supplanted by Rowen's program and project leaders. The consultants reported that approximately one-quarter of RAND's department heads were dissatisfied with Rowen's changes, and some were quite strongly dissatisfied. Overall, the study indicated that between ten and fifteen percent of RAND's staff were unfavorable towards diversification, and it identified the most prominent causes of disenchantment. These included the sense that RAND had little experience and capability to perform social welfare analyses, that politics rather than analytic criteria would define success in the new fields, and that RAND's "intellectual capital" was being drained by the New York City and other non-defense contracts. However, the criticism expressed most powerfully by the opposing minority was that diversification would lead to RAND's abandonment of the military in general and the Air Force in particular. The consultants' report indicated that a significant minority felt that diversification would injure RAND's relations with the Air Force and would invite retaliation, either budgetary or otherwise, against the corporation.[1131]

As RAND's diversification proceeded, the structural changes in RAND's staff composition were most striking. Henry Rowen believed that it would require a staff of between 100 and 150 social welfare researchers to constitute self-sustaining "critical mass" and to have a significant impact on social policy.[1132] Since RAND was, in 1966, virtually bereft of social policy analysts, Rowen's staffing objective necessitated an aggressive recruiting campaign which, in all likelihood, would have to precede RAND's accumulation of significant domestic research funding. As of February, 1968, RAND had already reassigned and/or recruited forty people to work full time on domestic research topics, including the New York City programs. A further complication was that the skills necessary to conduct social policy analyses were largely dissimilar from those that RAND had traditionally recruited. Specifically, RAND now had need for expertise in such fields

as urban sociology, race relations, social anthropology, labor law, government, city planning, and architecture—talents that RAND had not recruited previously.

As RAND's recruiting efforts got underway, it immediately became apparent that the demand for social policy expertise was fast outrunning the supply. Not only were American universities hiring large numbers of faculty members in the late 1960s, but government agencies at all levels were looking for policy analysts, either for direct employment or as consultants. Both of these offered attractive employment alternatives to individuals targeted by RAND recruiters. The recruiters did, however, report one factor that was working in their favor—news of RAND's diversification into social welfare research was spreading rapidly. Jerry Jensen, one of RAND's campus recruiters, reported as early as the fall of 1967 that there was a great deal of interest among students concerning RAND's new domestic agenda. Having recently visited thirteen universities where he met with over 200 graduate students, Jensen reported to Henry Rowen, "News publicity has been widespread about [RAND's diversification], and I estimate that at least half the students I talked with were aware of it before I brought it up."[1133] Furthermore, Jensen's interviewing schedules were nearly always filled—many times with waiting lists. While RAND's "war-mongering" image seldom came up—the RAND interviewees were self-selected—Jensen mentioned that Herman Kahn's name was raised in a negative sense at least ten times per year.

The changes dictated by diversification most dramatically altered the age and disciplinary composition of RAND's research staff. First, the impact of recruiting can be seen in RAND's age distribution, where the average age of staff members fell from 1968 to 1969—its first annual decline in the corporation's history.[1134] The influx of recent graduates to the domestic programs created the perception of generational differences between those programs and the aging, seemingly stagnant defense research effort. RAND quickly became an organization with two parts, rather than one unit performing two tasks. The second structural change, in disciplinary composition, was equally dramatic. Staff members with scientific and engineering training fell from 42 percent of RAND's total professional population in 1965 to just 24 percent in 1978. Over the same period, the proportion of social scientists grew from 11 percent to 23 percent. This meant that in combination with RAND's economists, who constituted a steady 15 percent of the staff, the "soft scientists" now dominated RAND's disciplinary make-up.[1135]

Even this growth in the proportion of social scientists underestimates the changes RAND underwent since it masks a subtle yet significant shift in power within RAND's social sciences. On one hand, the new social science recruits were quite unlike RAND's traditional Social Science Department staff members, and their arrival caused a schism within RAND's Social Science Department. Prior to diversification, RAND's Social Science Department essentially had been staffed by political scientists—individuals whose interests lay almost exclusively in international relations and strategy. As Gustave Shubert recalled, "their whole tradition was oriented toward the Cold War, relations with the Soviet Union, NATO problems." Ironically, then, RAND's Social Science Department housed some of the most adamant opposition to diversification, even though diversification quickly made social scientists the organization's most populous discipline. The tensions created within the Social Science Department are evidenced by the 1967 departure from RAND of Joseph Goldsen, who had long been a central figure in that department and was its head when Rowen assumed the presidency.

The tensions between the national security and the emergent domestic policy research in the Social Science Department gradually spread throughout RAND during the first two years of Rowen's tenure, and by 1970 were threatening to tear RAND to pieces. Rowen's diversification plans had initially envisioned only limited organizational divisions between the defense and domestic policy research programs, but in practice segregation between the two efforts seemed to be the only way to relieve the building pressure. Quickly, intense hostilities emerged between the

defense and domestic research staffs, as the two sides became socially, intellectually, and professionally isolated from each other. At this point, Gustave Shubert recalled, "RAND was on the verge of splitting in two amidst a sea of hostility and ill will."[1136]

In September, 1968, RAND's management committee discussed creating a small "open" or unclassified office area to accommodate domestic policy clients. Within a year, however, Rowen and his staff took up consideration of forming separate RAND institutes to segregate domestic from national defense research—plans that included the delineation of "open" and "closed" office areas on a much larger scale. When progress towards this reorganization stalled in 1971, many of the domestic researchers took matters into their own hands by moving their offices, en masse, to an unclassified section of the RAND complex.

Complicating matters further, Rowen's aggressive diversification coincided with a precipitous decline in RAND's relations with the Air Force. Despite the move into social welfare research and the longer-term expansion of relations with non-Air Force components of the Department of Defense, the original Project RAND contract still accounted for approximately half of RAND's research support in 1968. Furthermore, many of RAND's senior staff members and trustees remained deeply loyal to the Air Force, and were thus highly sensitive to continued erosion of RAND's ties to its original sponsor. By 1969, RAND began feeling the ingrained dissatisfaction of Air Force leaders, some of whom even saw RAND as a threat to Air Force interests in the Defense Department. In particular, their distaste was focused on Henry Rowen, the former McNamara "whiz kid" now in charge of RAND. After his appointment and throughout Rowen's tenure, RAND endured continuous difficulties in its national security research program, including the near-collapse of its relations with the Air Force.

RAND's Air Effectiveness Study and the Collapse of Air Force Relations, 1968-69

On paper, Henry Rowen seemed to be an ideal choice for RAND's presidency in 1966. He was young and enthusiastic; he had a vision of RAND's future that was in harmony with broader changes in American political and social conditions; and he had exceptionally close relations with Secretary of Defense Robert McNamara, who was in apparent command of the restructured defense establishment. Nevertheless, Rowen's appointment came as a surprise to many at RAND and in the Air Force—and not a pleasant surprise. Gustave Shubert recalls that the Air Force, "regarded Harry as the hair in their soup, the guy who was always going out of his way to do them in . . . . He was one of McNamara's boys . . . and [he] came in under a very black Air Force cloud."[1137] Inexplicably, RAND's board of trustees does not appear to have consulted or even advised Air Force leadership of Rowen's candidacy for RAND's presidency. As such, they were unaware of the deep enmity that Air Force leaders harbored for Henry Rowen. This was a critical error since, despite Rowen's plans to diversify into social welfare research, RAND in the late 1960s remained a military research and analysis organization—and Project RAND remained the core of its program.

Throughout the 1960s, the relationship between RAND and the Air Force had steadily deteriorated—a process driven most prominently by RAND's apparent shift of allegiance towards the Office of the Secretary of the Defense. RAND-Air Force problems came to a head during 1966, when the two parties engaged in a lengthy and rancorous dispute over the renewal of the Project RAND contract. The resolution of the impasse, finally achieved in November, 1966, replaced the existing pattern of one-year contracts with a five-year deal designed to stabilize the relationship. However, relations between RAND and its principal client had been deeply scarred. Frank Collbohm spent much of his last months in RAND's presidency trying to rebuild relations with the Air Force and admonishing RAND staff members to focus more intently on Air Force

needs. In one management committee meeting, for example, Collbohm noted that the number of RAND briefings to the Air Staff had dropped from forty-four in the first half of 1965 to just twenty-seven during the same period of 1966. Publications were likewise down in numbers, from 250 in the first six months of 1965 to 150 in 1966.[1138] In November, Collbohm reiterated his insistence that RAND submit more formal recommendations to the Air Staff, so as to allay Air Force fears that RAND was "losing interest" in Air Force problems. By then, however, Collbohm's influence was fast slipping away, as Rowen's agenda for diversification was taking center stage in management as well as board meetings. By February, 1967, Collbohm had stopped attending RAND's weekly management committee meetings and appears to have withdrawn entirely from influence.

RAND's selection of Henry Rowen to succeed Collbohm as president dismayed Air Force leadership. As one of Robert McNamara's closest civilian advisors, Rowen seemingly had been at the forefront in frustrating repeated Air Force policy initiatives. Furthermore, Air Force leadership by the late-1960s had passed from the World War II generation to a younger cadre of officers. While many of the older generation had extensive experience in working with RAND, members of the younger generation were mainly "operating" men from the Air Force's Strategic Air Command (SAC). During the early 1960s, the ascendance of long-time SAC commander Curtis LeMay to the position of Air Force Chief of Staff had resulted in LeMay's "SACemcision" of U.S.A.F. headquarters. For RAND, this meant the elevation to leadership of a phalanx of officers who had been inoculated with LeMay's antipathy towards RAND.

Air Force antagonism towards RAND and its new president turned to abhorrence when RAND's first major air power study under Rowen, "The Effectiveness of Airpower in Vietnam," proved to be an indictment of Air Force efforts in Vietnam. In early 1967, Secretary of the Air Force, Harold Brown, asked Rowen to assign a group of RAND analysts to head a special Study Group on the effectiveness of airpower in Vietnam.[1139] The study group was to be located at the Pentagon, and report directly to the Secretary and to the Air Force Vice-Chief of Staff, General Holloway. Rowen readily agreed to support Brown's study, and within a few weeks a group of RAND staff members had formed an integrated team with selected members of the Air Staff's Operations Analysis Group. RAND's Edward P. Oliver, of the corporation's Washington Office, took direction of the combined study group, which was supported on particular research topics by specialists in Santa Monica.

Brown's purpose in appointing the study group was to obtain an "informed, independent, objective, and insofar as possible quantitative assessment" of the achievements, or lack thereof, of airpower in the Vietnam War. Brown was frustrated by the Air Force's uniformly optimistic reports, and he asked the RAND team to focus on the effectiveness of the air campaign in relation to its goals, especially on measures of output (the effects of air power) rather than on measures of input (e.g., sorties flown, ordnance delivered). In general, Oliver's study team viewed the air campaign against North Vietnam fundamentally as an interdiction campaign, supplemental to the war in South Vietnam but not a substitute for it. U.S. bombing efforts imposed a "strain" or price on North Vietnam, specifically through attacks on the lines of communication (LOC's) leading into South Vietnam, and more generally through attacks on the whole transportation network, on military facilities, and on such selected targets as petroleum supplies and electricity generating stations. The study group set out to determine how great the strain imposed on North Vietnam had been, and at what cost that strain had been imposed. By February, 1968, Oliver's team had delivered its first interim report to Secretary Brown.

The RAND analysis found that although U.S. air action in Vietnam had emphasized "interdiction" targets, the amount of damage inflicted on enemy cargo was small. In fact, the study group concluded that with approximately 180 sorties per day against enemy carriers (trucks,

railroad stock, and watercraft) and LOCs, the Air Force had managed to destroy no more than 100 to 200 tons per day on the average across the entire region, including non-military cargo, during the period September 1966 to December 1967. The RAND study further estimated that U.S. air interdiction efforts had decreased the potential truck deliveries from North Vietnam through Laos into South Vietnam from an uninterdicted level of approximately 500 tons per day to an average capability of around 100 to 150 tons per day on an annual basis.

While this appeared to demonstrate some effectiveness, the RAND team calculated that enemy requirements in South Vietnam for materiel shipped from the North were only 15 to 100 tons per day at the 1967 rate of consumption. Thus, the study group concluded that the actual deliveries to South Vietnam probably exceeded consumption requirements, and that the enemy was actually building supply stockpiles within South Vietnam and on its borders as the American air interdiction efforts were underway.

The RAND study group also evaluated the impact of U.S. air actions on North Vietnam's manpower supplies, especially in light of a recently concluded Air Staff report on the same topic. This Air Staff study, completed in early 1968, had concluded that by mid-1967 the North Vietnamese economy was already suffering from a "deficit" of 190,000 workers, and that the requirements for transportation and other war-related work had restricted the expansion of the armed forces and activities in South Vietnam. The RAND report contradicted these conclusions, finding that the Air Staff study vastly overstated the North Vietnamese manpower problem because it did not consider existing manpower slack in Vietnamese agriculture and other economic sectors, the possibilities for increased efficiency in labor use in North Vietnam, and the willingness of North Vietnamese to reallocate labor from peacetime to wartime objectives. Most importantly, the RAND group found that Air Staff estimates that 500,000 to 700,000 full and part-time North Vietnamese workers had to be diverted to the transportation system gave an exaggerated impression of the demand for transportation labor created by the bombing campaign. Oliver's team argued that a more realistic figure would be about 250,000 full-time equivalent workers. Furthermore, the combination of this estimate with re-calculated labor supply estimates indicated that North Vietnam had not only the manpower necessary to meet current demands, but could meet considerably larger demands in the future if, for example, the North Vietnamese government decided to increase the size of its armed forces.

With regard to food production, the RAND study group concluded that the U.S. air campaign had little influence on North Vietnamese food output. It had been suggested in some quarters of the Air Force that a war- and bombing-induced diversion of farm labor to other uses had caused a significant decline in output, but RAND's analysis found no such effects.

Finally, Oliver's group evaluated the effects of U.S. air actions on North Vietnamese industrial production. In this case, North Vietnam had never relied on its own industrial sector for its supply of weapons or ammunition. The country's heavy industry component was very small relative to its light manufacturing and handicraft component with national output geared principally to supplying consumer goods, some specialty items for export, and a limited amount of machinery and equipment production for domestic industry. Again, the RAND team found that "Given the current rate of imports, there are no quantitatively observable measures of the North Vietnamese industry which indicate that their ability to continue the war has been materially affected because of the bombing." Instead, RAND concluded that the bombing of industrial targets in North Vietnam had imposed a "strain" on the enemy's economy only in that it required some dispersal of plants and equipment, it hindered some raw materials exports, and had inflicted limited damage on North Vietnam's only steel plant.

By early July, 1968, the RAND study group had completed its summary report, and prepared a briefing for the top leaders of the Air Force. In an unusual move, the former McNamara "whiz

kid" Brown personally and gleefully presented the RAND study findings to a horrified and apoplectic Air Staff. Edward Oliver reported to Henry Rowen, "With obvious enjoyment the Secretary assumed the burden of explaining and defending the Study Group's 'Summary' Report. There can be no doubt that he liked the report and generally accepted its conclusions."[1140] The Air Staff reaction, however, was "strongly, emotionally, negative and defensive." As Oliver reported,

> [N]one of us expected such strong dissent. The Chief of Staff repeatedly asked, 'What shall we do with this report?' He meant, this is an embarrassing report; it could do the Air Force harm if it reached OSD or the Congress. How shall the Air Force handle this hot potato? How, he seemed to be asking, can it be made harmless?[1141]

Debate over the report was fierce, with Secretary Brown taking the lead in defending the study and its conclusions. On one point, for example, the Air Force claimed that its campaign had destroyed as much as 50 percent of annual imports into North Vietnam, but the RAND study found the figure to be between 2 to 4 percent. The differences were not in shades but in orders of magnitude.

While the RAND analysts felt strongly that they were supporting the Air Force by constructing a carefully researched and documented critique of Vietnam operations, Air Force leadership perceived the sinister workings of a McNamara-Brown-Rowen axis. Instead of providing "valuable heresy", RAND appeared to be undermining Air Force policy positions, and making Air Force staff work seem incompetent. Furthermore, the RAND air effectiveness study could not have hit the Air Force at a poorer time. Late 1968 and 1969 were, perhaps, the most difficult years in Air Force's twenty-year history. Budget cuts, public dissatisfaction, credibility questions, unfavorable public relations over huge aircraft contracts, and a growing distrust of all things military combined to put the Air Force on the defensive.

The repercussions of the air effectiveness study were not long in coming. With the election of Richard Nixon to the Presidency in November, 1968, Harold Brown and the remnants of the McNamara revolution became lame ducks. With RAND's OSD air cover thus evaporating, the Air Force moved aggressively to re-assert its command over the Project RAND research program. At RAND's semiannual meeting with its Air Force Advisory Group (AFAG) in November 1968, AFAG members sat stonily through Rowen's summary of the Project RAND research program, then expressed in "lively discussion" their concerns over the project's scope and content.[1142] AFAG announced that, going forward, it would, "formulate a position on the preferred character and shape of the RAND program."[1143] This formulation would take the form of periodic statements, perhaps two per year, by AFAG of the major issues facing the Air Force, categorized in terms of priority. This guidance statement would include three lists that would provide official Air Force guidance in structuring and orienting Project RAND: a list of major force issues and problems, a list of projects currently in the program that the Air Force believe to be of little relevance or value, and a list of studies that the Air Force has requested, but that RAND had not undertaken.[1144]

In March, 1969, AFAG delivered to RAND its first "Major USAF Issues and Problems for RAND Guidance," which RAND was expected to utilize in constructing the Project RAND research program. Additionally, AFAG required that RAND report at its semiannual meetings the corporation's progress according to the priority statement. Rowen and his staff immediately set to work reallocating staff members according to Air Force priorities and terminating projects that the Air Force found undesirable. Clearly, this assertion of Air Force control over the scope and content of Project RAND research was a sharp break from the procedures that had been in place

since RAND's creation. Until 1968, the content of the Project RAND program had been determined by RAND management, with limited and informal coordination with the Air Force. Going forward, however, the Project RAND program would be much more closely and directly managed by the Air Force. Project RAND's existence as an unfettered research program had come to an end; it would now evolve quickly into a task-oriented program, with the Air Force choosing the tasks. Indeed, by late 1970, the Air Force was pressing RAND for "tail number allocation" of researchers to Air Force projects. In other words, the Air Force demanded veto power over the assignment of key researchers to non-Air Force projects. Further, once these researchers were committed to Air Force projects, the Air Force required that RAND gain its approval before reassigning the staff members.

In 1969, the Air Force struck an even harsher blow. As late as February, 1969, the Project RAND budget for fiscal year 1970 appeared to be approved at $15.6 million, representing a $600,000 increase over 1969. However, in that month, RAND's Washington staff began hearing rumors that the Air Force intended to cut the Project Rand budget to $12.6 million for FY 1970, with a further cut to $10 million in the following year—a funding cut of one-third over just two years. Henry Rowen hastened to the Pentagon to explore the rumors and found, to his horror, that they were well-founded. While RAND's five-year contract for Project RAND specified an initial funding level of $15 million, funding in subsequent years was "according to availability." Air Force leaders firmly defended the reduction as necessitated by funding shortages, but to those at RAND the cuts were unquestionably punitive.

Rowen appealed RAND's case to the Director of Defense Research and Engineering (DDR&E) in the Office of the Secretary of Defense, arguing that the one-third cut in Project RAND funding would require a contraction of assigned staff by 40 percent. DDR&E John Foster, one of the few holdovers from the Johnson administration, temporarily restored the contract amount to $15.6 million at Rowen's pleading. In a move that may have been unprecedented, however, the Air Force appealed to Foster to have the budget cut restored, and, in the end, the Project RAND budget program was slashed by more than a third. As a result of these cuts, the number of RAND staff members working under Air Force funding in fiscal year 1972 had fallen to 140—smaller even than in the year of Rand's incorporation, 1948, when 185 professionals were so engaged.[1145] RAND's relations with its oldest benefactor were collapsing, and the members of RAND's staff and Board of Trustees who believed that RAND should play a central role in American national security were deeply alarmed.

The Growing Crisis at RAND

Unfortunately for RAND, Henry Rowen was incapable of rebuilding RAND's faltering relations with the Air Force. Among Air Force leaders, Rowen's long relationship with McNamara was unforgivable; his closeness with Harold Brown had caused the air effectiveness study fiasco; and his diversification strategy was diverting key researchers to non-Air Force problems. Rowen attempted to mollify Air Force concerns that RAND was abandoning national security research by proposing the creation of separate RAND institutes to house the corporation's defense and domestic research activities. This institute structure ran contrary to Rowen's belief that RAND had a unique advantage in conducting social welfare research because it could leverage its long military research experience and foster cross-pollination between the established defense program and the upstart domestic work.[1146] He was loath to segregate the two functions by creating organizationally and physically distinct entities, but he was in danger of being overtaken by events as civil war brewed in RAND's hallways.

In August, 1969, Rowen outlined his plans for RAND's reorganization into separate institutes in a memorandum entitled, "The Need for a Restructuring of RAND."[1147] This essay proposed the creation of three entities structured around RAND's core activities: national defense research, domestic policy research, and graduate education. Rowen's memorandum left unresolved the details of a reorganization, such as the legal status of the institutes, but it provided a general framework. RAND's board of trustees quickly approved Rowen's plans for a national defense "institute" as a means of tempering Air Force hostility. In December, 1969, board chairman David Shepard wrote to Secretary of the Air Force Seamans, "To emphasize the importance we attach to work in national security, the Trustees have authorized the establishment of a RAND Institute for National Security Studies. All RAND's work for the Air Force, for other agencies of the Department of Defense, and defense related activities, will be part of the responsibilities of this Institute under RAND management."[1148]

By early 1970, however, RAND's trustees were growing impatient with Henry Rowen's management of the corporation. Throughout RAND's history, the corporation's board of trustees had provided RAND with invaluable connections throughout American academia, industry, and government, but its members had very rarely intervened in management matters. However, the problems in New York City, the collapse of RAND-Air Force relations, and the simmering tensions within RAND shook the board out of its characteristic lethargy, and incoming board chairman Newton Minow insisted upon assuming a greater role in RAND's management. RAND appeared to be nearing a crisis, and faith in Rowen's ability to find a solution was dwindling.

Most immediately, Minow was concerned by RAND's deteriorating financial condition, and he postponed Rowen's proposed reorganization until a thorough evaluation of RAND's situation and direction could be performed. Indeed, RAND had experienced almost continuous financial difficulty throughout the latter half of the 1960s due to the imposition of the 1965 defense funding ceiling, which caused a steady contraction in RAND's real defense research funding, and Rowen's aggressive use of RAND's internal funds to fund diversification. In April, 1967, Rowen had met with Secretary of Defense McNamara and his Assistant Secretary Cyrus Vance to present RAND's financial plight and to appeal for help. McNamara responded with a memorandum to the Defense Comptroller ordering that $2 million be added to RAND's fiscal year 1968 budget, thus giving RAND a temporary funding boost.[1149] In November, 1967, RAND treasurer Scott King reported to the board of trustees that RAND's cash position in excess of day-to-day operating requirements was $1,200,000.[1150] With this surplus in mind, the trustees approved Rowen's plan to increase RAND-sponsored domestic research funding by $600,000, with $400,000 to be available immediately and $200,000 in 1968.[1151] In April, 1968, Rowen submitted for board approval his 1969 budget, which included $950,000 in RAND-sponsored research expenditures for domestic programs. Although such expenditures ruled out any contributions to RAND's working capital fund, Rowen argued that the urgency of the nation's deepening social unrest justified the spending. RAND's board approved Rowen's strategy with the statement, "increasing national concern with societal problems, largely urban, justifies a maximum corporate effort on such problems and further postponement of contributions to a reasonable corporate contingency fund."[1152]

Between April, 1968, and early 1970, RAND's financial condition deteriorated rapidly, thereby seizing the trustees' attention. By the end of 1968, the corporation's excess funds had diminished to $358,000, and RAND's treasurer reported that corporate working capital had contracted by $550,000 during the year. This downward trend accelerated in 1969 and 1970 with the dramatic cuts in Project RAND funding. Further, New York City's slow payment practices meant that by early 1970, the city owed RAND over $2 million for research already completed.

As a result of these forces, by April, 1970, RAND not only lacked excess funds, but the corporation had been forced to borrow to meet cash demands. RAND was thus already in financial jeopardy when, in September, 1970, New York City Comptroller Abe Beame suspended payment on all of the city's contracts with the NYCRI. RAND's guarantee of the NYCRI's financial obligations caused the parent organization to begin hemorrhaging cash when city payments stopped. At their November, 1970, meetings, RAND's trustees learned that RAND was already exposed in New York City for over $1 million, and that total losses could be as high as $1.3 million.

As RAND's financial difficulties deepened, RAND's board of trustees began losing confidence in Henry Rowen's leadership. Upon taking office as as RAND's board chairman in April, 1970, Newton Minow requested Richard A. Yudkin, a retired Air Force colonel and RAND consultant, to conduct interviews with top Air Force leaders regarding RAND-Air Force relations. Yudkin's conversations exposed deep animosity directed towards RAND and its leadership.[1153] Furthermore, three nearly simultaneous events raised questions about Henry Rowen's management capabilities: the public airing of RAND's internal schism over Vietnam, the wholesale departure from RAND of most of its Physics Department, and the persistence of published reports that RAND had studied for the Nixon administration the possibility of canceling the 1972 U.S. presidential elections.

On 9 October 1969, the New York Times carried a news story under the headline, "Six RAND Experts Support Pullout," based on a letter written to the editors of the paper by six RAND staff members.[1154] Authored principally by Daniel Ellsberg, this letter argued persuasively that American policies in Vietnam were both morally untenable and militarily unwinnable, and demanded that the United States withdraw from the conflict. Prior to submitting the letter to the New York Times editors, Ellsberg and his co-signatories had delivered a copy to Henry Rowen and RAND's vice president for administration, J. R. Goldstein. Rowen quickly arranged a meeting to discuss the letter's legality and ramifications, and both he and Goldstein tried to dissuade the group from publishing their anti-war statement.[1155] Failing in this endeavor, Rowen and Goldstein gained assurances that the letter would not be printed on RAND letterhead, that it would clearly state that the arguments presented were, in fact, personal opinions and not the results of RAND studies, and that the letter would indicate that the views expressed were not shared by all of RAND's professional staff members. Goldstein argued strenuously against the letter's publication, citing the damage it might do to RAND's already strained defense relationships and the dangers of adding fuel to RAND's smoldering internal conflict over Vietnam. In the end, however, he admitted that neither he nor Rowen could prevent the group from sending the letter, and the matter was left to the authors' discretion.

Ellsberg contacted the Los Angeles office of the New York Times to find out how the letter might most expeditiously be published. The Times decided, due to the import of the letter, to print a story rather than the letter itself, thus giving it even more prominence. At RAND, Rowen and Goldstein worked furiously at damage control, sending advance copies of the letter to RAND's board, the Secretary of Defense, the Secretary of the Air Force, the Air Force Chief of Staff, and other top Pentagon and White House officials. RAND staff member Fred Ikle went personally to explain the situation to President Nixon's closest advisor, Henry Kissinger. As Ellsberg later recalled in his memoirs, "I knew I really was going to cause [Henry Rowen] terrible trouble."[1156]

Response to the Ellsberg letter reflected the deeply divided perspectives of the national security and social welfare wings of the organization. On one hand many among the social welfare research staff applauded the letter, and RAND received some favorable comments from foundation officials who were pleased that RAND was not a "kept military organization."[1157] In

the cloistered national security research hallways, on the other hand, the reaction was vitriolic. Gustave Shubert, who did not sign the letter but argued with Goldstein that it should be published, recalled that, "the majority opinion in RAND was that these people were simply gutless bastards. That's strong language, but there was a lot of strong language around the halls."[1158] Within days, Charles Wolf and three other RAND staff members had submitted a rejoinder to the New York Times and the Washington Post, expressing their support for the Vietnam effort. Publication of Wolf's retort to RAND colleagues further aired the corporation's dirty laundry and focused public attention on RAND's internal divisiveness. Most importantly, both letters widened the cracks in Henry Rowen's management edifice since, for Rowen's detractors within both RAND and the military, their publication seemed to confirm his managerial weakness and his unreliability in pursuing military interests. Unfortunately for Rowen, subsequent events would do little to moderate these opinions.

While publication of the anti- and pro-war letters by the New York Times made public simmering tensions within the organization, the departure of the Physics Department raised the specter of RAND's disintegration. During the 1960s, RAND's Physics Department included approximately thirty-two professional researchers who focused almost exclusively on nuclear weapons research. The department, in these years, was dominated by Richard and Albert Latter, both of whom were zealous anti-communists and close allies of Edward Teller. The Latter brothers had played leading roles in the debates concerning the worldwide effects of nuclear weapons testing, and were especially active in attempting to discredit the Nuclear Test Ban Treaty of the early 1960s. Importantly, both of them were deeply opposed to RAND's diversification since it seemed to them to diminish RAND's commitment to national defense research.

The events leading to the physicists' departure began in early 1970, when Rowen informed Albert Latter, then the Physics Department head, that the physicists would have to share in the general staff reductions necessitated by Project RAND cutbacks. Up to that point, the Physics Department largely had been spared the effects of Project RAND reductions, but now Rowen asked that Physics adopt staff reductions similar to those experienced in other departments.[1159] Albert Latter rejected Rowen's proposed cuts, and instead determined to seek funding specifically for the Physics Department outside of Project RAND. This dispute between the Latters and Rowen was complicated by the physicists intense dislike for Rowen's vice president of research, Bruno Augenstein. While Augenstein had impeccable credentials in space science and engineering, the physicists found him unqualified to oversee their research program. As such, they chaffed under Rowen's management structure, which forced Albert Latter to report to Augenstein.

Despite Rowen's attempts to reach a compromise with the physicists, Albert Latter announced in October, 1970, that he and sixteen other physicists—the core of RAND's capabilities in nuclear weapons design and effects—were departing the organization with the contracts they recently had negotiated. Latter argued that, as a part of RAND, the Physics Department would be inhibited from securing additional research contracts since RAND, as an FCRC, was subject to the Department of Defense budget ceilings. Furthermore, their success in securing so rapidly ample research funding promised an opportunity to conduct more exploratory research than was possible at RAND. An unspoken factor, but certainly one of great significance, was the opportunity to leverage the substantial intellectual capital amassed under RAND's non-profit public funding. Over twenty-five years, RAND's Physics Department had acquired highly valuable and marketable capabilities, and the physicists' creation of a for-profit enterprise proved to be an exceptionally lucrative venture.

As these events were proceeding, RAND encountered yet another public relations setback—persistent published reports that RAND was studying the cancellation of the 1972 U.S. presidential elections. On 5 April 1970, the Newhouse National News Service reported,

> The White House is ordering up several hush-hush security studies and one of them is reported to address the question: What would happen if there is no presidential election in 1972? President Nixon's advisers are understood to be increasingly concerned about the country's internal security—and the chances of radical elements disrupting governmental operations, including national elections. The study apparently has been undertaken by the Rand Corp., a defense-oriented California "think" factory, will try to envision a situation where rebellious factions using force or bomb threats would make it unsafe to conduct an election and provide the President with a plan of action.[1160]

In fact, this writer could find no evidence within RAND or elsewhere that any of RAND's clients ever proposed such a study or that RAND undertook any work in this area.[1161] To RAND's dismay, however, the story subsequently was picked up and reported by such widely-read periodicals as the Wall Street Journal and The Nation, and resurfaced repeatedly over the next two years.[1162] The Seattle Post Intelligencer, for example, published an editorial entitled, "A Sinister Study," which described the study as, "a first giant step down the dangerous road to tyranny."[1163]

On 25 April, Henry Rowen issued what one magazine referred to as "one of the most denyingest denials heard in some time."[1164] Rowen stated, "The RAND Corporation has not undertaken such a study; it does not contemplate making such a study; nor has it been approached by anyone with a proposal for such a study." Despite considerable effort, no one at RAND was able to identify the source of the persistent election study rumors—rumors which seemed to play on the country's mood and RAND's nefarious image as a "master-mind" organization. Daniel P. Moynihan, then counselor to President Nixon, structured his commencement address to Fordham University graduates in June, 1970, around the RAND election study rumor.[1165] Moynihan noted that while there appeared to be no factual basis for the story, White House staff members conducting campus visits reported encountering the story at every college or university they visited. For Moynihan, this willingness to believe the darkest, most malignant rumors about the nation's leadership was an ominous sign, for it indicated that fear and distrust of the government had reached epidemic proportions. For RAND, however, the persistence of the rumors was a further blow to the organization's reputation and to its management team. While Henry Rowen could not be blamed for the onset or persistence of the election study rumors, the upshot of the Vietnam letter exchange in the New York Times, the departure of the Physics Department, and the election study issue was an intensification of concerns among RAND's trustees that things were going badly wrong.[1166]

Determined to overcome these setbacks and demonstrate for Air Force leaders his loyalty, Rowen decided to make a bold but poorly advised move in the summer of 1970. As one of its high priority issues, the Air Staff had asked RAND to conduct a comprehensive study of the Air Force's role in national defense in the 1970s. Rowen selected this issue as the focal point for RAND's 1970 summer study and, to nearly everyone's dismay, appointed himself to be the project leader. Never before had RAND's president taken such an active role in a study project, and the "Air Force of the 1970s" was no ordinary project. As Gustave Shubert recalls, this was "a great big look at the role of the Air Force for the United States, the whole world, humanity, the dog pound, everybody."[1167] Even with complete cooperation from the Air Force, ample time, and

undivided focus, the successful execution of such a project would have been difficult. Unfortunately, Rowen had none of these luxuries.

To the dismay of RAND's trustees, the summer study was a "horrendous flop."[1168] Rowen and the RAND team delivered their report, entitled "The Air Force in the 1970's: Alternatives for Preserving Capability Under Tighter Resource Constraints," to the Air Staff on 17 August. Shubert, who attended the briefing, commented,

> [T]here was no joy in Mudville that night, I can tell you. It was not a good show. . . . I think the Air Force thought it was testing Harry and his loyalty—to see if he had any left, in their view,—and RAND. They were very unhappy with what they got, and for dessert the Pentagon Papers were dumped in their laps.[1169]

With the New York City payment crisis was in full swing in November, 1970, RAND's board of trustees appointed a special committee, under the chairmanship of trustee Don K. Price, to conduct an examination of RAND's research program and the deterioration of RAND-Air Force relations.[1170] Even some of Rowen's strongest supporters among the trustees were concerned by the adverse turn of events. Furthermore, several of the trustees who supported diversification were now expressing reservations about particular aspects of the social welfare research agenda. Frank Stanton, for example, who was the president of CBS, reacted unfavorably to the news of RAND's cable television study.[1171] Similarly, Michael Ference, an executive with the Ford Motor Company, was opposed to RAND's involvement in environmental studies, partly due to their potential effects on the American automobile industry. Implicit in the Price Committee's work was an evaluation of Henry Rowen's leadership and strategy—both, by then, deeply in question. As it turned out, however, the Price Committee did not have to take decisive action. The fruit of Daniel Ellsberg's many nights of photocopying would soon land on the front page of the New York Times, and take matters out of the board's hands.

Et tu Daniel: The Pentagon Papers and the End of the Rowen Era

In June 1967, Secretary of Defense Robert McNamara asked his assistant secretary for international security affairs (ISA), John McNaughton, to undertake a comprehensive historical study of U.S. involvement in Vietnam. In his book, In Retrospect: The Tragedy and Lessons of Vietnam, McNamara states that he authorized the study to ensure the survival for future historians and policy makers of a complete and accurate record of American involvement in Vietnam.[1172] Legal scholar David Rudenstine, however, argues that such motivations must be placed into the context of McNamara's deeply distressed frame of mind during the summer of 1967. As Rudenstine writes, "McNamara not only fashioned the policies that resulted in an intractable war that caused the death of tens of thousands but he continued to implement those policies—resulting in many more deaths—long after he had concluded that the administration's course of action in Vietnam had failed and would continue to fail."[1173] Rudenstine thus finds that commissioning the study may have served as an "act of confession" for the profoundly troubled and introspective McNamara. Rudenstine's conclusions are not contradicted by McNamara's own words of contrition in In Retrospect.

RAND's archival record sheds some light on McNamara's motivations and indicates that the Secretary was intent on gaining an intellectual understanding of the morass into which he had led the nation. On 21 July 1967, Henry Rowen met with McNamara and Paul Nitze at the Pentagon to discuss, among other things, RAND's contribution to the Vietnam history study. In his memorandum of the conversation, Rowen relates McNamara's statement that, "we needed to

examine carefully the process by which we had gotten so committed to Vietnam."[1174] McNamara believed that there were serious deficiencies in his and the Johnson administration's decision-making processes, and he specified two of the most critical. First, McNamara believed that policy makers were, "not looking far enough ahead in assessing the consequences of our actions." Second, he faulted himself for "not laying out for the President a careful assessment of alternatives on crucial decisions."[1175] As an example of faulty "decision-habits," McNamara pointed out to Rowen that, "he had never been clear on what basis we had decided that Diem should no longer be supported; that he had never found anyone in the [U.S. government] who could give a coherent rationale for our shift on Diem." Rowen took McNamara's comments to indicate that the Vietnam study was intended principally to provide a substantial and rigorous intellectual basis for future policy decisions.

In any case, McNamara's historical study of U.S. involvement in Vietnam was fully underway by mid-summer, 1967, with the creation of a special task force. Upon the death of Assistant Secretary ISA McNaughton in an air accident in July 1967, McNamara tapped one of his closest advisors, Deputy Assistant Secretary of Defense for International Security Affairs Morton H. Halperin, to take general supervisory responsibility for the project. Halperin, in turn, selected Leslie H. Gelb, a colleague of Halperin's on the policy planning staff, to assume day-to-day direction of the study. The task force itself comprised approximately thirty-six staff members drawn from the Departments of Defense and State, the military services, universities, and policy "think tanks" including RAND and the Institute for Defense Analysis.[1176] RAND's involvement in the project began immediately when Halperin asked Henry Rowen to provide several staff members with extensive Vietnam experience. The RAND analysts requested by Halperin and assigned by Rowen to the Pentagon detail were Harvey Averch, who had spent considerable time studying Viet Cong forces in the Mekong Delta region, Melvin Gurtov, who had also worked extensively on Vietnam and Southeast Asia research, Hans Heymann, who had worked on Laos and Thailand as well as Vietnam issues, Gustave Shubert, who directed RAND's counterinsurgency research, Lt. Col. William Simons, an Air Force officer on duty at RAND and engaged in Vietnam research, and Daniel Ellsberg.[1177]

Halperin and Gelb conceptualized an extensive report, including both government documents and interpretive histories of specific topics or periods. Their initial plan called for about thirty such studies, and the final report conformed closely to this structure. As sources for their work, the task force had "total access" to the files of McNamara and Assistant Secretary of Defense for International Security Affairs John McNaughton, as well as memoranda from the Joints Chiefs of Staff, selected documents from the White House and State Department, and certain C.I.A. materials. Gustave Shubert recalled spending nearly all of his time for one year working in the Pentagon on the Vietnam history, and he described the intimate relations between the task force and the Secretary of Defense:

> As you walked into the Secretary's door, instead of turning right to go to see the Secretary, you turned left and you walked into this fairly large room in which there were people who were working and a lot of files. There were files outside; there was a Xerox machine and so on and so forth. . . . What we were trying to do was put together an objective-as-possible history of what had actually happened . . . . You know, we'd work all night, we'd work all day. We'd work in there with the demonstrations going on outside the window. This was at the height of the demonstration time. This bunch of nerds was in there working away on trying to get the true story put together which none of us, incidentally, had any reason to think would ever see the light of day.[1178]

Its job completed, the Vietnam history task force was disbanded officially in May, 1968, six months after McNamara had left the Pentagon due largely to his disenchantment with President Johnson's policies in Vietnam. At this time, most of the analytical essays had been completed and submitted to Halperin, Gelb, and a small team of Pentagon officials for final editing and organization.

The task force's final report, completed just five days before Richard Nixon's inauguration in January, 1969, was enormous—7,000 pages in length and bound into forty-seven volumes, including approximately 3,000 pages of historical narrative and 4,000 pages of government documents. The first few volumes detailed the events and policy decisions of the years 1940-1960, concentrating of U.S. policies toward Indochina, American involvement in the Franco-Viet Minh War from 1950 to 1954, and the origins of insurgency in South Vietnam from 1954 to 1960. The remaining volumes covered the years following President Kennedy's election in 1960, with four volumes devoted to the major diplomatic events of the conflict. Most observers, both at the time the study was underway and after its publication, believed that the Vietnam history contained little information or analysis that was not already in the public purview. Shubert, for example, commented that the history "no more deserved to be classified than my relations with my grandchildren."[1179]

Still, the vast study provided so much detailed material on U.S. policy making procedures and strategies, that Halperin and Gelb classified the entire study "Top Secret—Sensitive," thereby withholding it not only from the U.S. public but from nearly all government officials. Even President Johnson and his Secretary of State Dean Rusk were unaware of the extent of the project or the nature of its findings. With the election of Richard Nixon in November, 1968, Halperin and Gelb, along with Assistant Secretary of Defense Paul Warnke, were deeply concerned that the study would be destroyed by the incoming administration, and in December, 1968, they asked Henry Rowen if RAND would store in its classified facilities a set of the study volumes, some supporting documents, and some private papers of Warnke and the late Assistant Secretary of Defense-ISA John T. McNaughton. These materials were to be made available to RAND analysts engaged in Vietnam research under a specific set of conditions defined in a memorandum dated 18 December 1968 from Halperin, Gelb, and Warnke to Henry Rowen:

1. Access to post-1961 task force materials and papers required the approval of two of the three OSD officials (Halperin, Gelb and Warnke).
2. Access to the history materials dealing with the 1940-1961 period would be controlled by RAND with advance notice to Halperin, Gelb and Warnke.
3. Access to the Warnke papers required the approval of Warnke.[1180]

At that time, RAND continued to be heavily involved in Vietnam and other Southeast Asia research. Over the 1966-1971 period, RAND's commitment to Southeast Asia studies employed between 35 and 90 full-time professionals, and included the extensive Viet Cong interview program, field studies carried out in support of MACV (Military Assistance Command, Vietnam), and numerous other projects.[1181] Of particular relevance to McNamara's Vietnam history study, RAND was engaged in a "Lessons of Vietnam" research project designed to derive policy lessons from the Southeast Asia conflict. Specifically, this project, "aim[ed] at analytic generalizations in insurgent and counter-insurgent processes—mainly suggested by and tested against U.S. experience in Vietnam—which promise to be relevant to policy in Vietnam (and elsewhere) in the future."[1182] In 1969, Daniel Ellsberg charged 167 of his research days at RAND to the "Lessons of Vietnam" project.[1183]

Ellsberg's return to RAND in early 1968 coincided almost precisely with the initiation of McNamara's secret Vietnam history project, and Morton Halperin immediately invited Ellsberg to

join the task force. Over the remainder of 1967, Ellsberg spent most of his time in Washington working on his portion of the Vietnam history—a study of the Kennedy administration's 1961 Vietnam policies. However, accounts of Ellsberg's productivity on the project vary considerably. Ellsberg believes that his 350-page essay on this period survived largely intact in the final report. However, Rudenstine quotes Leslie Gelb as saying that, "very few of Ellsberg's words finally appeared."[1184] In fact, Gelb's observations are supported by Shubert, who worked with Ellsberg on the history task force. Shubert describes Ellsberg's role as more of a "gadfly critiquer" who spent considerable time reading and commenting on the work of other task force members but produced little writing himself. This style is consistent with Ellsberg's typical function at RAND where, according to Shubert, "He did a lot of talking, he had a lot of good ideas—original ideas—a lot of insight. But when it came to producing a product, there wasn't anything. . . . Sitting down, working on something, and actually finishing it was not Dan's strongest point."[1185] Over the next few years, as Ellsberg became increasingly involved in anti-war activities, these traits became magnified and his research output at RAND became a source of dismay for his managers.

Upon his return to RAND on a full-time basis in early 1968, Ellsberg took up work on the "Lessons of Vietnam" research, which was funded under the Advanced Research Projects Agency's Project AGILE. After just a few months of work, however, Ellsberg and several other RAND analysts were diverted by a request from Assistant Secretary of Defense Paul Warnke for an analysis of alternative strategies for Vietnam. Ellsberg's work on this project almost certainly marks his final conversion to opposing American involvement in Vietnam. Ellsberg's role in the Vietnam options study was the construction of the "withdrawal option," for which Ellsberg argued adamantly. When the options project concluded near the end of 1968, Ellsberg resumed his work on the Lessons project, for which he served as co-leader from January 1969 through April 1970.

To support his research on the Lessons of Vietnam, Ellsberg asked Henry Rowen for permission to move a set of the top secret Vietnam history volumes from RAND's Washington, D.C., office to Santa Monica, where he could access them. At this time, RAND held only the thirty-eight volume set—apparently a draft of part of the final report—which Rowen had agreed to store for Halperin, Gelb, and Warnke pursuant to their memorandum of 18 December 1968.[1186] This set had been delivered to RAND's Washington Office on 21 January 1969 and was the subject of special security arrangements. First, knowledge of the report's existence was limited to a handful of individuals, and access to it could be granted only by Henry Rowen after his determination of clearance, need-to-know, and authorization from two of the 18 December 1968 memorandum signatories. Second, the Vietnam history volumes and papers were separated from RAND's other classified materials, and knowledge of the vault combination was limited to the senior administrator of the Washington Office, Lawrence J. Henderson, Jr. Finally, the Vietnam history volumes and accompanying papers were not logged into RAND's Top Secret accountability system—a source of considerable controversy after the papers had been published by the New York Times. RAND's internal investigation of the circumstances surrounding the papers' publication concludes that this course was followed so as to minimize the number of people aware of the history's existence. However, this contravention of current Industrial Security Manual rules was later cited by Secretary of Defense Melvin Laird as a "deficiency" in RAND's handling of the documents.

Based on his long and trusting relationship with Ellsberg, Rowen convinced Halperin and Gelb to allow Ellsberg access to the thirty-eight volume set. Having taken pains to convince Gelb of Ellsberg's reliability, Rowen authorized Ellsberg to transport the history volumes and hold them in Santa Monica—a decision that eventually cost him his job. On 28 February 1969, Ellsberg carried ten of the thirty-eight volumes out of RAND's Washington Office and

transported them to Santa Monica. In August, 1969, Ellsberg moved a further eight volumes of this set to California, and at that point, only he and Rowen in Santa Monica knew that the volumes existed.[1187] Following his transportation of the history volumes to Santa Monica, Ellsberg maintained possession of them until 20 May 1970, when he was clearing his office prior to leaving RAND. During those months, Ellsberg did not log the eighteen volumes into RAND's Santa Monica classified control system and only he was certain of their location. Henry Rowen knew that Ellsberg possessed the documents, but available records do not indicate any efforts by him to ensure the proper storage of the documents. Officially, Ellsberg was authorized to store the volumes only in RAND's top secret control facilities or in the top secret storage container located in his office (Ellsberg was one of the few RAND staff members with a top secret container in his office). Since the documents were not logged into RAND's top secret control facility until 20 May 1970, it can be assumed that Ellsberg had continuous and unlimited access to them until that date.

While it is unclear exactly when during the fall of 1969 Ellsberg began photocopying the Vietnam history volumes, this time-consuming effort coincided with two crucial and related changes in his life: his adoption of fervent anti-war activism and the deterioration of his performance at RAND. The first of these processes is discussed at length elsewhere, but was clearly evident to Ellsberg's co-workers at RAND.[1188] As discussed above, Ellsberg was the spokesman for and apparent leader of the RAND group which submitted an anti-war letter to the editors of the New York Times in October, 1969. As Shubert comments, "There may have been two or three people in RAND who didn't know where Dan stood, but that's probably about all."[1189]

The second of these processes was agonizing for Ellsberg as well as his managers at RAND, particularly Henry Rowen, and it eventually ended in Ellsberg's termination in the spring of 1970. According to RAND records, Ellsberg's work on the Lessons of Vietnam project produced little written product, and Charles Wolf, RAND's Economics Department head, reported, "the quality of these notes [is] extremely uneven, on the average much below the quality of Ellsberg's previous work at RAND."[1190] Ellsberg was having great difficulty in completing promised research papers, perhaps due to his growing commitment to anti-war activities, and these inabilities became "the subject of many earnest and painful conversations between Ellsberg and his Department Head and Program Manager."[1191] In the spring of 1969, Wolf began setting firm production deadlines for Ellsberg, and he, Rowen, and Albert Wohlstetter, Rowen's mentor and senior advisor, met several times in mid-1969 to discuss Ellsberg's continuing failure to meet the agreed-upon deadlines. RAND records indicate that by this time, Rowen and Wohlstetter felt compelled to encourage Ellsberg's departure from RAND if the trend was not reversed. Ellsberg himself was aware of his lacking productivity, and he told Wolf and Rowen that "he was seeing an analyst and hoped that his output would be improved."[1192]

Layered on top of Ellsberg's productivity problems were the effects of his strident anti-war positions within RAND. The Vietnam War had created deep divisions within RAND, and Ellsberg's increasingly strident activism both reflected and deepened these splits. Clearly, the dissatisfaction with Ellsberg's written productivity was magnified by his unrelenting anti-war stance, and it is of significance that Ellsberg's department head, Charles Wolf, authored the public rebuttal to Ellsberg's letter to the New York Times. Furthermore, Ellsberg's activism helped to cripple Henry Rowen's attempts to rebuild RAND-Air Force relations. Rowen's close relationship with Ellsberg was well-known throughout the Pentagon as well as at RAND, and Rowen could hardly avoid being associated with Ellsberg's anti-war pronouncements. While Rowen never expressed anti-war sentiments, his relationship with Ellsberg and Ellsberg's

continued employment at RAND were evidence enough of sympathetic views for Rowen's detractors.

In a meeting with Rowen on 9 April 1970, Ellsberg suggested that his employment at RAND be terminated due to the embarrassment he was causing Rowen and because he felt inhibited by his RAND affiliation in speaking out against the war.[1193] Ellsberg had been offered a position as a Senior Research Associate at the M.I.T. Center for International Studies, so his termination could take place almost immediately. Rowen readily agreed, and Ellsberg's employment at RAND ended on 15 April 1970. Still, Ellsberg retained his status as a RAND consultant until September 1970 so that he could complete some of his unfinished research projects. By then, however, his most important project—photocopying the Vietnam history—had been completed. On 20 May 1970 Ellsberg passed the twenty volumes of the history in his possession to RAND colleague Richard Moorsteen, who immediately turned them in to the Santa Monica top secret control office.

During the second half of 1970, Ellsberg searched for a means of getting the Vietnam history into the public domain without incurring criminal liability. Ellsberg not only had lost faith in the Nixon administration's willingness to end the Vietnam conflict, but he feared that the President was about to repeat the mistakes of his predecessors by launching an escalation of American involvement. The McNamara history, he felt, would demonstrate the futility of such a strategy and thus hasten the war's conclusion. First, he approached Senators J. William Fulbright and Charles Goodell, actually passing portions of the study on to them, but neither was willing to make the study public. In January, 1971, Ellsberg approached Senator George McGovern, who had sponsored an anti-war amendment and was the first announced Democratic candidate for the 1972 Presidential election. Like Fulbright and Goodell, McGovern refused to help Ellsberg directly, but he suggested that Ellsberg contact the New York Times or the Washington Post.[1194] Finally, in mid-February, 1971, Ellsberg contacted Neil Sheehan of the New York Times, and, after a series of meetings, delivered to that paper the Vietnam history photocopies. Over the next few months Sheehan and his editors at the Times agonized over what they should (and, legally speaking, could) do with the hot potato that Ellsberg had placed in their laps. At last, on 13 June 1971, the New York Times began publishing lengthy excerpts from the Vietnam history—excerpts that quickly became known as the Pentagon Papers.

Henry Rowen's first intimation that something was amiss concerning Ellsberg and the Vietnam history came in May 1970, just a month after Ellsberg had suggested that he end his employment at RAND and more than a year before the Pentagon Papers' publication. On the 27 April, the Federal Bureau of Investigation (FBI) asked RAND's security officer to ascertain Ellsberg's presence in the RAND offices over Christmas week, 1969. The FBI had received an allegation that during December, 1969, Ellsberg had taken some classified documents out of RAND, reproduced them, and passed them on to Senators Fulbright and Goodell. RAND's security officer, Richard Best, passed these allegations on to Henry Rowen on 7 May, indicating that their source was a "family friend" of Ellsberg's ex-wife, who had learned of the activities from Ellsberg's eleven year-old son. On 23 June, Rowen and Best met with two FBI agents, who indicated that they had not been able to gain first-hand evidence supporting the allegations and that they had no indication what documents Ellsberg might have been copying. Rowen suggested that if the allegations were true, the documents might have come from "some Vietnam History materials, known as the McNamara Study, on which Ellsberg had been working."[1195] Around the time of the FBI interview, Rowen heard a second report of Ellsberg's mischief. In this case, Albert Wohlstetter reported to Rowen that RAND economist Andrew Marshall's wife had been told by the former Mrs. Ellsberg that Ellsberg's son had participated in copying classified documents during the previous winter.

Despite the seriousness of the allegation, neither Rowen nor RAND's security office took further action in the matter. On one hand, Ellsberg's employment had been terminated, and the FBI investigation appeared to be continuing (in fact, it did not). This meant that an overt investigation by RAND into the matter might interfere with the FBI efforts. However, despite the allegations, Rowen permitted Ellsberg continued access to the RAND facility and to classified documents for the duration of his consulting contract, which ran until 30 September 1970. It may be that Rowen hesitated to cut off Ellsberg's access based on a "fifth-hand rumor passed by an eleven year old child to a bitterly disaffected ex-wife" for fear of appearing to persecute one of RAND's most vocal anti-war activists.[1196] More likely, Rowen's enduring friendship with Ellsberg prevented him from grasping the depth of Ellsberg's misconduct and its potential consequences for his own tenure at RAND. Looking back on the situation many years later, Rowen commented, "What I hadn't realized was that Ellsberg had really sort of flipped."[1197] In any case, neither RAND nor the FBI made further inquiries regarding the allegations until after Ellsberg's leak began appearing in the papers.

On 13 June 1971, a pleasant Sunday morning in Los Angeles, Henry Rowen picked up his copy of the New York Times and, to his horror, was confronted by published excerpts of McNamara's top secret Vietnam history. For Rowen, the irony was suffocating. In 1967, Rowen had been one of the earliest people to suggest to the Secretary of Defense that he commission a study of American involvement in Vietnam.[1198] Within minutes of reading the Times excerpts, Rowen had put together the pieces of Ellsberg's duplicity. Rowen immediately telephoned Henry Kissinger and informed Kissinger of his strong suspicions as to the story's source. A few hours later, Shubert and Wohlstetter joined Rowen in Rowen's office at RAND. In fact, no one knew for sure that Ellsberg was the source, but, according to Shubert, Rowen "kept mumbling and grumbling that it had to be Ellsberg. It's got to be Dan; he must have done it."[1199] Wohlstetter, furious to the point of profanity at what he perceived to be the treachery of his protégé, exclaimed, "This has Dan's hand all over it!"[1200] Throughout the day, Rowen's office telephone rang ceaselessly as the rumor spread that Ellsberg, and thus RAND, had been the source of the published excerpts.

For Rowen, Ellsberg's action was the deepest of betrayals, since Rowen instantly realized that his presidency at RAND could not survive the Pentagon Papers debacle. Ellsberg recognized the depth of his treachery in his memoir of the events:

> Our [New York Times] letter didn't get [Rowen] fired as president of Rand . . . but my later release of the Pentagon Papers . . . essentially did. The thought that I was going to do this to my closest friend was the most anguishing consideration I faced throughout the process of getting out the papers.[1201]

Indeed, for several months after the Times publication, it was not clear that RAND itself would survive. The Air Force immediately seized control of RAND's top secret control facilities and undertook a thorough review of the corporation's security procedures. Upon learning of RAND's role in the leak, a livid President Nixon ordered the immediate termination of all of RAND's federal contracts.[1202] John Erhlichman, one of Nixon's chief advisors, took the order but, understanding his boss' furious temper, took no action on the matter. In the meantime, all of RAND's resources and contacts were pressed into damage control action. Rowen himself hastened to Washington as did board chairman Newton Minow and former chairman David Shepard, meeting with anyone who would see them and hear RAND's side of the story. In the end, the storm passed over RAND, leaving in its wake only one body.

RAND's board chairman, Newton Minow, acted swiftly following the Pentagon Papers' publication. Once it was ascertained that Ellsberg was the source of the papers, Minow informed Gustave Shubert that, going forward, Minow would be assuming direct control of RAND, and Shubert would be his lieutenant. Rowen was immediately and unceremoniously relieved of his authority, and all of RAND's officers were required to tender their resignations so that the board would have full freedom of action. While at RAND no one seems to have suspected Rowen of complicity in the leak, many people believed that Rowen's friendship with Ellsberg had made the leak possible. Furthermore, Rowen's failure to terminate Ellsberg's access to classified materials despite numerous warning signs was perceived as an appalling error in judgment. The board's principal goal was to ensure RAND's survival, and Rowen's unambiguous sacrifice made clear RAND's determination to resolve the matter and carry on. According to Shubert, "Harry was very angry, as you could imagine, that the board in general showed him no sympathy . . . . He was angry at the chairman, no matter who it was—it happened to be Minow— for not giving him support. He had no support."[1203]

Within weeks, RAND's board met at the Beverly Wilshire Hotel, and only James Gaither, Jr., RAND's counsel, spoke in Rowen's defense. Most of RAND's trustees were in favor of Rowen's immediate termination, but Gaither argued that such treatment for a man who had devoted much of his life to RAND would be utterly dishonorable. For the sake of appearances, Rowen was permitted to remain in RAND's presidency, but he retained no real power. At their November, 1971, meetings, RAND's board announced that Rowen would retire from RAND in eighteen months or as soon as a successor could be identified. To avoid any concerns that Rowen would be exercising presidential authority, however, RAND's announcement also reported that during Rowen's remaining months vice president of administration J. R. Goldstein would be "Acting President."[1204] The Rowen era at RAND—five years of intense activity and remarkable change—was thus closed. RAND had now to find the means of healing the wounds opened during those years and of leveraging the opportunities Rowen's administration had created.

The Search for Stability

To chart a course into the post-Rowen era, RAND's board in August, 1971, appointed a special committee of trustees and visiting experts to determine "how RAND can best serve national security and other needs in the future."[1205] The board committee was chaired by trustee Charles Zwick, who named Harold P. Smith, the chairman of the Applied Sciences Department of the University of California-Davis, to act as staff director. In mid-September, the Zwick committee held a meeting with Deputy Secretary of Defense David Packard, Director of Defense Research and Engineering John Foster, Secretary of the Air Force Robert C. Seamans, and J. Fred Buzhardt to discuss RAND's future. Deputy Secretary Packard opened the meeting by saying that, with the actions taken by RAND's board since the Pentagon Papers' publication, he was convinced that the Department of Defense would continue to need RAND's services. Specifically, he assured the Zwick committee members that, "repercussions from the Ellsberg affair are over the hump."[1206] Furthermore, Packard told the RAND representatives that the budget "ceiling" situation that had created such problems for RAND since 1965 might soon be alleviated. While an overall spending ceiling might remain, he expected the Secretary of Defense to be given authority to alter the budget allocations under that departmental cap. Thus, he recommended that RAND not pursue any organizational restructuring intended to circumvent the ceiling.

With this good news, Harold Smith took up nearly full time residence at RAND and began analyzing "almost all aspects of RAND." Specifically, Smith and his committee looked at

RAND's research agenda, research productivity and quality, RAND's balance of skills, the mixture of basic versus applied research, client relationships, and staff morale.[1207] To support Smith's work, RAND's program managers and department heads assembled extensive reports on RAND's national security and domestic programs, as well as general assessments of the issues listed above. Significantly, while RAND's records indicate that Smith and his staff met with a wide range of program managers, department heads, project leaders, and analysts, there is no evidence that they consulted with Henry Rowen.

The Zwick committee presented its findings to RAND's board at their November, 1971, meetings. Most importantly, the committee recommended against creating separate corporations to house RAND's various research efforts, especially the defense and domestic programs. They found, "The needs for intellectual coherence are greater now, not less."[1208] The Zwick committee did, however, recommend a series of less drastic organizational changes including a reduction in the number of research departments, reconstitution of the corporation's management committee, and revitalization of RAND's joint trustee/management executive committee.

With regard to RAND's research output, the Zwick committee found the quality of RAND's work to be good relative to its peers, but they recommended more extensive use of external reviewers for advice on research quality and relevance. The committee offered its concern that the number of "world-shakers", or pathbreaking research efforts, was in decline at RAND, and that there had been significant erosion in RAND's mathematics, physical sciences and engineering capabilities. In general, the Zwick committee provided a concise starting agenda for Henry Rowen's successor.

Indeed, it did not take long for RAND's board to identify that successor. Principally, the board set its sights on candidates with impeccable national security credentials, productive experience with the military services, and "no baggage." According to Shubert, "They didn't want anyone who had been here who could in any way be tainted by having been associated" with Rowen and his administration.[1209] By the time of their April, 1972, meetings, RAND's board had found just such a candidate—Donald Rice. Rice was thirty-two years old when he accepted RAND's presidency in April, 1972, and had been serving as Richard Nixon's Assistant Director of the Office of Management and Budget since September, 1970. Rice had earned a Ph.D. in Economics, specializing in quantitative management methods, at Purdue University in 1965, after which he became an Assistant Professor of Management at the Naval Postgraduate School. In 1967, Rice moved over to the government, assuming the directorship of Cost Analysis in the Office of the Assistant Secretary of Defense for Systems Analysis. With these credentials, Rice fit well both RAND's research culture and its needs for fresh, effective leadership.

As Rice moved into RAND's presidency, one Air Force observer told Business Week, "RAND is not in good health, and the prognosis is uncertain."[1210] In fact, the uninterrupted budget cuts in RAND's national defense research programs had crippled morale in those areas and caused an exodus of key research personnel. During the first six months of 1972 alone, RAND lost a department head, its research leaders in laser technology, sea-based forces and Soviet Defense technology, and an entire research team devoted to man-machine computer systems, who left RAND to establish an institute under the auspices of the University of Southern California.[1211] To stem the tide of defense funding cuts, Rice remained in the Washington area during his first few months in office, spending most of his time rebuilding RAND's relationships with key military and civilian officials.

Upon arriving in Santa Monica, Rice embarked on a limited reorganization of RAND's operating structure along the lines recommended by the Zwick committee. Without creating separate legal entities, Rice formed three operating divisions that corresponded with RAND's principal research efforts: Air Force, national security, and domestic programs. George Tanham

remained vice president in charge of RAND's Washington Office with the added duty of the Project RAND (Air Force) Division manager; John P. White was appointed a new vice president in charge of the National Security/OSD Division; and Gustave H. Shubert was made vice president in charge of the Domestic Programs Division. Furthermore, while Henry Rowen's matrix organization structure was maintained, greater authority was returned to the department heads, and the dimensions of the matrix were reduced by cutting the number of departments and programs.

Over these early months, Rice also worked vigorously to restructure RAND's defense research program such that it meshed with Air Force and Department of Defense needs. As a result of these exertions, RAND's relations with the Air Force survived a critical showdown at the November, 1972, RAND-AFAG meetings and began to improve. Air Force vice chief of staff Grant Hansen left Washington for the November AFAG meetings in Santa Monica intent on cutting the Project RAND budget severely, fully realizing that such a cut probably would kill the project. Hansen and other top Air Force officials no longer felt that RAND's responsiveness to Air Force needs justified the risk of further investment. The situation was so grim that, in the weeks before the November meetings, Director of Defense Research and Engineering John Foster thought Project RAND was "a goner."[1212] However, Rice's carefully orchestrated presentation of his revamped Project RAND program changed Hansen's mind. Reporting on the meetings to Foster, AFAG, "conceded that RAND has been most responsive to the Air Force during the past year, and that the research program was structured in accordance with Air Force requirements."[1213] Hansen then recommended a "stability" budget figure for Project RAND, and a vital corner finally had been turned in RAND's Air Force relations.

Indeed, after more than a decade of upheaval, the RAND Corporation at last entered a period of relative stability in 1972. Although Donald Rice did not share fully Henry Rowen's commitment to social welfare research, Rice recognized the importance of RAND's diversification to the organization's long-term health. Under Rice's guidance, continuing growth in the RAND's domestic policy programs offset weakness in defense funding throughout the 1970s, and by the end of the decade RAND's social welfare and defense research efforts were approximately equal in size. During these years, RAND undertook its extensive national Health Insurance Experiment, established the Institute for Civil Justice—a policy center dedicated to systematic analysis of the legal system—and expanded internationally by undertaking water control and flooding research jointly with the Dutch government. At the same time, RAND's national defense research concentrated on matters of practical application, such as the survivability of tactical air forces, military personnel management practices, and the implications of advanced technologies.

In retrospect, RAND's wrenching diversification into social welfare policy analysis proved a remarkably successful strategy. Although RAND remained the archetypical Cold War think tank in the late 1980s, the end of the Cold War did not bring an end to RAND. Instead, the often counter-cyclical social welfare and national security research personalities brought new balance to the organization. Under the guidance of James A. Thomson, Rice's successor as RAND's president in 1989, and Michael Rich, who took over from Thomson in 2011, RAND has achieved a new golden age. Twenty-five years after the fall of the Soviet Union, RAND's policy research franchise is, if anything, stronger and more influential than ever. At the climax of the Cold War, in 1989, the corporation's annual revenues had grown to approximately $94 million (about $175 million in 2012) with Project RAND (renamed Project Air Force in 1976) making up 26 percent of revenues, Army research 22 percent, other national defense research 29 percent, and domestic programs 22 percent.[1214] In that year, RAND's employment reached a record level with 606 professional researchers, another 526 support staff members, and 318 consultants. By 2012,

however, RAND's revenues reached an astounding $265 million, 49% of which was provided by national security agencies including 16% from the U.S. Air Force. Of the 1,700 people working at RAND, 67 percent or over 1,100 hold a Ph.D. In 2004, the corporation moved from its aging offices built in the 1950s and 1960s to a new headquarters facility constructed on an adjacent property. The Santa Monica headquarters are now complemented by U.S. locations in Arlington, VA, Pittsburgh, PA, and Boston, MA, New Orleans, LA, and Jackson, MS, as well as offices in the UK, Belgium, and Qatar. For better or worse, the policy analysis tools and techniques forged at RAND to fight the Cold War are today embedded within virtually every policy debate – military or otherwise – throughout the world.

Back to Table of Contents

Endnotes

Chapter 1

[1]Memorandum, L. J. Henderson to F. R. Collbohm, "Discussion with Fred Stephan Concerning the McGraw-Hill Series and RAND Social Science," 2 November 1949, RAND Classified Library, Folder "History, Henderson 1949."

[2]With regard to the consensus among civilian and military leaders concerning the decisive nature of research and development, see James Phinney Baxter, Scientists Against Time (Boston: Little, Brown, 1946). For scholarship concerning the formulation of U.S. science policy in the years immediately following World War II, see Vannevar Bush, Science the Endless Frontier: A Report to the President (Washington, DC: U.S. Government Printing Office, 1945); U.S. Senate, Committee on Military Affairs, Subcommittee on War Mobilization. The Government's Wartime Research and Development, 1940-1944. (Washington, D.C.: U.S. Government Printing Office, 1945); Talcott Parsons, "The Science Legislation and the Role of the Social Sciences," American Sociological Review 11 (Dec. 1946): 563-666; Perry McCoy Smith, The Air Force Plans for Peace, 1943-1945 (Baltimore: The Johns Hopkins University Press, 1970); Daniel J. Kevles, "The National Science Foundation and the Debate over Postwar Research Policy, 1942-1945: A Political Interpretation of Science- The Endless Frontier," Isis 68 (1977): 5-26; Daniel J. Kevles, The Physicists: The History of a Scientific Community (Cambridge: Harvard University Press, 1987; originally published: New York: Knopf, 1977), pp. 340-348; Gregg Herken, The Winning Weapon: The Atomic Bomb in the Cold War, 1945-1950 (New York: Knopf, 1980); Daniel J. Kevles, "Principles and Politics in Federal R&D Policy, 1945-1990: An Appreciation of the Bush Report," introduction to 1990 reissue of Vannevar Bush, Science the Endless Frontier (Washington DC: National Science Foundation, 1990); and Daniel Lee Kleinman, Politics on the Endless Frontier: Postwar Research Policy in the United States (Durham: Duke University Press, 1995). For an analysis of the Soviet experience, see David Holloway, Stalin and the Bomb: The Soviet Union and Atomic Energy, 1939-1956 (New Haven: Yale University Press, 1994).

[3]This historical interpretation is most extensively expressed in the essays collected in Peter Galison and Bruce Hevly, eds., Big Science: The Growth of Large-Scale Research (Stanford: Stanford University Press, 1992).

[4]See Michael A. Dennis, "A Change of State: The Political Cultures of Technical Practice at the M.I.T. Instrumentation Laboratory and the Johns Hopkins University Applied Physics Laboratory, 1930-1945," Ph.D. diss., Johns Hopkins University, 1990.

[5]On the Manhattan Project see Leslie R. Groves, Now It Can Be Told: The Story of the Manhattan Project (New York and Evanston: Harper & Row, 1962); Richard G. Hewlett and Oscar E. Anderson, Jr., The New World: A History of the United States Atomic Energy Commission, Volume I, 1939-1946 (Berkeley: University of California Press, 1990; originally published University Park: Pennsylvania State University Press, 1962); Richard Rhodes, The Making of the Atomic Bomb (New York: Simon and Schuster, 1986); and Barton C. Hacker, The Dragon's Tail: Radiation Safety in the Manhattan Project, 1942-1946 (Berkeley: University of California Press, 1987).

[6]This point is expressed in much of the literature concerning the formation of American science policy in the post-World War II era (see note 6). See also, Herbert F. York, The Advisors: Oppenheimer, Teller, and the Superbomb (Stanford, CA: Stanford University Press, 1976); and Michael Sherry, Preparing for the Next War: American Plans for Postwar Defense (New Haven: Yale University Press, 1977).

[7]For accounts of RAND's incorporation, see Bruce L. R. Smith, The RAND Corporation: Case Study of a Nonprofit Advisory Corporation (Cambridge, MA: Harvard University Press, 1966), pp. 56-92; and Fred M. Kaplan, The Wizards of Armageddon (New York: Simon and Schuster, 1983), pp. 60-62.

[8]For scholarship on RAND's role in the development of computer science and artificial intelligence, see Allen Newell and Herbert A. Simon, "Historical Addendum," Human Problem Solving (Englewood Cliffs, N.J.: Prentice-Hall, 1972); F. J. Gruenberger, "History of the Johnniac," Annals of the History of Computing 1, no. 1 (1979): 49-64; Pamela McCorduck, Machines Who Think (San Francisco: W. H. Freeman and Company, 1979); C. L. Baker, "JOSS Johnniac Open-Shop System," in R. L. Wexelblat, ed., History of Programming Languages (New York: Academic Press, 1981); James Fleck, "Development and Establishment in Artificial Intelligence," in Norbert Elias, Herminio Martins, and Richard Whitley, eds., Scientific Establishments and Hierarchies, vol. 6 of Sociology of the Sciences: A Yearbook (Boston: D. Reidel Publishing Company, 1982); Shirley L. Marks, "JOSS: Conversational Computing for the Nonprogrammer." Annals of the History of Computing 4, 1 (1982): 35-52; George Bernard Dantzig, Impact of Linear Programming on Computer Development, Technical Report SOL 85-7 (Stanford, CA: Systems Optimization Laboratory, 1985); Gwen Bell and Leah Hutten, "A Historical Timeline of Artificial Intelligence and Robotics," Computer Museum Report, (Boston: The Computer Museum, 1987); Martin Davis, "Mathematical Logic and the Origin of Modern

Computers," in E. Phillips, ed., Studies in the History of Mathematics (Washington, D.C.: Mathematical Association of America, 1987); Herbert A. Simon, Models of My Life (New York: Basic Books, 1991); and Daniel Crevier, AI: The Tumultuous History of the Search for Artificial Intelligence (New York: Basic Books, 1993). For discussions of RAND's participation in early space studies, see R. Cargill Hall, "Early U.S. Satellite Proposals," Technology and Culture 4 (Autumn 1963): 410-434; Robert E. Bickner, The Changing Relationship between the Air Force and the Aerospace Industry (Santa Monica: The RAND Corporation, 1964); Edmund Beard, Developing the ICBM: A Study in Bureaucratic Politics (New York: Columbia University Press, 1976); Walter McDougall, . . . the Heavens and the Earth: A Political History of the Space Age (New York: Basic Books, 1985); David H. DeVorkin, Science with a Vengeance: How the Military Created the U.S. Space Sciences after World War II (New York: Springer-Verlag, 1992); and Davis Dyer, "Necessity as the Mother of Convention: Developing the ICBM, 1954-1958," paper presented at the Business History Conference, Boston, Massachusetts, March 19, 1993.

[9]RAND was the organizational parent of System Development Corporation and Analytic Services, Inc. (ANSER) and is argued by many scholars to have been the model for the preponderance of Cold War nonprofit research organizations. See "RAND: R&D Nonprofit Pioneered a New Kind of Organization, Served as a Model for Others," Science 144 (29 May 1964): 1113-1114, 1164; Claude Baum, The Systems Builders: The Story of SDC (Santa Monica, CA: Systems Development Corporation, 1981); Paul Dickson, Think Tanks (New York: Atheneum, 1971); and James Allen Smith, The Idea Brokers: Think Tanks and the Rise of the New Policy Elite (New York: The Free Press, 1991). RAND researchers seem to have taken special pride in the attention given their organization in the Soviet press. Soviet press articles accusing RAND of a variety of nefarious activities were regularly translated and circulated among the RAND staff. For example, see Yu Ovsyannikov, "War Proves RAND Corporation Miscalculated," (in Russian excerpted from Pravda Ukrainy), Foreign Broadcast Information Service-Daily Report no. 215 (November 1, 1968).

[10]See Fred M. Kaplan, The Wizards of Armageddon (New York: Simon and Schuster, 1983); and Gregg Herken, Counsels of War (New York: Knopf, 1985). See also, Marc Trachtenberg, "Strategic Thought in America, 1952-1966," in idem., Writings on Strategy, 1961-1964, and Retrospective (New York: Garland Press, 1988): 443-484.

[11]RAND's first large-scale research project concerned space systems and resulted in an extensive report titled, Preliminary Design of an Experimental World-Circling Spaceship, Project RAND Report SM-11827 (Santa Monica: Project RAND, 2 May 1946). For an account of RAND's role in the early U.S. space program, see Merton E. Davies, RAND's Role in the Evolution of Balloon and Satellite Observation Systems and Related U.S. Space Technology (Santa Monica: RAND Corporation, 1988).

[12]Operations research is also known, especially in Great Britain, as operations analysis. The term "operations research " is used here but is understood to be synonymous with operations analysis. For accounts of the origins of operations research, see C. West Churchman, Russell L. Ackoff, and E. Leonard Arnoff, Introduction to Operations Research (New York: John Wiley, 1957); Donald W. Mitchell, "Military Operations Research," Marine Corps Gazette 41, no. 2 (1957): 47-51; L. Edgar Prina, "The Navy First Used Think Tanks During World War II," Armed Forces Journal 106, no. 4 (September 28, 1968):18-23; and William Brett, Emile B. Feldman and Michael Sentlowitz, An Introduction to the History of Mathematics, Number Theory, and Operations Research. (New York: MSS Information Corporation, 1974). Robin Rider of Stanford University is currently writing a history of operations research.

[13]See Robert Dorfman, Paul A. Samuelson, and Robert M. Solow, Linear Programming and Economic Analysis (New York: McGraw-Hill, 1958); George Bernard Dantzig, Linear Programming and Extensions (Princeton: Princeton University Press, 1965); Robert McQuie, "Military History and Mathematical Analysis, Military Review 50, no. 5 (1970): 8-17; George Bernard Dantzig, "Time-Staged Methods in Linear Programming: Comments, Early History, Future Prospects," Large Scale Systems, Studies in Management Science Systems 7 (Amsterdam: North Holland, 1980); George Bernard Dantzig, "Reminiscences about the Origins of Linear Programming," Operations Research Letters 1, no. 2 (1981): 43-48; Robert Dorfman, "The Discovery of Linear Programming," Annals of the History of Computing 6 (1984): 283-295; Donald J. Albers and Constance Reid, "An Interview with George B. Dantzig: The Father of Linear Programming." The College Mathematics Journal 17 (1986): 293-314; and George Bernard Dantzig, Origins of the Simplex Method, Technical Report SOL 87-5 (Stanford, CA: Systems Optimization Laboratory, 1987).

[14]See Richard Bellman, Dynamic Programming and Modern Control Theory (New York: Academic Press, 1965).

[15]John von Neumann and Oskar Morgenstern, Theory of Games and Economic Behavior (Princeton: Princeton University Press, 1947). For the history of game theory, see R. Duncan Luce and Howard Raiffa, Games and Decisions: An Introduction and Critical Survey (New York: John Wiley, 1957); Steven J. Brams, Superpower Games (New Haven: Yale University Press, 1985); Eric Rasmusen, Games and Information: An Introduction to Game Theory (Oxford: Basil Blackwell, 1989); Ken Binmore, Essays on the Foundations of Game Theory (Oxford: Basil Blackwell, 1990); William Poundstone, Prisoner's Dilemma (New York: Doubleday, 1992); and E. Roy Weintraub, ed., Toward a History of Game Theory (Durham, NC: Duke University Press, 1992).

[16]On the development of systems analysis, see Olaf Helmer, Social Technology (New York: Basic Books, 1966); C. West Churchman, The Systems Approach (New York: Delacorte Press, 1968); Guy Black, The Application of Systems Analysis to Government Operations (New York: Frederick A. Praeger, 1968); E. S. Quade and W. I. Boucher, eds., Systems Analysis and Policy Planning (New York: American Elsevier, 1968); and Seth Bonder, "Systems Analysis: A Purely Intellectual Activity." Military Review 51, no. 2 (1971): 14-23. The RAND Corporation archives also appear to contain considerable materials on the origins and development of systems analysis. For example, see James F. Digby, "Operations Research and Systems Analysis at RAND, 1948-1967," RAND Note 2936-RC, April 1989.

[17]See Harold Orlans, The Nonprofit Research Institute: Its Origins, Operation, Problems, and Prospects (New York: McGraw-Hill, 1972); Daniel Guttman and Barry Willner, The Shadow Government: The Government's Multi-Billion-Dollar Giveaway of Its Decision-Making Powers to Private Management Consultants, "Experts," and Think Tanks (New York: Pantheon, 1976); James Allen Smith, The Idea Brokers: Think Tanks and the Rise of the New Policy Elite (New York: The Free Press, 1991); and David M. Ricci, The Transformation of American Politics: The New Washington and the Rise of Think Tanks (New Haven: Yale University Press, 1993). The literature on the role of scientists in the formulation of American public policy after World War II is large. See bibliography for relevant citations.

[18]James Allen Smith, The Idea Brokers: Think Tanks and the Rise of the New Policy Elite (New York, 1991), xiv. Smith's book is an excellent overview of think tanks and their role in policy formulation in post-World War II America. His interpretation of RAND is based to a large degree on the works, cited in notes below, by Bruce Smith, Fred Kaplan, and Gregg Herken. These works--and consequently Smith's book--interpret RAND largely through the history of its famous basing study led by Albert H. Wohlstetter. Although this study was highly influential in RAND's success during the 1950s, its history conveys only a tiny fraction of RAND's work--something comparable to describing an elephant based only on knowledge of its tail.

[19]Ibid., 115-6.

[20]See Bernard Brodie, Strategy in the Missile Age (Princeton: Princeton University Press, 1959); Thomas C. Schelling, The Strategy of Conflict (Cambridge: Harvard University Press, 1960); Thomas C. Schelling, Arms and Influence (New Haven, CT: Yale University Press, 1966); Michael Armacost, The Politics of Weapons Innovation: The Thor-Jupiter Controversy (New York, 1969); Lawrence Martin, ed. Strategic Thought in the Nuclear Age (London: Heinemann, 1979); Lawrence Freedman, The Evolution of Nuclear Strategy (New York: Macmillan, 1982); Marc Trachtenberg, "Strategic Thought in America, 1952-1966," in idem., Writings on Strategy, 1961-1964, and Retrospective (New York: Garland Press, 1988): 443-484; David Goldfischer, The Best Defense: Policy Alternatives for U.S. Nuclear Security from the 1950s to the 1990s (Ithaca, NY: Cornell University Press, 1993); and Carl H. Builder, The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force (New Brunswick, NJ: Transaction Publishers, 1994).

[21]This process and its perils are described in Irving Lewis Horowitz, The Rise and Fall of Project Camelot: Studies in the Relationship between Social Science and Practical Politics (Cambridge, MA: The M.I.T. Press, 1967).

[22]The growing emphasis on social analysis in RAND's national security research during the early 1960s is perhaps best reflected in the extensive studies performed at RAND concerning the conflicts in Southeast Asia and, particularly, by its "motivation and morale" studies, which analyzed the Viet Cong movement. This research program is discussed in detail in Chapter Five.

[23]The usefulness of systems analysis methods for public policy analysis was the subject of considerable debate during the late 1960s and 1970s. See for example, Simon Ramo, Cure for Chaos: Fresh Solutions to Social Problems through the Systems Approach (New York: Iland McKay, 1969); Grace J. Kelleher, ed., The Challenge to Systems Analysis: Public Policy and Social Change (New York: John Wiley, 1970); E. S. Quade, "Pitfalls of Systems Analysis," in idem. Analysis for Military Decisions: The RAND Lectures on Systems Analysis (New York: American Elsevier, 1970); and Ida R. Hoos, Systems Analysis in Public Policy: A

Critique, revised edition (Berkeley, CA: University of California Press, 1983; originally published Berkeley, CA: University of California Press, 1972).

[24]For scholarship concerning the nature of American science policy during the Cold War, see Eugene B. Skolnikoff, Science, Technology and American Foreign Policy (Cambridge: The M.I.T. Press, 1967); John M. Logsdon, The Decision to Go to the Moon: Project Apollo and the National Interest (Cambridge, MA: The M.I.T. Press, 1970); Herbert F. York and G. Allen Greb, "Military Research and Development: A Postwar History," Bulletin of the Atomic Scientists 33, no. 1 (January 1977): 12-77; Harvey Sapolsky, "American Science and the Military: The Years Since the Second World War," in Nathan Reingold, ed., Sciences in the American Context: New Perspectives (Washington, DC: Smithsonian Institution Press, 1979); Barbara B. Clowse, Brainpower for the Cold War: The Sputnik Crisis and the National Defense Education Act of 1958 (Westport, CT: Greenwood Press, 1981); Jeffrey K. Stine, A History of Science Policy in the United States, 1940-1985, Science Policy Background Report No. 1, Task Force on Science Policy, House Committee on Science and Technology (Washington, DC: U.S. Government Printing Office, 1986); Bruce L. R. Smith, American Science Policy Since World War II (Washington, DC: Brookings Institute, 1990); and Arnold Thackray, ed., Science After '40, special issue of Osiris second series 7 (1992).

[25]See Paul Forman, "Behind Quantum Electronics: National Security as Basis for Physical Research in the United States, 1940-1960," Historical Studies in the Physical and Biological Sciences 18, no.1 (1985): 149-229; Rebecca Sue Lowen, "Exploiting a Wonderful Opportunity: Stanford University, Industry and the Federal Government," Ph.D. diss., Stanford University, 1990; and Stuart W. Leslie, The Cold War and American Science: The Military-Industrial-Academic Complex at M.I.T. and Stanford (New York: Columbia University Press, 1993).

[26]Roger Geiger, review of The Cold War and American Science: The Military-Industrial-Academic Complex at M.I.T. and Stanford by Stuart W. Leslie, Technology and Culture 35, no. 3: 629-631.

[27]Works in this vein include Daniel Kevles, "Cold War and Hot Physics: Science, Security, and the American State, 1945-1956," Historical Studies in the Physical and Biological Sciences 20, no. 2 (1990): 239-264; Roger Geiger, "Science, Universities, and National Defense, 1945-1970," Osiris second series 7 (1992): 26-48); and Roger Geiger, Research and Relevant Knowledge: American Research Universities Since World War II (New York: Oxford University Press, 1993).

Chapter 2

[28]Project RAND First Quarterly Report, RAND Publication RA-15000, June 1946.

[29]For example, one of RAND's pioneering staff members, Olaf Helmer, had been strongly influenced by the "unity of science" movement during his graduate studies in Germany and the United States, and he viewed Project RAND's work as consonant with this movement. See Collins, "Planning for Modern War," p. 241.

[30]Arthur E. Raymond (1899-); RAND consultant, 1953-; engineer, chief engineer, and vice president of engineering, Douglas Aircraft Company, 1925-60. For biographical information, see and Who's Who in America, 37th ed., 1972-1973 (Chicago: Marquis Who's Who, 1972); and Who? Me? Autobiography of Arthur E. Raymond (Santa Monica: Arthur E. Raymond, 1974).

[31]Franklin R. Collbohm (1907-1990); RAND director, 1948-56, and president, 1956-67; assistant to the vice president of engineering, Douglas Aircraft Co., 1942-48; member, Office of Scientific Research and Development, 1944-45. For biographical information, see Obituary, New York Times Biographical Service, vol. 21 (February 1990), 159; and Obituary, New York Times, 14 February 1990, B-5.

[32]Edward L. Bowles (1897-1990); professor, Massachusetts Institute of Technology, 1920-90; consultant, U.S. Army Air Forces, 1943-44; scientific consultant, U.S. Air Force, 1947-51; scientific warfare advisor, Office of the Secretary of Defense, Weapons Evaluation Group, 1950-52; numerous government and industry advisory positions.

[33]Fred Kaplan, The Wizards of Armageddon (Stanford: Stanford University Press, 1983), 56-57.

[34]Ibid., 57. See also, Martin J. Collins, "Planning for Modern War: RAND and the Air Force, 1945-1950," Ph.D. diss., University of Maryland, 1998, pp. 68-70.

[35]Draft statement by Frank R. Collbohm, 12 April 1954, Folder Miscellaneous (History of RAND), L.J. Henderson Papers, Miscellaneous Box, RAND Archives, p. 1.

[36]For a history of air power theory, see Carl H. Builder, The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force (New Brunswick: Transaction Publishers, 1996.

[37]Address by Henry Arnold at Air Force Day Dinner, 1 August 1945, p.2, File Arnold Talks, Box 3, E. Bowles Papers, NASM. Quoted in Collins, "Planning for Modern War," pp. 54-55.

[38]Summary Notes on Telephone Discussion with Robert Lovett, Oct. 29, 1958, Folder Miscellaneous (History of RAND), L.J. Henderson, Jr., Miscellaneous Box, RAND Archives.

[39]See Collins, "Planning for Modern War," pp. 27-31.

[40]For a history of this group, see Thomas A. Sturm, The USAF Scientific Advisory Board: Its First Twenty Years, 1944-1964, (Washington, D.C.: G.P.O., 1967).

[41]Vaughn D. Bornet, "Douglas Aircraft, 1945-48: RAND's First Home," RAND Document D-19037, July 1, 1969.

[42]For a history of industrial research and development in the United States, see David A. Hounshell, "The Evolution of Industrial Research in the United States," in Richard S. Rosenbloom and William J. Spencer, eds. Engines of Innovation: U.S. Industrial Research at the End of an Era (Cambridge: Harvard Business School Press, 1996). For case studies of industrial research and development strategies, see David A. Hounshell and John Kenly Smith, Jr., Science and Corporate Strategy: DuPont R&D, 1902-1980 (New York: Cambridge University Press, 1988); Reese V. Jenkins, Images and Enterprise: Technology and the Ameircan Photographic Industry, 1839-1925 (Baltimore: The Johns Hopkins University Press, 1975); Ronald Kline, "The Origins of Industrial Research at the Westinghouse Electric Company, 1886-1922," paper presented at the Annual Meeting, Society for the History of Technology, 20 October 1986; Stuart W. Leslie, Boss Kettering: Wizard of General Motors (New York: Columbia University Press, 1983); Leonard S. Reich, The Making of American Industrial Research: Science and Business at GE and Bell, 1876-1926 (New York: Cambridge University Press, 1985); and George Wise, Willis R. Whitney, General Electric, and the Origins of U.S. Industrial Research (New York: Columbia University Press, 1985).

[43]David A. Hounshell and John Kenly Smith, Jr., Science and Corporate Strategy: DuPont R&D, 1902-1980 (New York: Cambridge University Press, 1988), pp. 223-274.

[44]Vannevar Bush, Science the Endless Frontier: A Report to the President (Washington, DC: U.S. Government Printing Office, 1945).

[45]Collins, "Planning for Modern War," p. 55.

[46]Ibid., p. 81.

[47]The following depiction of Project RAND's early characteristics is taken from Letter, Edward L. Bowles to Secretary of War Patterson, 4 October 1945, RAND Archives; Letter, Edward L. Bowles to Assistant Secretary of War for Air Symington, 26 November 1946, RAND Archives; Summary Notes on Telephone Discussion with Robert Lovett, Oct. 29, 1958, Folder Miscellaneous (History of RAND), L.J. Henderson, Jr., Miscellaneous Box, RAND Archives; and Draft Statement, Frank R. Collbohm, 12 April 1954, Folder Miscellaneous (History of RAND), L.J. Henderson Papers, Miscellaneous Box, RAND Archives.

[48]Letter, Edward L. Bowles to Assistant Secretary of War for Air Symington, 26 November 1946, RAND Archives, p. 1.

[49]Draft Statement, Frank R. Collbohm, 12 April 1954, Folder Miscellaneous (History of RAND), L.J. Henderson Papers, Miscellaneous Box, RAND Archives, p. 4.

[50]Frank R. Collbohm, interview with Martin Collins and Joseph Tatarewicz, 28 July 1987, Palm Desert, CA, RAND Archives, p. 17.

[51]Draft statement by Frank R. Collbohm, 12 April 1954, Folder Miscellaneous (History of RAND), L.J. Henderson Papers, Miscellaneous Box, RAND Archives, p. 4; Letter, Edward L. Bowles to Secretary of War Patterson, 4 October 1945, RAND Archives. Wright Field was the headquarters of the Air Technical Services Command, the command responsible for Army Air Forces research, development, and procurement operations. The separation of Project RAND from ATSC created considerable friction within the service, and required organization innovations such as the creation of a new Deputy Chief of Staff for Research and Development.

[52]Letter, Edward L. Bowles to Secretary of War Patterson, 4 October 1945, RAND Archives, p. 2.

[53]Ibid., p. 1.

[54]Ibid., p. 2.

[55]For an account of the creation of DCS/R&D, see Collins, "Planning for Modern War," pp. 84-95.

[56]Ibid., p. 93.

[57]Ibid., p. 107.

[58]Frank R. Collbohm, "Research and Development Contract: Long Range Air Power," December 1945, Folder WE-RAND October 1945, Box 1, E.L. Bowles Papers, NASM.

[59]Collbohm, "Research and Development Contract," quoted in Collins, "Planning for Modern War," pp. 112-113.

[60]Collbohm, "Research and Development Contract," note 51, quoted in Collins, "Planning for Modern War," p. 114.

[61]Collins, "Planning for Modern War," p. 102.

[62]Ibid., pp. 117-118.

[63]Memorandum, Edward L. Bowles to file, 4 March 1946, Folder WE=RAND October 1945, Box 1, E.L. Bowles Papers, NASM, p. 1, quoted in Collins, "Planning for Modern War," p. 118.

[64]Ibid., quoted in Collins, "Planning for Modern War," p. 119.

[65]For an official description of the satellite vehicle project, see Project RAND First Quarterly Report, Appendix II, "World-Circling Space Ship," RAND Publication RA-15001, June 1946, and Preliminary Design of an Experimental World-Circling Space Ship, Douglas Aircraft Company Report SM-11827, 12 May 1946.

[66]Project RAND Fourth Quarterly Report, RAND Publication RA-15034, 1 March 1947.

[67]Project RAND First Annual Report, RAND Publication RA-15035, 1 March 1947, p. 1.

[68]Warren Weaver, "Comments on a General Theory of Air Warfare," January 1946, Folder "Air Warfare —Warren Weaver," Box U, E.L. Bowles Papers, NASM.

[69]Collins, p. 237.

[70]For Weaver's description of the Tactical-Strategic Computer, see "Comments on a General Theory of Air Warfare," pp. 13-16.

[71]For a detailed description of the Interim Study, see The Interim Study (Reprinted from Project RAND Second Quarterly Report RA-15004), 1 September 1946, RAND Publication RA-15005.

[72]Ibid., p. 27.

[73]Arthur E. Raymond, "Talking Outline—RAND Briefing of 4-21-47," RAND Document D-99-1, 21 April 1947, RAND Classified Library, p. 3.

[74]The ten alternative systems were round trip by piloted airplane and bomb, part-way round-trip piloted airplane and guided missile, one-way piloted airplane and bomb, one-way pilotless airplane and bomb, one-way guided missile, round-trip piloted airplane and bomb using an intermediate land base, round-trip piloted airplane and bomb using an intermediate portable base, part-way round-trip piloted airplane with guided missile and intermediate portable base, round-trip piloted airplane and bomb with part-way round-trip refueling airplane, and one-way pilotless drone airplane and bomb deployed from a round-trip mother airplane. Arthur E. Raymond, "Talk on Project RAND at 1st Advisory Council Meeting, December 12, 1946," RAND Document D-74, RAND Classified Library.

[75]For the emergence of these ideas, see "Aerial Systems Analysis," RAND Document D-84, RAND Classified Library; W. Youden, "Method of Analysis for Appraising Aerial Bombing Systems," RAND Document D-95-1, 21 March 1947, RAND Classified Library; W. Youden, "Method of Analysis for Appraising Aerial Bombing Systems," Appendix I of Project RAND Fourth Quarterly Report, RAND Document D-95-2, 1 March 1947, RAND Classified Library; and L. E. Root, "A Method for Appraising the Capabilities of Aerial Bombing Systems," RAND Document D-141, 21 April 1947, RAND Classified Library.

[76]"Commander Brown's First Report—Origin and Objective of Project RAND, 1st Revision," RAND Document D-138, 18 June 1947, RAND Classified Library.

[77]John von Neumann and Oskar Morgenstern, Theory of Games and Economic Behavior (Princeton: Princeton University Press, 1944). For an intellectual history of von Neumann and Morgenstern's authorship of Theory of Games and Economic Behavior see Robert J. Leonard, "From Parlor Games to Social Science: von Neumann, Morgenstern, and the Creation of Game Theory 1928-1944," Journal of Economic Literature 33 (June 1995): 730-761.

[78]Letter, Edwin W. Paxson to John von Neumann, RAND Document D-63, 6 October 1946, RAND Classified Library.

[79]For a detailed account of Paxson's work on the aerial bombing systems analysis, see Collins, "Planning for Modern War." The revised form of the aerial bombing systems analysis is from R. A. Winnaker, "Project RAND—Its Aims and Activities," RAND Document D-229, 5 February 1948, RAND Classified Library.

[80]Navy Department, Bureau of Aeronautics Liaison Officer, Project RAND, Report No. VI, RAND Document D-201, 13 November 1947, RAND Classified Library, pp. 4-5.

[81]Aerial Combat Research Room layout is described in "Commander Brown's Report No. IV," RAND Document D-186, 10 September 1947, RAND Classified Library. The operation of the room is treated in "Commander Brown's Report VIII," RAND Document D-233,11 February 1948, RAND Classified Library, pp. 5-7. See also, R. A. Winnaker, "Project RAND—Its Aims and Activities," RAND Document D-229, 5 February 1948, RAND Classified Library, pp. 20-22.

[82]Edward S. Quade (d. 1988); RAND staff member, 1948-73, and consultant, 1973-88; assistant professor, University of Florida, 1936-42; training officer, U.S. Navy, 1942-46; professor, University of Florida, 1946-48.

[83]Kaplan, Wizards of Armageddon, 88.

[84]Project RAND Fourth Annual Report, 1 March 1950, p. 7.

[85]Letter, Spaatz to von Karman, 17 December 1946, incorporated into RAND Document D-88, collection of documents relating to origins of air defense systems analysis, RAND Classified Library.

[86]"Preliminary Consideration of AAF Questions on Air Defense," RAND Document D-91, 6 March 1947, RAND Classified Library.

[87]Samuel S. Wilks, "Remarks Concerning Active Air Defense of the United States," RAND Document D-103, RAND Classified Library, p. 2.

[88]Active Defense of the United States Against Air Attack, RAND Report RA-15038, RAND Classified Library.

[89]"Active Defense of the United States Against Air Attack—A Preliminary Study of the Problem," RAND Document D-131, 10 June 1947, RAND Classified Library, pp. 14-16.

[90]For discussions of American leaders' expectations concerning the duration of the U.S. atomic monopoly, see Gregg Herken, The Winning Weapon: The Atomic Bomb in the Cold War, 1945-1950 (New York: Random House, 1981); Melvyn P. Leffler, A Preponderance of Power: National Security, the Truman Administration, and the Cold War (Stanford: Stanford University Press, 1992); and McGeorge Bundy, Danger and Survival: Choices about the Bomb in the First Fifty Years (New York: Random House, 1988).

[91]See memoranda, Henderson to Collbohm, "SAB Policy Committee on Air Defense," 1 December 1949; and, Henderson to Collbohm, "The USAF and Air Defense," 2 December 1949; History, Henderson 1949 Folder, RAND Classified Library. Documents remain secret, notes cleared for publication.

[92]Memoranda to file, L. J. Henderson, "Some Comments Concerning Current Proposals for Air Defense," 11 December 1949, History, Henderson 1949 Folder, RAND Classified Library. Document remains secret, notes cleared for publication.

[93]Memoranda to file, L. J. Henderson, 2 December 1949, History, Henderson 1949 Folder, RAND Classified Library. Document remains secret, notes cleared for publication.

[94]Project RAND, "Defense and Bombing Systems Sub-Projects," RAND Limited Document D(L)-497, May 1949, RAND Classified Library.

[95]Ibid., p. 3.

[96]E. W. Paxson, ed., Strategic Bombing Systems Analysis, RAND Report R-186 (Santa Monica: RAND, 1 March 1950), RAND Classified Library.

[97]Letter, Henderson to Burden, 3 November 1950, History, Henderson 1949 Folder, RAND Classified Library. Document remains confidential, notes cleared for publication.

[98]For discussions of the number of atomic bombs in the U.S. arsenal during this period, see David Rosenberg, "American Atomic Strategy and the Hydrogen Bomb Decision," Journal of American History 66 (May 1979): 68-69, especially note 27; and Gregg Herken, The Winning Weapon: The Atomic Bomb in the Cold War, 1945-1950 (New York: Random House, 1981), pp. 198-202, 241.

[99]Jack Hirshliefer; RAND staff member, 1949-55, and consultant, 1955-84; professor, University of Chicago, 1955-60; professor, University of California at Los Angeles, 1960-; consultant, Hudson Institute, 1962-.

[100]Memorandum, Jack Hirshleifer to Charles J. Hitch, "Remarks on Bombing Systems Analysis," RAND Document D-893-PR, 15 June 1950, RAND Classified Library.

[101]Kaplan, Wizards of Armageddon, 89.

[102]Quoted in Stephen Enke, "Comments on Colonel R. R. Walker's Criticisms of RAND's First Strategic Bombing Systems Analysis," RAND Limited Document D(L)-769, 7 June 1950, RAND Classified Library, p. 1.

[103]Ibid., p. 4.

[104]See, for example, Stephen Enke, "Comments on Colonel R. R. Walker's Criticisms of RAND's First Strategic Bombing Systems Analysis," RAND Limited Document D(L)-769, 7 June 1950, RAND Classified Library.

[105]E. S. Quade, ed., Comparison of Airplane Systems of Strategic Bombing: Multiple-Strike Study, RAND Report R-208 (Santa Monica: RAND, 1950). Secret-restricted data.

[106]Edward J. Barlow (1920-); RAND staff member 1948-60, vice president and general manager, Engineering Division, Aerospace Corporation, 1960-63; member, NASA-DOD Large Launch Vehicle Planning Group, 1961. For biographical information, see Standard & Poor's Register of Corporations, Directors and Executives, 1984, 3 vols. (New York: Standard & Poor's Corp., 1984); and American Men and Women of Science, Physical and Biological Sciences, 15th ed., 7 vols. (New York: R. R. Bowker Co., 1982).

[107]Edward J. Barlow, G. Brown, Charles J. Hitch, R. Krueger, Jean Wylie, "The Air Defense of the United States: Report of the Preliminary Design Group," RAND Document D-746, 18 April 1950, RAND Classified Library.

[108]Ibid., Figure 1.

[109]Ibid., p. 9.

[110]E. J. Barlow, "Preliminary Proposal for Air Defense Study," RAND Limited Document D(L)-816, 2 October 1950, RAND Classified Library.

[111]Ibid., p. 1.

[112]Ibid.

[113]Ibid., p. 2.

[114]Ibid., p. 48.

[115]Collins, p. 367.

[116]Ibid., p. 368.

Chapter 3

[117]Lawrence J. Henderson, Jr.; RAND staff member and vice president, 1946-71, and consultant, 1971; consultant, Board of Economic Warfare, 1942-43; staff member, Radiation Laboratory, M.I.T., 1943-44; expert consultant, Office of the Secretary of War, 1944-46.

[118]L. J. Henderson, "Statement of Purposes, Objectives, and Functions of RAND," RAND Document D-92, 6 March 1947, RAND Classified Library, p. 1.

[119]"Commander Brown's First Report—Origin and Objective of Project RAND, 1st Revision," RAND Document D-138, 18 June 1947, RAND Classified Library, p. 2.

[120]"Commander Brown's First Report—Origin and Objective of Project RAND, 1st Revision," RAND Document D-138, 18 June 1947, RAND Classified Library, p. 3. A formal organization chart with slightly different section names can be found in the Project RAND Second Annual Report, RA-15075, 1 March 1948, p. 6.

[121]R. A. Winnaker, "Project RAND—Its Aims and Activities," RAND Document D-229, 5 February 1948, RAND Classified Library, p. 5.

[122]"Biological Warfare," RAND Document D-410, RAND Archives. This report begins with the statement, "Biological warfare has been used only to a limited extent in the past. The United States Army was apparently prepared, however, to use it in a full-scale attack upon Japan at the end of the last war."

[123]The precise value of Project RAND's subcontract with Battelle Memorial Institute is unreadable from the documentation located to date, but it was in the high six figures.

[124]For a detailed discussion of the factors leading to RAND's incorporation, see Smith, The RAND Corporation, 56-60; and Collins, "Planning for Modern War," 292-301.

[125]Smith, The RAND Corporation, 57.

[126]In the first half of 1949, these departments and the percentages of the research budget they represented were as follows: Missiles (29%); Electronics (20 %): Aircraft (13%); Mathematics (12%); Social Science (11%); Nuclear Physics (9%); and Economics (6%). These departments roughly correspond to those of the earlier period when RAND was an independent division of Douglas Aircraft. Names of the departments and their share of the research budget, of course, changed over the 1950s and early 1960s.

[127]Preliminary Design of an Experimental World-Circling Space Ship, Douglas Aircraft Report SM-11827 (Santa Monica: Douglas Aircraft Company, 2 May 1946).

[128]The final reports of the satellite project are RAND Reports RA-15021 through RA-15032.

[129]For a discussion of RAND's activities in balloon and satellite reconnaissance development, see Merton E. Davies and William R. Harris, RAND's Role in the Evolution of Balloon and Satellite Observation Systems and Related U.S. Space Technology, RAND Report R-3692-RC (Santa Monica: RAND Corporation, 1988).

[130]For a discussion of Project FEED BACK and its significance to later space efforts, see John Logsdon, Exploring the Unknown (Washington, D.C.: NASA History Office, 1995). RAND's work on this project is documented in Project FEED BACK Summary Report, J. E. Lipp andR. M. Salter eds., RAND Report R-262 (Santa Monica: RAND Corporation, 1954).

[131]On RAND's work in communication and reconnaissance satellites, see Merton E. Davies and William R. Harris, RAND's Role in the Evolution of Balloon and Satellite Observation Systems and Related U.S. Space Technology. On Corona, see Albert D. Wheelon, "Corona: The First Reconnaissance Satellites," Physics Today 50: 2 (February 1997), 24-30. Although the Air Force lost out to the CIA in the development of the first generation of reconnaissance satellites, RAND continued to do work on the technology and contributed to subsequent generations of satellites used for military mapping, nuclear arms treaty verification, and early warning systems.

[132]U.S. Congress Select Committee of Astronautics and Space Exploration, Space Handbook: Astronautics and Its Applications (Washington, D.C.: GPO, 1958).

[133]Toward a Rationale for a National Space Program, RAND Report R-349-NASA (Santa Monica: RAND Corporation, 1959).

[134]David T. Griggs (1911-75); RAND staff member, 1946-48, and consultant, 1948-74; research associate, Radiation Laboratory, M.I.T., 1941-42; professor, University of California at Los Angeles, 1948-75; U.S. Air Force chief scientist, 1951-52; U.S.A.F. scientific advisory board member, 1952-75; consultant, Armed Forces Special Weapons Project, 1951-56; chairman, U.S.A.F. ballistic missiles division advisory board, 1963-65; member, Defense Science Board, 1964-75; and consultant, Atomic Energy Commission. For biographical information, see Obituary, New York Times, 4 January 1975, 26; and Who's Who in America, 37th ed., 1972-1973 (Chicago: Marquis Who's Who, 1972).

[135]Memorandum "For Internal Consumption Only," David T. Griggs, "The Capabilities of Atomic Power," RAND Document D-113, 1 April 1947, RAND Classified Library, p. 1.

[136]Project NEPA was established through a prime contract with Fairchild Engine and Airplane Corporation on 23 May 1946 and involved eight other companies. For a discussion of NEPA, see Richard G. Hewlett and Francis Duncan, Atomic Shield, 1947/1952, Volume II of a History of the United States Atomic Energy Commission (University Park, PA: Pennsylvania State University Press, 1969), 71-74.

[137]"Commander Brown's First Report—Origin and Objective of Project RAND, 1st Revision," RAND Document D-138, 18 June 1947, RAND Classified Library, p. 13.

[138]This quote and much of the following on RAND's nuclear propulsion engine are from David T. Griggs's "For Internal Consumption Only" memorandum, "The Capabilities of Atomic Power," p. 1.

[139]Ibid., p. 2.

[140]For an enlightening eyewitness account of the U.S.'s attempts to build a nuclear-powered airplane, see Herbert York, Race to Oblivion (New York, 1970), Chap. 4. See also, Richard G. Hewlett and Francis Duncan, Atomic Shield, 1947-1952 (University Park, PA, 1969), 71-74.

[141]SM-21, February 8, 1954.

[142]The history of the Teapot Committee and the Air Force's ballistic missile program is reviewed in Jacob Neufeld, The Development of the Ballistic Missile in the United States Air Force, 1945-1960 (Washington, D.C., 1990) and Edmund Beard, Developing the ICBM: A Study in Bureaucratic Politics (New York, 1976). See also John Clayton Lonnquest, "The Face of Atlas: General Bernard Schriever and the Development of the Atlas Intercontinental Ballistic Missile, 1953-1960," (Ph.D. diss., Duke University, 1996). York, Race to Oblivion, presents an eyewitness account of the committee's operations.

[143]Herman Kahn, On Thermonuclear War (Princeton, NJ, 1960). Parts of this book were earlier issued as RAND Research Memoranda (RM's) and RAND Papers (P's).

[144]Kahn's advocacy for civil defense initiatives in the United States was supported in part by the research of his RAND colleague Leon Gouré on civil defense in the Soviet Union, part of the Social Science Department's efforts in Soviet studies. Gouré produced several RAND research memoranda and papers, and from them he published Civil Defense in the Soviet Union (Berkeley, CA, 1962). Kahn had begun to work on civil defense-related issues as early as 1957 when RAND initiated, under Kahn's direction, what was termed a "Non-military defense study." Issued April 4, 1958, the report of this study, "Non-military Defense Study—1957," has been declassified and cleared for public release. It contains papers written by numerous RAND researchers, who

explore a wide range of issues related to civil defense, including a study of Soviet civil defense efforts written by R. Moorsteen. D(L)-5085-RC, RAND Corporation, Santa Monica, California. RAND also sponsored in May 1957 a conference on civil defense and military target hardening called the Protective Constructive Conference. The papers at this conference were gathered in a volume, "Proceedings of the Symposium on Protective Construction," S-69, May 27-29, 1957, RAND Corporation. This volume remains classified. Kahn later issued his own paper from that conference as a RAND Document, "Why Shelters?" D-5392, July 24, 1958, RAND Corporation. In the preface to this D, Kahn implies that one of RAND's research managers, Larry Henderson, was not happy with the paper's distribution outside the Air Force and that another RAND researcher, George Clement, thought the paper was, on the whole, "undesirable." The paper strongly advocated hardening of U.S. Air Force assets, such as missile silos and bomber hangers. Over the next few years, Kahn's intense advocacy of civil defense and his insatiable appetite for public notoriety brought Kahn into conflict with RAND's president, Frank Collbohm, and Kahn's employment at RAND terminated in July 1961.

[145]On Kahn and his work on thermonuclear war, see Sharon Helsel, "The Comic Reason of Herman Kahn: Conceiving the Limits to Strategic Uncertainty in 1960," (Ph.D. diss., University of California at Santa Cruz, 1993). On Kahn and early work on Monte Carlo methods and applications, see Peter Galison, "Computer Simulations and the Trading Zone," in Peter Galison and David J. Stump, eds., The Disunity of Science: Boundaries, Contexts, and Power (Stanford, CA, 1996), 142-3. Kahn later wrote an extensive analysis of the Monte Carlo method, "Application of Monte Carlo," RM-1237-AEC, April 19, 1954, revised April 27, 1956, RAND Corporation.

[146]Project RAND Budget for Period January 1-June 30, 1949, RAND Document D-382, RAND Classified Library, p. 3.

[147]Navy Department, Bureau of Aeronautics Liaison Officer, Project RAND, Report No. II, RAND Document D-147, 9 July 1947, RAND Classified Library, p. 8.

[148]Navy Department, Bureau of Aeronautics Liaison Officer, Project RAND, Report No. II, RAND Document D-147, 9 July 1947, RAND Classified Library, pp. 3-4.

[149]On the history of the AMP and Weaver's involvement with it, see Larry Owens, "Mathematicians at War: Warren Weaver and the Applied Mathematics Panel, 1942-1945," in The History of Modern Mathematics, Volume II: Institutions and Applications, ed. David E. Rowe and John McCleary (Boston: Academic Press, 1989), 287-305.

[150]For Williams's account of the Military Worth Section's genesis, see Vaughn D. Bornet, "John Williams: A Personal Reminiscence," RAND Document D-19036, 12 August 1969.

[151]Representing RAND were the project's core staff members: Frank R. Collbohm, J. Richard Goldstein, James E. Lipp, L. E. Root, and John D. Williams. Serving as consultants were Samuel S. Wilks, a mathematical statistician from Princeton, W. A. Wallis, a Stanford economist, Herbert Goldhamer, a sociologist also from Stanford, and Leo C. Rosten, a political scientist.

[152]John D. Williams, "Summary of Conference on Military Worth (July 25, 26, August 2)," RAND Document D-17, August 1946, p. 1.

[153]On Wilks, see his biographical entry in Dictionary of Scientific Biography, s.v., Wilks, Samuel. On Mosteller, see his biographical entry in Contemporary Authors, v. 19-20, s.v. Mosteller, Frederick.

[154]Documentation concerning this meeting can be found in "Prospectus, Conference of Social Scientists, New York City, September 14-19, 1947," RAND Limited Document D(L)-182, September 1947, RAND Classified Library; Navy Department, Bureau of Aeronautics Liaison Officer, Project RAND, Report No. V, RAND Document D-195, 9 October 1947, RAND Classified Library; Navy Department, Bureau of Aeronautics Liaison Officer, Project RAND, Report No. VI, RAND Document D-201, 13 November 1947, RAND Classified Library; Abraham Kaplan, "Proceedings of the New York Conference of Social Scientists," RAND Document D-261, 22 April 1948, RAND Classified Library; and New York Conference of Social Scientists, RAND Report R-106 (Santa Monica: RAND, 9 June 1948).

[155]Abraham Kaplan, "Proceedings of the New York Conference of Social Scientists," RAND Document D-261, 22 April 1948, RAND Classified Library, p. 3.

[156]A verbatim record of the panel discussions and conference proceedings was kept and is available through the publications department of the RAND Corporation. New York Conference of Social Scientists, R-106 (Santa Monica: RAND Corporation, 1948).

[157]Ibid., p. 2.

[158]This summary is from Navy Department, Bureau of Aeronautics Liaison Officer, Project RAND, Report No. VI, RAND Document D-201, 13 November 1947, RAND Classified Library, Appendix B.

[159]Hans Speier (1905-90); RAND staff member, 1948-69, and consultant, 1969-74. For biographical information, see Obituary, New York Times Biographical Service, vol. 21 (February 1990), 186; Obituary, New York Times, 23 February 1990, B-5; and Contemporary Authors, vol. 9, new revision series (Detroit: Gale Research Co., 1983).

[160]For discussions of the early research program of the Evaluation of Military Worth Section, see "Commander Brown's First Report—Origin and Objective of Project RAND, 1st Revision," RAND Document D-138, 18 June 1947, RAND Classified Library; W. C. Ennis, "RAND Activity Summary," RAND Document D-142, 29 May 1947, RAND Classified Library; and, Navy Department, Bureau of Aeronautics Liaison Officer, Project RAND, Report No. II, RAND Document D-147, 9 July 1947, RAND Classified Library.

[161]This machine was designed by RAND staff members with considerable input from mathematician John W. Tukey.

[162]In fact, one of RAND's all-time best-selling books remains A Million Random Digits with 100,000 Normal Deviates (Glencoe, IL: The Free Press, 1955).

[163]"Trip Report of E. W. Paxson, May 3 to 17, 1947," RAND Document D-127, May 1947, RAND Classified Library, p. 5.

[164]Memorandum, J. D. Williams to F. R. Collbohm, "Electronic Digital Computing Machinery," 5 June 1947, D-133. This memorandum is undersigned by David T. Griggs, D. K. Bailey, James E. Lipp, L. E. Root, J. R. Goldstein, Edwin W. Paxson, Cecil Hastings, Jr., W. J. Youden, Olaf Helmer, and John D. Williams.

[165]The dates for the conception and completion of the ENIAC are not agreed upon among historians. For histories of the ENIAC, see John G. Brainerd, "Genesis of the ENIAC," Technology and Culture 17 (1976): 482-488; I. Bernard Cohen, "The Computer: A Case Study of Support by Government, Expecially the Military, of a New Science and Technology," in Everett Mendelsohn, Merritt Roe Smith, and Peter Weingart, eds., Science, Technology, and the Military (Dordrecht: Kluwer, 1988), vol. 1, pp. 119-154; Herman H. Goldstine, The Computer from Pascal to von Neumann (Princeton: Princeton University Press, 1972); Thomas P. Hughes, "ENIAC: The Invention of a Computer," Technikgeschichte 42, no. 2 (1972): 148-165; and Nancy Stern, From ENIAC to UNIVAC: An Appraisal of the Eckert-Mauchly Computers (Bedford, MA: Digital Press, 1981).

[166]On this development, see F. J. Gruenberger, "History of the Johnniac," Annals of the History of Computing 1 (1979), 49-64. RAND also did pioneering work on programming languages and user architecture, including the famous JOSS (Johnniac Open-Shop System). See C. L. Baker, "JOSS Johnniac Open-Shop System," in R. L. Wexelblat, ed., History of Programming Languages (New York, 1981) and Shirley L. Marks, "JOSS: Conversational Computing for the Nonprogrammer," Annals of the History of Computing 4 (1982), 35-42.

[167]Baran initial concept of a distributed communications system is expressed in his "A Distributed Backbone Communications System," RAND Research Memorandum RM-2647, 1 December 1960. A detailed elaboration of Baran's work is documented in a series of eleven Research Memoranda entitled, On Distributed Communications, published by RAND in 1964. See RM-3420-PR, RM-3103-PR, RM-3578-PR, RM-3638-PR, RM-3097-PR, RM-3762-PR, RM-3763-PR, RM-3764-PR, RM3765-PR, RM-3766-PR, AND RM-3767-PR. The final document in this series, "On Distributed Communications: XI. Summary Overview," RM-3767-PR, provides an overview of the report series and its findings.

[168]"Trip Report of E. W. Paxson, May 3 to 17, 1947," RAND Document D-127, May 1947, RAND Classified Library, p. 4.

[169]George B. Dantzig, "Maximization of a Linear Function of Variables Subject to Linear Inequalities," in T. C. Koopmans ed., Activity Analysis of Production and Allocation (New York: John Wiley & Sons, 1951), 339-347. For histories of linear programming and the simplex method, see George B. Dantzig, Origins of the Simplex Method, Technical Report SOL 87-5 (Stanford, CA: Systems Optimization Laboratory, 1987); George B. Dantzig, "Reminiscences about the Origins of Linear Programming," Operations Research Letters 1, 2 (1981), 43-48; and William Orchard-Hays, "Background, Development, and Extensions of the Revised Simplex Method," RAND Research Memorandum RM-1433, 30 April 1954, RAND Archives. For a description of these methods, see Robert Dorfman, Paul A. Samuelson, and Robert M. Solow, Linear Programming and Economic Analysis (New York: McGraw-Hill, 1958).

[170]On Dantzig, see Who's Who in America, 1980-1981, s.v. Dantzig, George B. On the history of the simplex method, see George B. Dantzig, "Reminiscences about the Origins of Linear Programming," Operations Research Letters 1: 2 (1981), 43-48, and idem., Origins of the Simplex Method, Technical Report SOL 87-5 (Systems Optimization Laboratory, 1987).

[171]Richard Bellman, Eye of the Hurricane: An Autobiography (Singapore, 1984), 142.

[172]Bellman's book, Dynamic Programming (Princeton, 1957), brought together much of his early work carried out at RAND. For a complete listing of Bellman's output of unclassified scholarship, see Index of Selected Publications of the RAND Corporation, 1946-1962 (Santa Monica, CA, 1962 and Selected RAND abstracts, 1963-72 (Santa Monica, CA, 1973). On Bellman's reflections on his career at RAND, see Chap. 13, "RAND 1952-65," in his autobiography, Eye of the Hurricane, 173-226.

[173]On the early history of game theory, see Robert J. Leonard, "From Parlor Games to Social Science: von Neumann, Morgenstern, and the Creation of Game Theory 1928-1944," Journal of Economic Literature 32 (1995), 730-61.

[174]Richard Bellman and Abraham Girshick, "An Extension of Results on Duels with Two Opponents, One Bullet Each, Silent Guns, Equal Accuracy," RAND Document D-403, February 1949, RAND Classified Library; Lloyd Shapley, "Duels with Continuous Firing," RAND Document D-424, March 1949, RAND Classified Library; and D. H. Blackwell, "The Noisy Duel, One Bullet Each, Arbitrary, Non-Monotone Accuracy," RAND Document D-442, March 1949, RAND Classified Library.

[175]Lloyd Shapley, "A Hidden-Target Model," RAND Document D-395, February 1949, RAND Classified Library.

[176]Merrill Flood and L. J. Savage," A Game-Theoretic Study of the Tactics of Area Defense," RAND Document D-287, August 1948, RAND Classified Library; and Melvin Dresher and Lloyd Shapley, "Base Line Defense," RAND Document D-399, February 1949, RAND Classified Library.

[177]Melvin Dresher, "The Staggered Attack," RAND Document D-438, March 1949, RAND Classified Library.

[178]Olaf Helmer and D. H. Blackwell, "Continuous Three-Move Games," RAND Document D-435, March 1949, RAND Classified Library.

[179]Kenneth Arrow; RAND consultant, 1948-; research associate, Cowles Commission for Research in Economics, 1947-49; professor, University of Chicago, 1948-49; professor, Stanford University, 1949-68; professor, Harvard University, 1968-. Dr. Arrow was awarded the 1972 Nobel Memorial Prize in Economics for his contributions to general economic equilibrium theory and welfare theory.

[180]A quick idea of RAND's output of game theoretic scholarship can be gained by looking at the publications of the above-mentioned men in Index of Selected Publications of the RAND Corporation, 1946-1962. This volume consists only of non-classified work. Greater output is recorded in the classified Project RAND publications index (Santa Monica, CA, 1963) 2 vols., which indexes classified reports. Moreover, a simple perusal of R. Duncan Luce and Howard Raiffa's bibliography in their Games and Decisions: Introduction and Critical Survey (New York, 1957) reveals the extent of their reliance upon RAND's work in game theory.

[181]John D. Williams, The Compleat Strategyst, Being a Primer on the Theory of Games of Strategy (New York: McGraw-Hill, 1954).

[182]Philip Mirowski's "When Games Grow Deadly Serious: The Military Influence on the Evolution of Game Theory," in Craufurd D. Goodwin, ed., Economics and National Security: A History of their Interaction, Annual Supplement to Volume 23, History of Political Economy (Durham, 1991) is quite helpful in this vein, as is Robert J. Leonard, "Creating a Context for Game Theory," in E. Roy Weintraub, ed., Toward a History of Game Theory, Annual Supplement to Volume 24, History of Political Economy (Durham, 1992).

[183]Quoted in William Poundstone, Prisoners' Dilemma (New York, 1992), 168. Poundstone's book provides a reasonably accurate portrayal of game theory at RAND and RAND's role in game theory.

[184]Richard Bellman (d. 1978); RAND consultant, 1948-52, 1965-73; RAND staff member, 1952-65; professor, Stanford University, 1948-52; professor, University of Southern California, 1965-78. For biographical information, see Richard Bellman, Eye of the Hurricane: An Autobiography.

[185]Richard Bellman, Eye of the Hurricane: An Autobiography, p. 256.

[186]Ibid.

[187]Ibid., 256-263.

[188]Ibid., 263. The book by Kahn to which Bellman referred is On Thermonuclear War (Princeton: Princeton University Press, 1960).

[189]Another instance of security clearance impacting RAND's research occurred during the Korean War. RAND sociologist Herbert Goldhamer's security clearance was suspended in February 1953 while Goldhamer was analyzing Chinese and North Korean prisoner-of-war interviews. The suspension of Goldhamer's clearance temporarily arrested his research on the organization, management, and psychological behavior of communist forces.

[190]On the Cowles Commission, see Carl F. Christ, "The Cowles Commission's Contributions to Econometrics at Chicago, 1939-1955," Journal of Economic Literature 32 (1994), 30-59.

[191]Herbert A. Simon, Models of My Life (New York, 1991), 116.

[192]Economic Theory and Measurement: A Twenty Year Research Report, 1932-1952 (Chicago, 1952), 46-47.

[193]George R. Feiwel, "Oral History I: An Interview [with] Kenneth J. Arrow," in idem., Arrow and the Ascent of Modern Economic Theory (New York, 1987), 193. Helmer, incidentally, was a educated as a philosopher.

[194]Vencill, "Kenneth J. Arrow," p. 12; Kenneth J. Arrow, Social Choice and Individual Values (New York, 1951) [Cowles Commission Monograph No. 12].

[195]Two additional departments emerged from the Economics Department during the early 1950s, both of which served to extend RAND's reputation in economics as applied to defense. David Novick, a major figure in cost analysis, established the Cost Analysis Department in 1950, and Stephen Enke, an economist, founded the Logistics Department in 1953.

[196]Charles J. Hitch and Roland N. McKean, The Economics of Defense in the Nuclear Age (Cambridge, 1960). Hitch became Robert McNamara's Comptroller soon after McNamara took office in 1961. In addition, McNamara hired several other RAND researchers, all of whom were schooled in Hitch and McKean's The Economics of Defense in the Nuclear Age.

[197]Burton Klein, "A Radical Proposal for R. and D.," Fortune 57 (May 1958), 112-13, 218, 222, 224, 228. Quotation appears on 112.

[198]Richard R. Nelson, "The Simple Economics of Basic Scientific Research," Journal of Political Economy 67 (1959), 297-306, and Kenneth J. Arrow, "Economic Welfare and the Allocation of Resources for Invention," in Richard R. Nelson, ed., The Rate and Direction of Inventive Activity: Economic and Social Factors (Princeton, 1962).

[199]David A. Hounshell, "The Medium is the Message, or How Context Matters: The RAND Corporation Builds an Economics of Innovation, 1946-1962," paper delivered at "The Spread of the Systems Approach" Conference, Dibner Institute, Cambridge, Massachusetts, May 3-5, 1996, forthcoming in Thomas P. Hughes and Agatha Hughes, The Spread of the Systems Approach [tentative title] (M.I.T. Press, under review).

[200]For recent views on the place of Nelson's and Arrow's work see Wesley Cohen, "Empirical Studies of Innovative Activity," in Paul Stoneman, ed., Handbook of the Economics of Innovation and Technological Change (Oxford, 1995), 182-264. See also Alfonso Gambardella, Science and Innovation: The U.S. Pharmaceutical Industry During the 1980s (New York, 1995), 1-16; Partha Dasgupta and Paul A. David, "Information Disclosure and the Economics of Science and Technology," in George R. Feiwel, ed. Arrow and the Ascent of Modern Economic Theory (New York, 1987), 519-542; Partha Dasgupta and Paul A. David, "Toward a New Economics of Science," Center for Economic Policy Research, Stanford University, Publication No. 320; David C. Mowery, "Economic Theory and Government Technology Policy," Policy Sciences 16 (1983), 27-43; David C. Mowery and Nathan Rosenberg, Technology and the Pursuit of Economic Growth (New York, 1989), 3-17; Nathan Rosenberg, "Why Do Firms Do Basic Research (With Their Own Money)?" Research Policy 19 (1990), 165-174; and Paula E. Stephan, "The Economics of Science," Journal of Economic Literature 34 (1996), 1199-1235.

[201]The history of Soviet studies in the United States is not developed. But see Charles Thomas O'Connell, "Social Structure and Science: Soviet Studies at Harvard," (Ph.D. diss., UCLA, 1990). O'Connell documents the importance of Air Force and other governmental funding for the nature and direction of Soviet studies at Harvard.

[202]Telephone conversation with Gustave H. Shubert, Senior Fellow and Corporate Advisory, The RAND Corporation, July 2, 1996.

[203]See the following RAND Corporation reports: R-197, RM-804, RM-1042, RM-1055, RM-1282, and P-560.

[204]J. A. Kershaw, one of RAND's principal researchers on the Soviet economy, and J. Hirshleifer were among those producing such studies.

[205]For documentation on the early research agenda of the Social Science Department, see Joseph M. Goldsen and Leo C. Rosten, "Outline of Social Science Research in RAND," RAND Document D-243, 19 March 1948, RAND Classified Library; "Summary of Research Program of the Social Science Division, The RAND Corporation," RAND Document D-574, 22 July 1949, RAND Classified Library; and Hans Speier, "The RAND Social Science Program," RAND Document D-717-PR, 21 February 1950, RAND Classified Library.

[206]Nathan Constantin Leites (1912-87); RAND consultant, 1947-48 and 1963-87, and staff member 1948-62. For biographical information, see Obituary, New York Times, 10 June 1987, B-6.

[207]Paul Kecskemeti, RAND staff member 1948-66, and consultant, 1966-70.

[208]Bernard Brodie (1910-78); RAND staff member, 1951-66, and consultant, 1949-51, 1969-74; professor, Yale University, 1945-51 professor, University of California at Los Angeles, 1966-78. For biographic information, see Contemporary Authors, vols. 17-20, 1st revision (Detroit: Gale Research Co., 1975), 101; Michael Howard, "Brodie, Wohlstetter and American Nuclear Strategy," Survival (Great Britain) 34, no. 2 (1992): 107-116; Barry H. Steiner, Bernard Brodie and the Foundations of American Nuclear Strategy (Lawrence: University Press of Kansas, 1991); Craig D. Wildrick, "Bernard Brodie: Pioneer of the Strategy of Deterrence," Military Review 63, no. 10 (1983): 39-45; and Jeffrey D. Porro, "The Policy War: Brodie vs. Kahn," Bulletin of the Atomic Scientists 38, no. 6 (1982): 16-19.

[209]With Harold D. Lasswell, Leites published a book in 1949 that sought to put a scientific foundation under the study of semantics, The Language of Politics: Studies in Quantitative Semantics (New York, 1949).

[210]Nathan C. Leites, The Operational Code of the Politburo (New York, 1951), xi, xiv.

[211]Ibid., p. 13.

[212]Ibid., p. 66.

[213]Mr. X [George F. Kennan], "The Sources of Soviet Conduct," Foreign Affairs 25 (July 1947), 566-82. Diplomatic historians of the Cold War generally regard the X article as the catalyst for the formulation of the U.S.'s policy of "containment," a word that Kennan's article introduced into the diplomatic lexicon. Kennan's earlier "Long telegram," of course, also played a role. The U.S. policy of containment is embodied in NSC 68, which has now been published in a highly accessible volume edited by Ernest May, American Cold War Strategy: Interpreting NSC 68 (Boston, 1993). On the development of U.S. containment policy, see John Lewis Gaddis, Strategies of Containment: A Critical Appraisal of American National Security Policy (New York, 1982).

[214]L. J. Henderson and Thomas I. Edwards, "Some Principals Concerning Air Defense," 11 December 1949, History-Henderson 1949 Folder, RAND Classified Archives.

[215]In addition to research on the Soviet Union's economy and politics, RAND during the 1950s pursued an extensive research program on machine translation of the Russian language into English. The motives for this research are obvious. RAND already carried out extensive translation work, both on technical subjects and military strategy. Machine translation was but one of the complex applications of computers that RAND pursued during the 1950s and early 1960s and involved many of the same problems that researchers working in artificial intelligence faced.

[216]See Herbert Goldhamer and Andrew W. Marshall, The Frequency of Mental Disease: Long-Term Trends and Present Status, RAND Report R-157 (Santa Monica: RAND, July 1949).

[217]Herbert Goldhamer, "Human Factors in Systems Analysis," RAND Document D-745, 18 April 1950, RAND Classified Library.

[218]Ibid., p. 2.

[219]John L. Kennedy; RAND staff member and head of Systems Research Laboratory, 1951-57, and consultant, 1950, 1957-59; technical aide, Applied Psychology Panel of the Office of Scientific Research and Development, 1942-45; professor and founder, Institute of Applied Experimental Psychology, Tufts University, 1945-51; professor, Princeton University, 1957-66; researcher, Institute for Educational Development, 1966-.

[220]Allen Newell (1927-92); RAND staff member 1950-61, and consultant 1961-81; professor, Carnegie Mellon University, 1961-92. For biographical information, see Obituary, New York Times 20 July 1992, D-8; and Obituary, American Psychologist 48 (November 1993), 1148-1149.

[221]For information on the formation and early research program of the System Research Laboratory, see R. L. Chapman, W. C. Biel, J. L. Kennedy, and A. Newell, "The System Research Laboratory and Its Program," RAND Document D-1166, 7 January 1952, RAND Classified Library; and memorandum, Henderson to U.S.A.F. Major General L. S. Stranathan, "History of the Systems Training Project," 5 October 1955, History, Henderson 1949 Folder, RAND Classified Library (document remains secret, notes cleared for publication).

[222]R. L. Chapman, W. C. Biel, J. L. Kennedy, and A. Newell, "The System Research Laboratory and Its Program," RAND Document D-1166, 7 January 1952, RAND Classified Library, p. 10.

[223]See Claude Baum, The System Builders: The Storyof SDC (Santa Monica: System Development Corporation, 1981).

[224]The history of artificial intelligence is treated in the following works: Allen Newell and Herbert A. Simon, "Historical Addendum" in idem, Human Problem Solving (Englewood Cliffs, N.J., 1972); Pamela McCorduck, Machines Who Think (San Francisco, 1979); James Fleck, "Development and Establishment in Artificial Intelligence," in Norbert Elias et al., Scientific Establishments and Hierarchies, vol. 6 of Sociology of

the Sciences: A Yearbook (Boston, 1982); Simon, Models of My Life; and Daniel Crevier, AI: The Tumultuous History of the Search for Artificial Intelligence (New York, 1991).

[225]"Project proposal to the Rockefeller Foundation," as quoted in McCorduck, Machines Who Think, 93.

[226]John McCarthy (Dartmouth), Marvin Minsky (MIT), Nathaniel Rochester (IBM), and Claude Shannon (Bell Laboratories) organized the project. Those attending also included Trenchard More, Arthur Samuel (IBM), Oliver Selfredge (MIT), Ray Solomonoff (MIT), Herbert Gelernter (IBM), and Allen Newell and Herbert Simon (RAND and Carnegie Tech).

[227]As Newell and Simon point out in Human Problem Solving, Marvin Minsky also did manage to write the first draft of and to solicit feedback on his influential, programmatic article, "Steps Toward Artificial Intelligence," Proceedings of the IRE 49 (1961), 8-29.

[228]James Fleck maintains that because the military (i.e., the Air Force and the Department of Defense's Advanced Research Projects Administration) were the principal funding agents--75% of AI funding derived from these sources between 1954 and 1964—it could skirt typical peer review processes and thereby build this small number of centers of AI excellence. "Development and Establishment in Artificial Intelligence," 181.

[229]On Simon's involvement with the founding of GSIA, see Robert E. Gleeson and Steven Schlossman, "The Many Faces of the New Look: The University of Virginia, Carnegie Tech, and the Reform of American Management Education in the Postwar Era," in Steven Schlossman et al., The Beginnings of Graduate Management Education in the United States (Santa Monica, 1994).

[230]Simon, Models of My Life, p. 200.

[231]Ibid., 198.

[232]Simon's autobiography, Models of My Life, is an excellent source for his view on his own work. Newell, who had dropped out of graduate school in mathematics at Princeton, finished his Ph.D. under Simon at Carnegie Tech. in 1957. Together Simon and Newell wrote several RAND RM's and P's and Human Problem Solving (1972). Simon and Yale-educated James March (Ph.D., 1953) produced their classic work, Organizations (New York, 1958) while March was on the faculty of Carnegie Tech. March was apparently never affiliated with RAND. He collaborated with another of Simon's colleagues and eventual president of Carnegie Mellon University, Richard Cyert, to produce the highly influential book, A Behavioral Theory of the Firm (Englewood Cliffs, N.J., 1963).

[233]Claude Shannon, "Automatic Chess Player," Scientific American 182: 2 (1950), 48-51 and idem., "Programming a Computer for Playing Chess," Philosophical Magazine 41 (1950), 256-75.

[234]A. N. Whitehead and B. Russell, Principia Mathematica, Vol. 1, 2nd ed., reprinted (Cambridge: Cambridge University Press, 1935).

[235]See Newell and Simon, Human Problem Solving for a discussion of Logical Theorist and General Problem Solver. See also Simon's Models of My Life. For critiques of their claims about these programs, see Dreyfus, What Computers Can't Do and Joseph Weizenbaum, Computer Power and Human Reason (San Francisco , 1976).

[236]Vannevar Bush, Science, the Endless Frontier: A Report to the President on a Program for Postwar Scientific Research (Washington, D.C., 1945).

Chapter 4

[237]James R. Killian (1904-1988); president, Massachusetts Institute of Technology, 1948-59; chairman, M.I.T. Corporation, 1959-71; special assistant to the President for science and technology, 1957-59; numerous government advisory positions. For biographical information, see James R. Killian, The Education of a College President: A Memoir (Cambridge: The M.I.T. Press, 1985); Obituary, Current Biography, vol. 49 (March 1988), 60; and Obituary, New York Times, 31 January 1988, 38.

[238]James R. Killian, Jr., Sputnik, Scientists, and Eisenhower: A Memoir of the First Special Assistant to the President for Science and Technology (Cambridge: The M.I.T. Press, 1977), xv. Killian's book provides a useful overview of the impact of Sputnik on American science policy.

[239]See Robert A. Divine, The Sputnik Challenge: Eisenhower's Response to the Soviet Satellite (New York: Oxford University Press, 1993).

[240]Anonymous (probably Philip M. Morse), notes on April 1958 RAND Corporation board of trustees meeting agenda, 10 April 1958, Philip McCord Morse Papers, Collection MC 75, Box 11, "RAND Corporation

Folders," Institute Archives, Massachusetts Institute of Technology, p. 22. For discussions of the budgetary constraints on Air Force research and development prior to Sputnik, see "Air Force Feels R&D Squeeze," American Aviation 20, no. 20 (February 25, 1957), 21; and "Budget Pinch Puts Squeeze on Air Force," American Aviation 20, no. 22 (March 25, 1957), 27. The expansion of Air Force research funding after Sputnik was shaped by the findings of the "Stever Report," an Air Force Scientific Advisory Board study under Dr. H. Guyford Stever, associate dean of engineering at MIT. This study was ordered by Air Force Chief of Staff General Thomas D. White shortly after the first Sputnik launch on 4 October 1957. The Stever Report traced Air Force R&D financing from 1946 through 1957 and found that the only time when R&D spending approached necessary levels was at a time roughly corresponding to the Korean conflict, only about three years. It recommended a dramatic increase in funding for research and development. See "Rundown on the Stever Report," Armed Forces Management 4, no. 11 (August 1958), 19.

[241]Ibid. and History, Deputy Chief of Staff/Development, Directorate of Development Planning, 1 January 1958 to 30 June 1958, DCS/R&D Collection, K140.01, Jan-Jun 1958, vol. 4, Project RAND Office, AFHRC, p. 45.

[242]Robert S. McNamara (1916-); executive, Ford Motor Co., 1946-61; Secretary of Defense, 1961-68; president, World Bank, 1968-81. For biographical information, see William W. Kaufmann, The McNamara Strategy (New York: Harper & Row, 1964); John A. Byrne, The Whiz Kids: Ten Founding Fathers of American Business and the Legacy They Left Us (New York: Doubleday, 1993); Henry Trewhitt, McNamara (New York: Harper and Row, 1971); Deborah Shapley, Promise and Power: The Life and Times of Robert McNamara (Boston: Little, Brown, 1993); Benjamin A. Frankel ed., The Cold War, 1945-1991, vol. 1 (Detroit: Gale Research Co., 1992); and Current Biography, vol. 48 (March 1987), 27-32.

[243]Gregg Herken, Counsels of War, expanded ed. (New York: Oxford University Press, 1987), 90.

[244]Air Force Letter 80-10, 21 July 1948.

[245]Curtis E. LeMay, interview by John T. Bolen, 9 March 1971, March AFB, CA, Air Force Historical Research Center, Maxwell, AL, K239.0512-736, p. 6.

[246]Bruce L. R. Smith, The RAND Corporation: Case Study of a Nonprofit Advisory Corporation (Cambridge: Harvard University Press, 1966) 82-83, note 23.

[247]USAF Special Study Group. Excerpts from "Evaluation of Project RAND" by HQ USAF (AFRDC) Special Study Group. November 1967.

[248]Ibid.

[249]Smith, 105. Smith notes that David Novick, head of RAND's Cost Analysis Department during the 1960s, once estimated the proportion of generalists on RAND's staff to be 25 out of 464 professionals. See Smith, The RAND Corporation, 105, n. 22.

[250]Albert Wohlstetter (1913-); RAND staff member, 1951-65, and consultant, 1965-present; professor, University of Chicago, 1966-present. For biographic information, see Richard Rosecrance, "Albert Wohlstetter," in Makers of Nuclear Strategy, John Baylis and John Garnett, eds. (New York: St. Martin's Press, 1991), 57-69; Benjamin A. Frankel ed., The Cold War, 1945-1991, vol. 1 (Detroit: Gale Research Co., 1992); Michael Howard, "Brodie, Wohlstetter and American Nuclear Strategy," Survival (Great Britain) 34, no. 2 (1992): 107-116; and Andrew W. Marshall, J. J. Martin, and Henry S. Rowen, eds., On Not Confusing Ourselves: Essays on National Security in Honor of Albert and Roberta Wohlstetter (Boulder, CO: Westview Press, 1991).

[251]William W. Kaufmann (1918-); RAND staff member, 1956-61, and consultant, 1950-56, 1961-92; associate professor, Princeton University, 1951-56; professor, Massachusetts Institute of Technology, 1961-84. For biographical information, see Contemporary Authors, vol. 13, 1st revision (Detroit: Gale Research Co., 1975).

[252]Henry S. Rowen (1925-); RAND staff member 1950-61, president, 1967-72; and consultant, 1972-81; Deputy Assistant Secretary of Defense-International Security Affairs, 1961-64; Assistant Director, Bureau of the Budget, 1965-66; professor, Stanford University, 1972-present; senior fellow, Hoover Institution, Stanford University, 1983-present; chairman, National Intelligence Council, Central Intelligence Agency, 1981-83; Assistant Secretary of Defense-International Security Affairs, 1989-91. For biographical information, see Contemporary Authors, vol. 118 (Detroit: Gale Research Co., 1986).

[253]Fred S. Hoffman; RAND staff member, 1951-65, 1973-81, and consultant, 1970-73, 1981-present; Deputy Assistant Secretary of Defense for Systems Analysis, 1965-67; Assistant Director, Bureau of the Budget, 1967-69; vice president, Laird Systems, Inc., 1969-70.

[254]Alain C. Enthoven (1930-); RAND staff member, 1956-60, and consultant, 1969-present; operations researcher, Office of the Director of Defense Research and Engineering, 1960-61; Deputy Assistant Secretary of

Defense-Comptroller, 1961-65; Assistant Secretary of Defense-Systems Analysis, 1965-69; vice president, Litton Industries, 1969-71; president, Litton Medical Products, 1971-73; professor, Stanford University, 1973-present. For biographical information, see Christopher Farrell, "Managed Competition's Dad," Business Week (19 July 1993): 84-85; John Hubner, "The Abandoned Father of Health-Care Reform," New York Times Biographical Service 24 (July 1993): 996-1000; and Who's Who in America, 43rd ed., 1984-1985, 2 vols. (Chicago: Marquis Who's Who, 1984).

[255]The report for this study is Albert J. Wohlstetter, Fred S. Hoffman, R. J. Lutz, and Henry S. Rowen, Selection and Use of Strategic Air Bases, RAND Report R-266 (Santa Monica: RAND Corporation, April 1954).

[256]For a detailed discussion of the Strategic Bases Study, see chapter six of Smith, The RAND Corporation.

[257]Wohlstetter et al., Selection and Use of Strategic Air Bases, x.

[258]For discussions of the doctrine of massive retaliation, see Lawrence Freedman, The Evolution of Nuclear Strategy (New York: St. Martin's Press, 1981), 76-90; Fred Kaplan, The Wizards of Armageddon (New York: Simon and Schuster, 1983); and Gregg Herken, Counsels of War, expanded edition (New York: Oxford University Press, 1987).

[259]For discussions of the evolution of strategic thought, see Gregg Herken, Counsels of War, expanded ed. (New York: Oxford University Press, 1987); Fred Kaplan, The Wizards of Armageddon (New York: Simon and Schuster, 1983); Lawrence Martin, ed. Strategic Thought in the Nuclear Age (London: Heinemann, 1979); Lawrence Freedman, The Evolution of Nuclear Strategy (New York: Macmillan, 1982); Marc Trachtenberg, "Strategic Thought in America, 1952-1966," in idem., Writings on Strategy, 1961-1964, and Retrospective (New York: Garland Press, 1988): 443-484; David Goldfischer, The Best Defense: Policy Alternatives for U.S. Nuclear Security from the 1950s to the 1990s (Ithaca, NY: Cornell University Press, 1993); and Carl H. Builder, The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force (New Brunswick, NJ: Transaction Publishers, 1994).

[260]Alain C. Enthoven, Can U.S. Retaliatory Power Survive in the Early 1960s?, RAND Report R-359 (Santa Monica: RAND Corporation, 1 June 1960), Top Secret-Restricted Data. For a discussion of this report, see Alain C. Enthoven, interview by William W. Moss, 4 June 1971, Washington, D.C., John F. Kennedy Library Oral History Collection, pp. 5-6.

[261]Ibid., 6.

[262]Charles Carey, memorandum, "Impressionistic Consensus of Views," 26 October 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives, pp. 9-10.

[263]The literature on Air Force history is very large. See, for example, Michael S. Sherry, The Rise of American Air Power: The Creation of Armageddon (New Haven: Yale University Press, 1987).

[264]Bruce L. R.. Smith, The RAND Corporation, 49.

[265]For an account of NASA's early years, see Walter A. McDougall, . . . the Heavens and the Earth: A Political History of the Space Age (New York: Basic Books, 1985), 157-209. The historical literature on the U.S. space program is reviewed in Pamela Mack, "Space History," Technology and Culture 30, no. 3 (1989): 657-665.

[266]Neil McElroy (1904-1972); vice president, president, Proctor and Gamble Co., 1943-57; Secretary of Defense, 1957-59. For biographical information, see Current Biography Yearbook, 1973 (New York: H. W. Wilson Co., 1973); Eleanora W. Schoenbaum ed., Political Profiles, The Eisenhower Years (New York: Facts on File, 1977); and George M. Watson, The Office of the Secretary of the Air Force, 1947-1965 (Washington, D.C.: The Center for Air Force History, 1993).

[267]McDougall, . . . the Heavens and the Earth, 167-176.

[268]History, Deputy Chief of Staff/Development, Directorate of Development Planning, 1 January 1959 to 30 June 1959, DCS/R&D Collection, K140.01, Jan-Jun 1959, vol. 3, Project RAND Office, AFHRC, p. 32.

[269]Panel discussion on the RAND Corporation during early 1960s, 27 January 1989, Smithsonian Video History, RAND Archives. Panel included moderator Gustave H. Shubert, Edward J. Barlow, Bruno Augenstein, Hans Speier, Burton Klein, Robert D. Specht, and Albert Wohlstetter.

[270]Alain Enthoven relates the following story concerning the Air Force efforts to suppress the RAND study of Polaris. Enthoven claims that while visiting an Air Force colonel at the Pentagon in 1959, Air Force General Millard Lewis entered the colonel's office and engaged him in a hushed conversation concerning the Polaris report. After the General left, Enthoven asked of the colonel whether General Lewis was trying to obtain a copy of the report and the colonel replied, "No, he's trying to make sure that that report does not get into the hands

of the Weapons Systems Evaluation Group." Alain C. Enthoven, interview by William W. Moss, 4 June 1971, Washington, D.C., John F. Kennedy Library Oral History Collection, p. 15.

[271]Arleigh A. Burke (1901-); Chief of Naval Operations, 1955-61. For biographical information, see E. B. Potter, Admiral Arleigh Burke (New York: Random House, 1990); Who's Who, 1985-1986, An Annual Biographical Dictionary (New York: St. Martin's Press, 1985).

[272]History, Deputy Chief of Staff/Development, Directorate of Development Planning, 1 January 1959 to 30 June 1959, DCS/R&D Collection, K140.01, Jan-Jun 1959, vol. 3, Project RAND Office, AFHRC, p. 32. The preliminary draft report was RAND Research Memorandum RM-2311, "Polaris Weapon System," January 1959.

[273]This discussion of the Air Force objectives of SOFS is taken from "Summary Report on Strategic Offensive Force Study, January 1959 through December 1959," no date, Vivian Arterbery/Gustave Shubert Classified Material Box, SOFS Bibliography Folder, RAND Classified Library, (document remains confidential, notes cleared for publication); History, Deputy Chief of Staff/Development, Directorate of Development Planning, 1 January 1959 to 30 June 1959, DCS/R&D Collection, K140.01, Jan-Jun 1959, vol. 3, Project RAND Office, AFHRC, pp. 28-29; and History, Deputy Chief of Staff/Development, Directorate of Development Planning, 1 July 1959 to 31 December 1959, DCS/R&D Collection, K140.01, Jul-Dec 1959, vol. 3, Project RAND Office, AFHRC, pp. 11-12.

[274]Edward J. Barlow (1920-); RAND staff member 1948-60; vice president and general manager, Engineering Division, Aerospace Corporation, 1960-63; member, NASA-DOD Large Launch Vehicle Planning Group, 1961. For biographical information, see Standard & Poor's Register of Corporations, Directors and Executives, 1984, 3 vols. (New York: Standard & Poor's Corp., 1984); and American Men and Women of Science, Physical and Biological Sciences, 15th ed., 7 vols. (New York: R. R. Bowker Co., 1982).

[275]"Summary Report on Strategic Offensive Force Study, January 1959 through December 1959," no date, Vivian Arterbery/Gustave Shubert Classified Material Box, SOFS Bibliography Folder, RAND Classified Library. Document remains confidential, notes cleared for publication.

[276]The primary projects were Study Design and Synthesis, Strategic Objectives, Simulation Models, U.S. Posture, U.S. Weapon Systems Characteristics and Base Design, Soviet Union Posture, Civil Target Systems, U.S. Vulnerability, Counterforce Analysis, Air Defense, Strategic Penetration, ICBM Defense and Penetration, Water-Based Systems, Overseas Forces and Facilities, Command, Control and Communications Systems, and Strategic Reconnaissance and Surveillance.

[277]Thomas Schelling (1921-); professor, Yale University, 1953-58; RAND consultant, 1956-68, and staff member, 1958-59; professor, Harvard University, 1958-present. For biographical information, see Benjamin A. Frankel ed., The Cold War, 1945-1991, vol. 1 (Detroit: Gale Research Co., 1992), 437-438.

[278]Memorandum, Barlow to List, "Strategic Objectives Committee," 12 February 1959, Vivian Arterbery/ Gustave Shubert Classified Material Box, E. J. Barlow—Chrono File 2/59- Folder, RAND Classified Library.

[279]Smithsonian Video History Panel Discussion moderated by Gustave Shubert (hereafter referred to as Smithsonian Video History). Panel discussion on RAND history during early 1960s. Panelists: B. Augenstein, E. Barlow, H. Speier, B. Klein, R. Specht, A. Wohlstetter, January, 27, 1989.

[280]Smith, The RAND Corporation, 171.

[281]Smithsonian Video History.

[282]"Summary Report on Strategic Offensive Force Study, January 1959 through December 1959," no date, Vivian Arterbery/Gustave Shubert Classified Material Box, SOFS Bibliography Folder, RAND Classified Library. Document remains confidential, notes cleared for publication.

[283]Gustave H. Shubert (1929-); RAND staff member, 1959-91, and consultant, 1991-present; RAND vice president and senior vice president for domestic programs, 1968-78; founding director, Institute for Civil Justice, 1979-87. For biographical information, see Who's Who in America, 43rd ed., 1984-1985, 2 vols. (Chicago: Marquis Who's Who, 1984).

[284]Gustave H. Shubert, unpublished essay, "The Evolution of the RAND Matrix System," 25 January 1995. Essay in author's possession, p. 10.

[285]Curtis E. LeMay, Chairman, Air Force Council, to Thomas D. White, U.S.A.F. Chief of Staff, memorandum, 26 October 1959, Fred Kaplan Papers, Box 9, "SEP 1959" Folder, National Security Archives; and Shubert interview, August 10, 1988, p, 38.

[286]"Summary Report on Strategic Offensive Force Study, January 1959 through December 1959," no date, Vivian Arterbery/Gustave Shubert Classified Material Box, SOFS Bibliography Folder, RAND Classified Library. Document remains confidential, notes cleared for publication.

[287]Smith, The RAND Corporation, 171.

[288]The RAND Military Advisory Group, which consisted of eight general officers from the Air Staff, met with RAND semi-annually and was primarily responsible for advising the Chief of Staff on Air Force policy with respect to Project RAND.

[289]Memo from General Curtis E. LeMay, Chairman of the Air Force Council to General Thomas White, USAF Chief of Staff, "Review of Project RAND," July 17, 1959, Fred Kaplan Papers, Box 9, "JUL 1959" Folder, National Security Archives.

[290]Curtis E. LeMay, Chairman, Air Force Council, to Thomas D. White, U.S.A.F. Chief of Staff, memorandum, "Review of Project RAND," 17 July 1959, Fred Kaplan Papers, Box 9, "JUL 1959" Folder, National Security Archives.

[291]George K. Tanham to J. R. Goldstein, memorandum, "Air Force Council Memorandum to General Wilson," 14 August 1959, J. R. Goldstein Papers, Correspondence (Air Force) AFRDPA (Various Years) Box, RAND Archives.

[292]Ibid.

[293]The actions taken subsequent to the Air Force Council report are identified in History, Deputy Chief of Staff/Development, Directorate of Development Planning, 1 July 1959 to 31 December 1959, DCS/R&D Collection, K140.01, Jul-Dec 1959, vol. 3, Project RAND Office, AFHRC, p. 8; History, Deputy Chief of Staff/ Development, Directorate of Development Planning, 1 January 1960 to 30 June 1960, DCS/R&D Collection, K140.01, Jan-Jun 1960, vol. 3, Project RAND Office, AFHRC; and Curtis E. LeMay, Chairman of the Air Force Council, to General Thomas D. White, USAF Chief of Staff, memorandum, 19 July 1960, Thomas Dresser White Papers, File 5-1, Air Force Council Folder 2, "Jul-Dec 1960 Correspondence" Library of Congress, pp.-2.

[294]For example, the topics chosen for the discussions of the June 1960 RAND/MAG meetings were aerospace defense, strategic concepts and capabilities, the impact of military power on the Cold War, arms control, general space programs, and support management and logistics.

[295]The Project RAND Office reported that by the end of 1960, a total of sixteen evaluations had been conducted by various Air Force agencies of certain aspects of RAND research in order to provide guidance to RAND management in its research programming. History, Deputy Chief of Staff/Development, Directorate of Development Planning, 1 January 1960 to 30 June 1960, DCS/R&D Collection, K140.01, Jan-Jun 1960, vol. 3, Project RAND Office, AFHRC, pp. 8-9; and History, Deputy Chief of Staff/Development, Directorate of Development Planning, 1 July 1960 to 31 December 1960, DCS/R&D Collection, K140.01, Jul-Dec 1960, vol. 2, Project RAND Office, AFHRC, p. 7.

[296] Curtis E. LeMay, Chairman of the Air Force Council, to General Thomas D. White, USAF Chief of Staff, memorandum, 19 July 1960, Thomas Dresser White Papers, File 5-1, Air Force Council Folder 2, "Jul-Dec 1960 Correspondence," Library of Congress, pp.-2.

[297]Smith, The RAND Corporation, p. 134. Smith cites confidential interviews with officials in the Office of the Comptroller (Office of the Secretary of Defense) and the Air Force.

[298]See, for example, George K. Tanham to J. R. Goldstein, memorandum, "Air Force Council Memorandum to General Wilson," 14 August 1959, J. R. Goldstein Papers, Correspondence (Air Force) AFRDPA (Various Years) Box, RAND Archives.

[299]Lindblom's analysis was based, in part, on discussions with approximately sixty people, including RAND staff members, administrators, liaison personnel, and Air Force officers. The papers resultant from the study were all dated December 16, 1959, and were titled Trends in RAND (RAND Memorandum M-7486), Limits on RAND's Effectiveness (RAND Memorandum M-7487), Interactions Among Decision Maker, Problem, and Consultant (RAND Memorandum M-7488), Judgment and Partisanship (RAND Memorandum M-7489), RAND's Missions and Ambitions (RAND Memorandum M-7490), and Suggestions for the Administration of RAND (RAND Memorandum M-7491).

[300]Charles E. Lindblom to Charles J. Hitch, memorandum, "Trends in RAND," 16 December 1959, Richard D. Specht papers, Lindblom binder, RAND Archives, pp. 5-7.

[301]Daniel Ellsberg (1931-); RAND staff member, 1959-64, 1967-70, and consultant, 1970; special assistant to the Assistant Secretary of Defense-International Security Affairs, 1964-65; senior liaison officer, American Embassy, South Vietnam, 1965-66; assistant to the Deputy Ambassador to South Vietnam, 1967; senior research associate, Massachusetts Institute of Technology, 1970-72. For biographical information, see Benjamin A. Frankel ed., The Cold War, 1945-1991, vol. 1 (Detroit: Gale Research Co., 1992), 160-162; Bob Blanchard and Susan Watrous, "Daniel Ellsberg, Interview," The Progressive 53 (September 1989): 17-21; Robert J. McMahon, "Ellsberg," The Encyclopedia of World Biography: 20th Century Supplement (New York: Heraty and Associates, 1987), 438-439; Benjamin A. Frankel ed., The Cold War, 1945-1991, vol. 1 (Detroit:

Gale Research Co., 1992), Who's Who in America, 43rd ed., 1984-1985, 2 vols. (Chicago: Marquis Who's Who, 1984); Contemporary Authors, vol. 69 (Detroit: Gale Research Co., 1978); and Current Biography Yearbook, 1973 (New York: H. W. Wilson Co., 1973).

[302]Charles E. Lindblom to Charles J. Hitch, memorandum, "RAND's Mission and Ambitions," 16 December 1959, Richard D. Specht papers, Lindblom binder, RAND Archives, p. 2.

[303]See Management Committee Meeting Minutes, 7 September 1960, Brownlee Haydon Papers, Box 17, Introspection Folder, RAND Archives; Management Committee Meeting Minutes, 31 August 1960, Brownlee Haydon Papers, Box 17, Introspection Folder, RAND Archives; Joseph M. Goldsen to Frank Collbohm, memorandum, "On the Scope of the RAND Corporation," 13 July 1960, Brownlee Haydon Papers, Box 17, Introspection Folder, RAND Archives; and E. J. Barlow to Management Committee, memorandum, "An Aspect of Research Management at RAND," 18 February 1960, Brownlee Haydon Papers, Box 17, Introspection Folder, RAND Archives.

[304]Albert Wohlstetter to Management Committee, memorandum, "RAND Program of Policy Research," 22 February 1960, Richard D. Specht papers, Lindblom binder, RAND Archives. Wohlstetter notes that his essay was written following consultations with a large group of RAND researchers, including Harry Rowen, Andy Marshall, Gustave Shubert, Robert Specht, William Meckling, Burton Klein, and Armen Alchian. Additionally, Wohlstetter indicates that Edward Barlow, Herman Kahn, William Carey, James Digby, Charles Hitch, John Williams, Charles Lindblom, Herbert Goldhamer, Harvey DeWeerd, Bob Buchheim, and Olaf Helmer were "intellectual contributors to the piece, in one way or another."

[305]Ibid., 5-6.

[306]Franklin R. Collbohm (1907-1990); assistant to the vice president of engineering, Douglas Aircraft Co., 1942-48; member, Office of Scientific Research and Development, 1944-45; director, the RAND Corporation, 1948-56; president, the RAND Corporation, 1956-67. For biographical information, see Obituary, New York Times Biographical Service, vol. 21 (February 1990), 159; and Obituary, New York Times, 14 February 1990, B-5.

[307]Management Committee Meeting Minutes, 7 September 1960, Brownlee Haydon Papers, Box 17, Introspection Folder, RAND Archives, pp. 3-4.

[308]Alain C. Enthoven, interview by William W. Moss, 4 June 1971, Washington, D.C., John F. Kennedy Library Oral History Collection, p. 2.

[309]Management Committee Meeting Minutes, 31 August 1960, Brownlee Haydon Papers, Box 17, Introspection Folder, RAND Archives, p. 4.

[310]Ibid., 5.

[311]For discussions of the involvement of the RAND analysts in the Kennedy campaign, see Gregg Herken, Counsels of War, 140-143; and Fred Kaplan, The Wizards of Armageddon, 248-252.

[312]Memorandum, Henderson to Collbohm, "Principles of Guidance for Distribution of RAND Reports, Memoranda or Recommendations, and Choice of Audience for Briefings," 5 July 1951, History, Henderson 1949 Folder, RAND Classified Library. Document remains confidential, notes cleared for publication.

[313]This committee was formally named the Security Resources Panel of the Science Advisory Committee of the Office of Defense Mobilization.

[314]Gregg Herken, Counsels of War, 114.

[315]Albert Wohlstetter, "The Delicate Balance of Terror," Foreign Affairs 37, no. 2 (January 1959).

[316]Fred Kaplan, The Wizards of Armageddon, 172.

[317]Gregg Herken, Counsels of War, 130.

[318]Fred Kaplan, The Wizards of Armageddon, 140-141 and 169-170.

[319]Ibid., 170.

[320]Gregg Herken, Counsels of War, 131.

[321]Fred Kaplan, The Wizards of Armageddon, 250.

[322]Ibid.

[323]Arnold L. Horelick and Myron Rush, Deception in Soviet Strategic Missile Claims, 1957-1962 (Santa Monica: RAND Corporation, 1963).

[324]Ibid., p. iv.

[325]Robert S. McNamara, Secretary of Defense, ""Year End Statement," December 27, 1961. National Archives, Joint Chiefs of Staff, RG 218 JCS 1961, CCS 5220 "Office of the Secretary of Defense" folder (27 December 1961).

[326]The term "McNamara Revolution" appears to have been coined by Theodore H. White in "Revolution in the Pentagon," Look (April 23, 1963): 31-49.

[327]Charles J. Hitch and Roland N. McKean, The Economics of Defense in the Nuclear Age (Cambridge: Harvard University Press, 1960).

Chapter 5

[328]The foundation for this conviction among RAND analysts was Nathan Leites's widely read and respected The Operational Code of the Politburo (New York: McGraw-Hill, 1951).

[329]Roland N. McKean (1917-); RAND staff member, 1951-65, and consultant, 1965-66; professor, University of California at Los Angeles, 1965-68; professor, University of Virginia, 1968-present. For biographical information, see Contemporary Authors, vols. 33-36, first revision (Detroit: Gale Research Co., 1978); and Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[330]Charles J. Hitch and Roland N. McKean, The Economics of Defense in the Nuclear Age (Cambridge: Harvard University Press, 1960). Background on the preparation of this book is provided by James Digby, James Digby, unpublished essay, "Systems Analysis at RAND 1948-1967," 20 July 1988, "History" Drawer, File Cabinet, RAND Archives, p. 13.

[331]Ibid., v.

[332]The use of the term "rational" in this context is from Gregory Palmer, The McNamara Strategy and the Vietnam War: Program Budgeting in the Pentagon, 1960-1968 (Westport, CT: Greenwood Press, 1978), p. 4. Palmer states, "The rationalist stresses calculated choice between alternatives rather than deference to habit or authority, which, as they might inhibit optimal choice, are always regarded as bad. Favoring calculation, he tends also to favor quantification and thus is often disposed to making his selection from the most easily quantifiable solutions at the neglect of other viable alternatives."

[333]Ibid., 2.

[334]Hitch and McKean, The Economics of Defense, 105.

[335]Charles J. Hitch, Decision-Making for Defense (Berkeley and Los Angeles: University of California Press, 1965), 23-24. A more detailed description of the defense budgeting process, using the development of the fiscal year 1961 budget as an example, can be found in Hitch and McKean, The Economics of Defense, 44-45.

[336]Ibid., 45.

[337]Charles E. Lindblom, Bargaining: The Hidden Hand of Government, RAND Research Memorandum RM-1434-RC, February 22, 1955. Lindblom argued, contrary to the scientific strategists, that bargaining in government is a preferable method of decision-making which achieves considerable attainment of public interest. A relevant example of Air Force resistance to the scientific strategists' ideas can be found in the ideas of program budgeting—the subject of chapter. RAND's program budgeting concepts were first presented to the Air Force Military Advisory Group at a meeting in October, 1956, but this researcher could find no evidence of favorable consideration of the concepts by Air Force leadership. The core of the MAG presentation can be found in David Novick's research memorandum, A New Approach to the Military Budget, RAND Research Memorandum RM-1759, December 6, 1956.

[338]Ralph Sanders, The Politics of Defense Analysis (New York: Dunellen, 1973), p. 41; and Alain C. Enthoven and K. Wayne Smith, How Much is Enough? Shaping the Defense Program, 1961-1969 (New York: Harper & Row, 1971), p. 14.

[339]Alain C. Enthoven and K. Wayne Smith, How Much is Enough? Shaping the Defense Program, 1961-1969 (New York: Harper & Row, 1971), p. 13.

[340]Hitch and McKean, The Economics of Defense, 3.

[341]Charles J. Hitch, Decision-Making for Defense, the H. Rowan Gaither Lectures in Systems Science (Berkeley: University of California Press, 1965), p. 25.

[342]Hitch, Decision-Making for Defense, 44; and Robert J. Leonard, "War as a 'Simple Economic Problem': The Rise of an Economics of Defense," in Economics and National Security: A History of Their Interaction, Annual Supplement to History of Political Economy 23, ed. Craufurd D. Goodwin (Durham and London: Duke University Press, 1991), p. 278.

[343]These core recommendations are enumerated on page 107 of Hitch and McKean, The Economics of Defense.

[344]The ideas expressed in The Economics of Defense reflected the extensive research performed at RAND throughout the 1950s in defense budgeting and cost analysis. For earlier work in this area, see David Novick, Efficiency and Economy in Government Through New Budgeting and Accounting Procedures, RAND Report R-254 (Santa Monica: The RAND Corporation, February 1, 1954); David Novick, Weapon-System Cost Methodology, RAND Report R-287 (Santa Monica: The RAND Corporation, February 1, 1956); David Novick, A New Approach to the Military Budget, RAND Research Memorandum RM-1757 (Santa Monica: The RAND Corporation, June 12, 1956); Kenneth J. Arrow and S. S. Arrow, Methodological Problems in Airframe Cost-Performance Studies, RAND Research Memorandum RM-456 (Santa Monica: The RAND Corporation, September 20, 1950); Malcolm W. Hoag, The Relevance of Costs in Operations Research, RAND Paper P-820 (Santa Monica: The RAND Corporation, April 13, 1956); Gene H. Fisher, Weapon-System Cost Analysis, RAND Paper P-823 (Santa Monica: The RAND Corporation, July 10, 1956); David Novick, Concepts of Cost for Use in Studies of Effectiveness, RAND Paper P-1182 (Santa Monica: The RAND Corporation, October 4, 1957); and Charles J. Hitch, Economics and Operations Research, RAND Paper P-1250 (Santa Monica: The RAND Corporation, January 8, 1958).

[345]Hitch, Decision-Making for Defense, 50.

[346]Charles Hitch, for example, notes that "to push through the development of the programming system in so short a time and make it work required a Secretary as strong and decisive as Robert S. McNamara." (Hitch, Decision-Making for Defense, 71).

[347]John A. Byrne, The Whiz Kids, 36.

[348]Gregory Palmer, The McNamara Strategy and the Vietnam War: Program Budgeting in the Pentagon, 1960-1968 (Westport, CT: Greenwood Press, 1978).

[349]For accounts of the evolution of the Department of Defense from 1947 through 1958, see Alain C. Enthoven and K. Wayne Smith, How Much is Enough? Shaping the Defense Program, 1961-1969 (New York: Harper & Row, 1971); Paul Y. Hammond, The American Military Establishment in the Twentieth Century (Princeton: Princeton University Press, 1961); Morris Janowitz, ed., The New Military: Changing Patterns of Organization (New York: Russell Sage Foundation, 1964); Edward Kolodziej, The Uncommon Defense and Congress, 1945-1963 (Columbus: Ohio State University Press, 1966); John C. Ries, The Management of Defense: Organization and Control of the U.S. Armed Forces (Baltimore: Johns Hopkins University Press, 1964); and James M. Roherty, Decisions of Robert S. McNamara: A Study of the Role of the Secretary of Defense (Coral Gables, FL: University of Miami Press, 1970). Of particular relevance to RAND and the changing Air Force position within the defense establishment, see Arnold Mengel to George Tanham, memorandum, "The Air Force—Its Environment and Organization," 23 June 1972, Donald B. Rice Papers, Air Force 1967-79, Box 1, RAND Archives.

[350]Henry M. Jackson (1912-1983); U.S. Senator from Washington, 1953-83. For biographical information, see Contemporary Authors, vol. 110 (Detroit: Gale Research Co., 1984); Obituary, New York Times Biographical Service, vol. 14 (Sanford, NC: Microfilming Corp. of America, 1983); Elizabeth Devine, ed., The Annual Obituary (New York: St. Martin's Press, 1984); Jonathan Alter, "The Myth of Scoop Jackson," The New Republic 194 (12 May 1986): 15-18; Elliott Abrams, "Unforgettable Scoop Jackson," Reader's Digest 126 (February 1985): 81-85; and Eleanora W. Schoenbaum, ed., Political Profiles, The Eisenhower Years (New York: Facts on File, 1977).

[351]Rockefeller Brothers Fund, International Security: The Military Aspect (Garden City, NY: Doubleday, 1958).

[352]Ibid., 58.

[353]The original National Defense Act of 1947 underwent several revisions prior to 1958, most notably in 1949 and 1953. However, these were not as extensive as the 1958 Act.

[354]A unified command was defined as a military command with a broad continuing mission, under a single commander and composed of significant assigned components of two or more military services. Unified commands were established and so designated by the President, through the Secretary of Defense, with the advice and assistance of the Joint Chiefs of Staff. Specified commands were defined as those with a broad continuing mission, also established and so designated by the President through the Secretary of Defense with the advice and assistance of the JCS, but composed of forces from only one service.

[355]This account is from Ralph Sanders, The Politics of Defense Analysis (New York: Dunellen, 1973), 40.

[356]Ibid.

[357]Thomas S. Gates, Jr. (1906-83); partner, Drexel and Company, 1940-53; Under Secretary of the Navy, 1953-57; Secretary of the Navy, 1957-59; Secretary of Defense, 1960-61; president, director, and chief executive officer, Morgan Guaranty Trust Co., 1961-69. For biographical information, see Eleanora W. Schoenbaum, ed., Political Profiles, The Eisenhower Years (New York: Facts on File, 1977); Who Was Who in America, with World Notables, vol. 8, 1982-1985 (Chicago: Marquis Who's Who, 1985); and Obituary, Current Biography Yearbook, 1983 (New York: H. W. Wilson Co., 1983).

[358]Quoted in James M. Roherty, Decisions of Robert S. McNamara, 44.

[359]Kaufmann, The McNamara Strategy, 38.

[360]Stuart W. Symington (1901-); Assistant Secretary of War for Air, 1946-47; Secretary of the Air Force, 1947-50; chairman, National Security Resources Board, 1950-51; U.S. Senator from Missouri, 1952-77. For biographical information, see Nelson Lichtenstein ed., Political Profiles, The Johnson Years (New York: Facts on File, 1976); Obituary, New York Times Biographical Service, vol. 19 (December 1988), p. 1300; Obituary, Current Biography, vol. 50 (February 1989), p. 63; Obituary, Newsweek 112 (26 December 1988), p. 74; Who's Who in Government, 3rd ed. (Chicago: Marquis Who's Who, 1977); and Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[361]Senator John F. Kennedy, press release, 14 September 1960, Roswell Gilpatric Papers, Box 4, Symington Committee on the Defense Establishment, Correspondence Aug-Oct 1960 Folder, John F. Kennedy Library, p. 3.

[362]Clark M. Clifford (1906-); senior partner, Clifford and Miller, 1950-68; special consultant to the President, 1946-50; Secretary of Defense, 1968-69; senior partner, Clifford and Warnke, 1969-91. For biographical information, see Clark M. Clifford with Richard C. Holbrooke, Counsel to the President: A Memoir (New York: Random House, 1991); Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984); New York Times Biographical Edition, vol. 2 (New York: Arno Press, 1971); and Nelson Lichtenstein ed., Political Profiles, The Johnson Years (New York: Facts on File, 1976).

[363]Thomas K. Finletter (1893-1980); special assistant to the Secretary of State, 1941-44; chairman, President's Air Policy Commission, 1947-48; Secretary of the Air Force, 1950-53; U.S. Ambassador to NATO, 1961-65. For biographical information, see Eleanora W. Schoenbaum, ed., Political Profiles, The Eisenhower Years (New York: Facts on File, 1977); Obituary, Current Biography Yearbook, 1980 (New York: H. W. Wilson Co., 1980); and Obituary, New York Times Biographical Service, vol. 11 (New York: Arno Press, 1980).

[364]Fowler Hamilton (1911-1984); partner, Cleary, Gottlieb, Steen, and Hamilton, 1946-61, 1963-84; administrator, Agency for International Development, 1961-62. For biographical information, see Who Was Who in America, with World Notables, vol. 8, 1982-1985 (Chicago: Marquis Who's Who, 1985); Nelson Lichtenstein ed., Political Profiles, The Kennedy Years (New York: Facts on File, 1976); and Obituary, New York Times Biographical Service, vol. 15 (June 1984), 793.

[365]Marx Leva (1915-); partner, Fowler, Leva, Hawes and Symington, 1951-67. For biographical information, see Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[366]For Gilpatric's contribution to the Rockefeller project, see Roswell Gilpatric, Cravath, Swaine and Moore, "The U.S. Defense Establishment," paper prepared for the Special Studies Project of the Rockefeller Brothers Fund, Inc., October 1956, Roswell Gilpatric Papers, Box 4, Rockefeller Brothers Fund Special Studies Project, The U.S. Defense Establishment, Oct 1956 Folder, John F. Kennedy Library.

[367]The three other national security advisors to Kennedy were Paul M. Nitze (chairman), then the president of the privately supported Foreign Service Educational Foundation, David K. E. Bruce, who served as Ambassador to France and Under Secretary of State in the Truman administration and as Ambassador to Germany from 1957 to 1959, and James A. Perkins, vice president of the Carnegie Corporation and a member of the Gaither Committee that studied national security problems for the Eisenhower Administration. "Kennedy Chooses 4 'Cold War' Aides," New York Times, 31 Aug 1960.

[368]Roswell Gilpatric to Senator Stuart Symington, 21 September 1960, Roswell Gilpatric Papers, Box 4, Symington Committee on the Defense Establishment, Correspondence Aug-Oct 1960 Folder, John F. Kennedy Library, p. 1. These ideas can be found expressed, almost verbatim, in the final report of the Symington committee to President-elect Kennedy. See, Final Draft of Report to Senator Kennedy from the Committee on the Defense Establishment [Symington Committee], November 26, 1960, Roswell Gilpatric Papers, box 4, folder "Symington Committee on the Defense Establishment, Drafts of Report Part II," John F. Kennedy Library, p. 4.

[369]Senator Stuart Symington to members of the Symington Committee on the Defense Establishment, preliminary draft of committee report, "Modernizing the Defense Establishment," 10 October 1960, Roswell Gilpatric Papers, Box 4, Symington Committee on the Defense Establishment, Correspondence Aug-Oct 1960

Folder, John F. Kennedy Library, pp. 5-6.

[370]Symington Committee on the Defense Establishment, final report to President-elect Kennedy, 26 November 1960, Roswell Gilpatric Papers, Box 4, Symington Committee on the Defense Establishment, Drafts of Report Part II Folder, John F. Kennedy Library.

[371]For the summary recommendations of the Symington Committee, see Symington Committee on the Defense Establishment, final report to President-elect Kennedy, 26 November 1960, Roswell Gilpatric Papers, Box 4, Symington Committee on the Defense Establishment, Drafts of Report Part II Folder, John F. Kennedy Library, pp. 15-17.

[372]"Proposed Defense Shake-Up Faces Strong Congressional Objections; Puts President-Elect Kennedy on the Spot," Army Navy Air Force Journal 98, no. 15 (10 December 1960), p. 1.

[373]Roswell Gilpatric, interview by Dennis J. O'Brien, 5 May 1970, John F. Kennedy Library Oral History Collection, p. 104.

[374]David E. Bell, interview by Robert C. Turner, 11 July 1964, John F. Kennedy Library Oral History Collection, pp. 15-16. Here, Nitze relates the following. "I remember when I went to the President's house in Georgetown on the morning of the announcement of my appointment . . . my eye was caught by a letter lying open on top of a pile of magazines on the coffee table. It was a letter from Bob McNamara accepting the President's offer to become Secretary of Defense. . . . It was a short letter . . . [and it recounted] two agreements that he and the President had come to in their discussion earlier in the week. . . ."

[375]Roswell Gilpatric, interview by Dennis J. O'Brien, 5 May 1970, John F. Kennedy Library Oral History Collection, p. 103.

[376]See John Wayne Fuller, "Congress and the Defense Budget: A Study of the McNamara Years," Ph.D. diss., Princeton University, 1972, pp. 76-77.

[377]Roswell Gilpatric, interview by Dennis J. O'Brien, 5 May 1970, John F. Kennedy Library Oral History Collection, 103.

[378]Alain C. Enthoven, interview by William W. Moss, 4 June 1971, Washington, D.C., John F. Kennedy Library Oral History Collection, p. 2.

[379]The first RAND contract with the AOSD (Comptroller) was signed on 15 April 1961, per Anonymous, résumé of thirty-two important research contracts, 3 October 1962, Miscellaneous Files From Washington Office Vault Box, RAND Archives. The tasks defined by this contract were: (1) To define DOD program elements for which resource requests could be estimated in a meaningful manner and to analyze total resource implications of such program elements. (Specific reference to FY 1963 budget, for Air Force and Navy activities.) (2) To analyze existing programming, budget, accounting, and other data systems, primarily in Air Force and Navy, and define areas of critical importance. (3) To study and develop improved data systems and alternative procedures and techniques that would provide up-to-date information (a) to assess costs of alternative programs at various stages of development; (b) to make rational choices among such alternatives; (c) to administer adopted programs against realistic budget criteria; (d) to identify variances from cost standards and (e) to record progress toward approved objectives. (4) To develop concise means of presenting program data specifically by program elements over extended time periods by total program cost as well as by appropriation categories.

[380]Henry S. Rowen, interview by David A. Hounshell and David Jardini, Stanford, CA, 5 December 1994.

[381]Paul H. Nitze (1907-2004); chairman, United States Strategic Bombing Survey, 1944-46; Deputy to Assistant Secretary of State for Economic Affairs, 1948-49; director, Policy Planning Staff, Department of State, 1950-53; Assistant Secretary of Defense-International Security Affairs, 1961-63; Secretary of the Navy, 1963-67; Deputy Secretary of Defense, 1967-69; member, U.S. Delegation, Strategic Arms Limitations Talks, 1969-74; head, U.S. Negotiating Team, Arms Control Talks, 1981-84. For biographical information, see David Callahan, Dangerous Capabilities: Paul Nitze and the Cold War (New York: HarperCollins, 1990); Paul H. Nitze, Steven L. Rearden, and Ann M. Smith, From Hiroshima to Glasnost: A Memoir of Five Perilous Decades (New York: Weidenfeld and Nicolson, 1989); John E. Findling, Dictionary of American Diplomatic History, 2nd ed., revised and expanded (Westport, CT: Greenwood Press, 1989), p. 382; and Zachary Citron, "The Conversion of Paul," The New Republic 200 (30 January 1989): 33.

[382]Joseph A. Kershaw (1913-1989); RAND staff member, 1948-62, and consultant, 1965-68, 1974; professor, Williams College, 1962-89; assistant director, Office of Economic Opportunity, 1965-66; program officer, Ford Foundation, 1968-70; member, board of advisors, Institute for Research on Poverty, University of Wisconsin at Madison, 1966-68. For biographical information, see Obituary, New York Times Biographical Service, vol. 20 (July 1989), 680; Obituary, New York Times, 12 July 1989, B-7; and Who's Who in America, 43rd ed., 1984-1985, 2 vols. (Chicago: Marquis Who's Who, 1984).

[383]Joseph A. Kershaw, sensitive information memorandum, "The Zuckert-LeMay Directives and RAND," 15 November 1961, Mary Anderson/Old Research Council/L. B. Rumph papers, Box 1, Organizational Changes Folder, RAND Archives, p. 10.

[384]Gregg Herken uses the term "Santa Monica priory" as a chapter title and reference to RAND in Counsels of War.

[385]Roswell Gilpatric, interview by Dennis J. O'Brien, 5 May 1970, John F. Kennedy Library Oral History Collection, p. 73.

[386]Alain C. Enthoven and K. Wayne Smith, How Much is Enough? Shaping the Defense Program, 1961-1969 (New York: Harper & Row, 1971), pp. 31-32; Ralph Sanders, The Politics of Defense Analysis (New York: Dunellen, 1973), p. 43-44.

[387]Roswell Gilpatric, interview by Dennis J. O'Brien, 5 May 1970, John F. Kennedy Library Oral History Collection, p. 69.

[388]Alain C. Enthoven, interview by William W. Moss, 4 June 1971, Washington, D.C., John F. Kennedy Library Oral History Collection, 5.

[389]Herbert F. York (1921-); physicist and associate director, Lawrence Radiation Laboratory, University of California at Berkeley, 1943-58; director, Lawrence Livermore Laboratory, 1952-58; chief scientist, Advanced Research Projects Agency, 1958; Director of Defense Research and Engineering, 1958-61; chancellor, University of California at San Diego, 1961-64; 1970-72; professor, University of California at San Diego, 1964-present; numerous government advisory positions. For biographical information, see Herbert F. York, Making Weapons, Talking Peace: A Physicist's Odyssey from Hiroshima to Geneva (New York: Basic Books, 1987); Contemporary Authors, vols. 29-32, first revision (Detroit: Gale Research Co., 1978); Eleanora W. Schoenbaum, ed., Political Profiles, The Eisenhower Years (New York: Facts on File, 1977); American Men and Women of Science, Physical and Biological Sciences, 15th ed., 7 vols. (New York: R. R. Bowker Co., 1982); and Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[390]The Planning-Programming-Budgeting system is referred to in the literature as both PPBS and PPB. The more flexible PPB will be used in the present dissertation.

[391]Alain C. Enthoven, interview by William W. Moss, 4 June 1971, Washington, D.C., John F. Kennedy Library Oral History Collection, 5.

[392]The following discussion of the conceptual components of the PPB system is from Alain C. Enthoven and K. Wayne Smith, How Much is Enough? Shaping the Defense Program, 1961-1969 (New York: Harper & Row, 1971), 33-47; Hitch, Decision-Making for Defense; David Novick, "The Department of Defense," in idem. Program Budgeting: Program Analysis and the Federal Budget (Cambridge, MA: Harvard University Press, 1965), 81-117; and Harold A. Hovey, The Planning-Programming-Budgeting Approach to Government Decision-Making (New York and Washington: Frederick A. Praeger, 1968.

[393]The following description of the defense PPB system is from Charles J. Hitch, remarks before the War College, Air University, Maxwell AFB, AL, 14 December 1961, AFHRC; and Hitch, Decision-Making for Defense, 31-39. Descriptions of the PPB systems can also be found in Alain C. Enthoven and K. Wayne Smith, How Much is Enough? Shaping the Defense Program, 1961-1969 (New York: Harper & Row, 1971); William Kaufmann, The McNamara Strategy, 172-181; and John Wayne Fuller, "Congress and the Defense Budget: A Study of the McNamara Years," Ph.D. diss., Princeton University, 1972.

[394]Charles J. Hitch, "Analysis for Air Force Decisions," in Analysis for Military Decisions, ed. E. S. Quade (Santa Monica: RAND Corporation, 1964), 13-14.

[395]The following discussion of Draft Presidential Memorandums is from Enthoven and Smith, How Much is Enough?, 53-56.

[396]Quoted in Enthoven and Smith, How Much is Enough?, 53.

[397]The subjects included logistic guidance for general purpose forces, Asia strategy and force structure, NATO strategy and force structure, general purpose forces, land forces, tactical air forces, escort ship forces, antisubmarine warfare forces, amphibious forces, naval replenishment and support forces. mobility forces, strategic offensive and defensive forces, theater nuclear forces, nuclear weapons and materials requirements, research and development, and military assistance programs.

[398]Ralph Sanders, The Politics of Defense Analysis (New York: Dunellen, 1973), 70.

[399]The reader may be struck by conceptual congruence between the management system implemented by McNamara and his colleagues and some of the earliest ideas on "scientific management." In 1903, Frederick Winslow Taylor published Shop Management, which laid out the basic principles of his management philosophy [Frederick Winslow Taylor, "Shop Management," American Society of Mechanical Engineers Transactions 24

(1903)]. In terms of task management, Taylor advocated "scientific" management techniques that utilized rational job and tool designs and quantitative analytical methods in pursuit of optimal management decision-making (e.g., the "Schmidt" pig iron carrying experiments and time-motion studies). While the PPB system that was constructed in the Department of Defense did not explicitly concern itself with the micro-management of military tasks, the centralization of control it permitted facilitated incursions by central managers in operational matters. Air Force vice chief of staff David Holloway, for example, recalls with dismay the intrusion of McNamara's office in tactical planning during the Vietnam War: "[T]argeting itself and the timing on the targeting . . . was not only not done out there [in Vietnam] by those guys, it wasn't done by the staff at SAC either or the staff anywhere else." (U.S.A.F. Special Study Group, "Evaluation of RAND," Brownlee Haydon Papers, Box 17, RAND Archives, pp. 23-24) Instead, Holloway argues, target planning was performed largely in the Pentagon by OSD staff members.

The congruence between Taylor's ideas and the management system implemented by Robert McNamara is even closer in more broad organizational matters. Here, Taylor's ideas incorporated the separation of planning from production, the creation of central planning offices staffed by statistically oriented experts, and a functional management structure.. In the first case, the PPB structure and its integral employment of systems analysis as a decision-making tool was designed to segregate analysis and planning sharply from execution and day-to-day military operations. As Alain Enthoven comments, "defense is too important to be left to the vested interests of the services." (Alain C. Enthoven, interview by William W. Moss, 4 June 1971, Washington, D.C., John F. Kennedy Library Oral History Collection, 12.) As such, the OSD systems analysts acted much as a central planning office staffed by individuals who were more analytically than operationally astute. Finally, the "program" basis of PPB was intended to reorient the defense management system around functional "outputs" or missions rather than operational units. Ironically, when Taylor wrote "Shop Management," he argued that his system of industrial management represented an abandonment of the "military style" of management. [Frederick Winslow Taylor, Shop Management, (New York: Harper and Brothers, 1911), p. 98]. In these ways, then, the implementation of PPB by McNamara and the Whiz Kids represented the "Taylorization" of military management.

[400]Gregg Herken, Counsels of War, expanded ed. (New York: Oxford University Press, 1987), 137.

[401]Roswell Gilpatric, interview by Dennis J. O'Brien, 5 May 1970, John F. Kennedy Library Oral History Collection, p. 72.

[402]Ralph Sanders finds four sources of antagonism in Ralph Sanders, The Politics of Defense Analysis (New York: Dunellen, 1973), pp. 147-150. He adds differing attitudes toward risk-taking and disagreement over the relative merits of experience and rationality. I argue that these are best understood as subsets of the shift in power from the military to the OSD and the clash of personalities involved.

[403]For example, a 1961 Air Force Scientific Advisory Board report on civilian-military relations, the Stever Report [U.S.A.F Scientific Advisory Board, "Report of the Scientific Advisory Board Committee on Air Force Utilization of Scientific Resources," 26 May 1961, James F. Whisenand Collection, 168.7017-54, Miscellaneous Papers, Outlines, and Talking Papers, 1957-62 Folder, AFHRC, p.2], noted, "[T]he new generation of technically trained and experienced administrators [in the Office of the Secretary of Defense] believe in going directly to individuals and groups who can speak with authority on a subject; they go directly to the working laboratory or industry that originated a technical idea for information and advice on the technical programs. This often short circuits the sometimes unwieldy information channels which they find within the Air Force."

[404]Ralph Sanders, The Politics of Defense Analysis (New York: Dunellen, 1973), p. 148. In 1961, Alain Enthoven was 31 years old, Henry Rowen was 36, Adam Yarmolinsky 39, Harold Brown 34, and Charles Hitch, the old man of the group, was 51.

[405]W. Barton Leach (1900-71); professor, Harvard University School of Law, 1931-71; professor, Harvard Graduate School of Public Administration (now John F. Kennedy School of Government), 1954-71; consultant to the U.S. Air Force, 1947-71. For biographical information, see Who Was Who in America, with World Notables, vol. 5, 1969-1973 (Chicago: Marquis Who's Who, 1973); and Obituary, New York Times Biographical Edition, vol. 2 (New York: Arno Press, 1971).

[406]W. Barton Leach, Law School of Harvard University and Consultant to the Secretary of the Air Force, to Eugene M. Zuckert, memorandum, "Civilian/Military Determination of Defense Policy," 22 January 1962, Glen W. Martin Collection, 168.7048-5, 1962-1965, Zuckert-LeMay Conference (1962) Folder, AFHRC, p. 5.

[407]Register and Defense Times, 8 April 1961.

[408]General Thomas D. White (1901-65); U.S. Air Force vice chief of staff, 1953-57; chief of staff, 1957-61. For biographical information, see Obituaries on File (New York: Facts on File, 1979); and Webster's American Military Biographies (Springfield, MA: G. and C. Merriam Co., 1978).

[409]General Thomas D. White, "Strategy and the Defense Intellectuals," Saturday Evening Post 236 (4 May 1963), 10. For similar criticisms, see General Nathan F. Twining, Neither Liberty nor Safety (New York: Holt Reinhart and Winston, 1966); George W. Anderson, "Pentagon Imbalance," Vital Speeches 29 (October 1, 1963); U.S. Congress, House, Subcommittee of the Committee on Appropriations, Testimony of Vice Admiral Hyman G. Rickover, USN, 89th Cong, 1st sess., 1967; General Curtis E. LeMay, America is in Danger (New York: Funk and Wagnalls, 1968); and Ralph M. Tucker, "Cost-Effectiveness—Fact or Fancy," U.S. Naval Institute Proceedings 90 (September 1964).

[410]David E. Lilienthal (1899-1981); director, Tennessee Valley Authority, 1933-41; chairman, Tennessee Valley Authority, 1941-46; chairman, Atomic Energy Commission, 1946-50; chief executive officer, Development and Resources Corporation, 1955-; numerous government advisory positions. For biographical information, see Contemporary Authors, vol. 3, new revision series (Detroit: Gale Research Co., 1981); Who Was Who in America, with World Notables, vol. 7, 1977-1981 (Chicago: Marquis Who's Who, 1981); Obituary, Current Biography Yearbook, 1981 (New York: H. W. Wilson Co., 1981); McGraw-Hill Encyclopedia of World Biography (New York: McGraw-Hill, 1973); and Janet Podell, ed., Annual Obituary (New York: St. Martin's Press, 1982).

[411]See David E. Lilienthal, "Skeptical Look at Scientific Experts," The New York Times Magazine (20 September 1963): 23, 79-84.

[412]Alexander H. Flax (1921-); chief scientist, U.S. Air Force, 1959-61; Assistant Secretary of the Air Force for Research and Development, 1961-69; vice president for research, Institute for Defense Analyses, 1969-. For biographical information, see American Men and Women of Science, Physical and Biological Sciences, 15th ed., 7 vols. (New York: R. R. Bowker Co., 1982); and Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[413]Alexander H. Flax, interview by Dr. J. C. Hasdorff and Jacob Neufeld, 27-29 November 1973, Washington, D.C., K239.0512-691, Air Force Historical Research Center, pp. 216-217.

[414]Bruno W. Augenstein (1923-); RAND staff member, 1949-58; director of planning, Lockheed Missiles and Space Co., 1958-61; special assistant for reconnaissance and intelligence to the Secretary of Defense, 1961-65; research advisor, Institute for Defense Analyses, 1965-67; RAND vice president for research, 1967-72; RAND consultant, 1972-76; RAND senior scientist, 1976-present; numerous government advisory positions. For biographical information, see American Men and Women of Science, Physical and Biological Sciences, 15th ed., 7 vols. (New York: R. R. Bowker Co., 1982); and Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[415]Bruno Augenstein, interview by David A. Hounshell and David Jardini, Santa Monica, CA, December 7, 1994.

[416]"Whose Imprint on Reorganization Changes—Symington or McNamara?" Army Navy Air Force Journal 99, no. 9 (October 28, 1961): 1, 6.

[417]Lt. General A. T. McNamara, U.S. Army, Director, to the Chairman of the Joint Chiefs of Staff, memorandum, 26 December 1961, NARA, Records of the Joint Chiefs of Staff, JCS 1961, CCS 5220.1 "Office of Secretary of Defense (DSA)" Folder, RG 218, p. 1. For discussion of the creation and responsibilities of DIA and DSA, see William Kaufmann, The McNamara Strategy, 190-195.

[418]Colonel Thomas M. Love, USAF, to Generals James Ferguson and James Whisenand, memorandum, "Some Fundamental Thoughts on Development Planning," 7 September 1962, , James Whisenand Collection, 168.7017-26, "R&D Functions Study Folder for General Ferguson and General Whisenand, 1949-1962," AFHRC, p. 2.

[419]Memo from Secretary of the Air Force Eugene Zuckert to USAF Chief of Staff Curtis E. LeMay, 4 February 1963, pp. 1-2. Library of Congress Manuscripts Division, Papers of Curtis Emerson LeMay, Box B-129, "Air Force, Office of the Secretary of, 1963" Folder.

[420]George M. Watson, The Office of the Secretary of the Air Force, 1947-1965 (Washington, D.C.: The Center for Air Force History, 1993), 205.

[421]Accounts of the long relationship between McNamara and Zuckert can be found in interviews at the John F. Kennedy Library. See, Robert S. McNamara, interviewed by Arthur M. Schlesinger, Jr., Washington, D.C., April 4, 1964, 11-12; and Eugene M. Zuckert, interviewed by Lawrence E. McQuade, Washington, D.C., April 18, 1964, 28.

[422]Alexander H. Flax, interview by Dr. J. C. Hasdorff and Jacob Neufeld, 27-29 November 1973, Washington, D.C., K239.0512-691, Air Force Historical Research Center, pp. 48-49.

[423]Zuckert comments, for example, "I tended to share the Air Force suspicion of the academic types who began to appear on the scene." Eugene M. Zuckert, interview by Lawrence E. McQuade, 18 April 1964, Washington, D.C., John F. Kennedy Library Oral History Collection, p. 26.

[424]Eugene M. Zuckert, interview by Dr. George M. Watson, Jr., 3-5 and 9 December 1986, Washington, D.C., Air Force Historical Research Center, Maxwell, AL; K239.0512-1763, p. 11.

[425]See, for example, Richard Rhodes, "The General and World War III," The New Yorker 71 (19 June 1995): 47-48.

[426]Ibid., 82.

[427]Ibid., 81.

[428]Lawrence J. Henderson, essay, "Recent Inquiries into and Studies of Non-Profit Corporations," 27 November 1961, Miscellaneous Files From Washington Office Vault Box, RAND Archives, p. 5.

[429]Eugene M. Zuckert, Secretary of the Air Force, memorandum, "Policies on Relations with Air Force Sponsored Nonprofit Corporations (Aerospace, Analytic Services, Mitre, RAND, System Development Corporation)," 22 September 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Box 1, Organizational Changes Folder, RAND Archives, p.1.

[430]Project Alamein Overview, Glen W. Martin Collection, 168.7048-5, 1962-1965, Zuckert-LeMay Conference (1962) Folder, AFHRC, p. 1.

[431]Eugene M. Zuckert, interview by Dr. George M. Watson, Jr., 3-5 and 9 December 1986, Washington, D.C., Air Force Historical Research Center, Maxwell, AL; K239.0512-1763, p. 11.

[432]Eugene M. Zuckert, Secretary of the Air Force, to the participants of Project Alamein, memorandum, 15 January 1962, Glen W. Martin Collection, 168.7048-5, 1962-1965, Zuckert-LeMay Conference (1962) Folder, AFHRC, pp. 1-2.

[433]Ibid., 2.

[434]Project Alamein Overview, Glen W. Martin Collection, 168.7048-5, 1962-1965, Zuckert-LeMay Conference (1962) Folder, AFHRC, pp. 6-7.

[435]Eugene M. Zuckert, "The Service Secretary: Has He a Useful Role?" Foreign Affairs 40 (April 1966): 458-479.

[436]Robert S. McNamara, interviewed by Arthur M. Schlesinger, Jr., Washington, D.C., April 4, 1964, 16. John F. Kennedy Library Oral History Collection.

[437]Ida R. Hoos, Systems Analysis in Public Policy: A Critique, revised ed. (Berkeley and Los Angeles: University of California Press, 1983), 48. See also, James R. Schlesinger, Systems Analysis and the Political Process, RAND Paper P-3464 (Santa Monica: The RAND Corporation, June 1967), 14-17.

Chapter 6

[438]C. Wright Mills (1916-1962); professor, Columbia University, 1946-62. For biographical information, see Rick Tilman, C. Wright Mills: A Native Radical and His American Intellectual Roots (University Park: Pennsylvania State University Press, 1984); Irving Louis Horowitz, C. Wright Mills: An American Utopian (New York: Free Press, 1983); Barbara H. Chasin, "C. Wright Mills, Pessimistic Radical," Sociological Inquiry 60 (Fall 1990): 337-351; Frederick R. Swan, "Toward a New Democratic Political Theory: Contributions by C. Wright Mills," Midwestern Quarterly 25 (Spring 1984): 298-309; Elizabeth Devine et al., eds., Thinkers of the Twentieth Century: A Biographical, Bibliographical, and Critical Dictionary (Detroit: Gale Research Co., 1983), pp. 390-392; Dan Wakefield, "Before His Time," The Nation 239 (15 September 1984): 212-213; (Contemporary Authors, vol. 107 (Detroit: Gale Research Co., 1983); McGraw-Hill Encyclopedia of World Biography (New York: McGraw-Hill, 1973); Eleanora W. Schoenbaum, ed., Political Profiles, The Eisenhower Years (New York: Facts on File, 1977); Howard R. Lamar, ed., The Reader's Encyclopedia of American Literature (New York: Thomas Y. Crowell Co., 1977); and Who Was Who in America, with World Notables, vol. 4, 1961-1968 (Chicago: Marquis Who's Who, 1968).

[439]C. Wright Mills, The Power Elite (New York: Oxford University Press, 1956).

[440]Dwight D. Eisenhower, "Farewell Radio and Television Address to the American People," January 17, 1961.

[441]Henry J. Aaron, Politics and the Professors: The Great Society in Perspective (Washington, D.C.: The Brookings Institution, 1978), 2-7.

[442]Stanley Karnow, Vietnam: A History (New York: Penguin, 1983), 320.

[443]Robert H. Haveman, Poverty Policy and Poverty Research: The Great Society and the Social Sciences (Madison: University of Wisconsin Press, 1987), 14.

[444]Robert J. Lampman (1920-); professor, University of Wisconsin at Madison, 1955-present; research associate, National Bureau of Economic Research, 1957-58; member, President's Council of Economic Advisors, 1962-63. For biographical information, see Who's Who in Economics: A Biographical Dictionary of Major Economists, 1700-1981 (Cambridge: The M.I.T. Press, 1983); and Contemporary Authors, vol. 103 (Detroit: Gale Research Co., 1982).

[445]Adam Yarmolinsky, "The Beginnings of the OEO," in On Fighting Poverty: Perspectives from Experience, ed. James L. Sundquist (New York: Basic Books, 1969), 37.

[446]Daniel Patrick Moynihan (1927-2003); special assistant to the Secretary of Labor, 1961-62; executive assistant to the Secretary of Labor, 1962-63; Assistant Secretary of Labor, 1963-65; director, Joint Center for Urban Studies, Massachusetts Institute of Technology and Harvard University, 1966-69; professor, Kennedy School of Government, Harvard University, 1966-77; U.S. Senator from New York, 1977-2003. For biographical information, see John E. Findling, Dictionary of American Diplomatic History, 2nd ed., revised and expanded (Westport, CT: Greenwood Press, 1989), 367-368.

[447]Daniel P. Moynihan, Maximum Feasible Misunderstanding: Community Action in the War on Poverty (New York: The Free Press, 1969), 63.

[448]This report is cited in Adam Yarmolinsky, Special Assistant to the Secretary of Defense, to Senator Walter W. Stiern (Calif), 11 June 1962, Adam Yarmolinsky Papers, Box 11, Chron File Apr-June 1962 Folder, John F. Kennedy Library, pp. 2-3.

[449]Harvey A. Averch and John E. Koehler, "A Note on Black and White Attitudes in 1960," RAND Document D-20055-ARPA/AGILE (Santa Monica: RAND, 1960).

[450]Paul Armer to Frank Collbohm, memorandum, "Preliminary Report of the Future Work Team," 11 April 1966, Miscellaneous Files From Washington Office Vault Box, RAND Archives, p. 4.

[451]Adam Yarmolinsky to Hays Redmon, memorandum, "Why Should Conservatives Support the War on Poverty?" 25 May 1964, Adam Yarmolinsky Papers, Box 87, OEO Poverty Task Force Folder, John F. Kennedy Library, pp. 1-2.

[452]Daniel P. Moynihan, Maximum Feasible Misunderstanding, 79.

[453]Walter W. Heller (1915-1991); professor, University of Minnesota, 1946-present; chairman, President's Council of Economic Advisors, 1961-64; consultant to the Office of the President, 1965-69, 1974-77. For biographical information, see Obituary, American Philosophical Society Proceedings 135 (March 1991): 99-107; Obituary, Brookings Papers on Economic Activity (1987): viii-xi; James Tobin, "Remembering Walter Heller," Challenge 30 (November-December 1987): 59-63; Obituary, New York Times Biographical Service, vol. 18 (June 1987); Contemporary Authors, vols. 21-24, first revision (Detroit: Gale Research Co., 1977); Nelson Lichtenstein ed., Political Profiles, The Kennedy Years (New York: Facts on File, 1976); Who's Who in Economics: A Biographical Dictionary of Major Economists, 1700-1981 (Cambridge: The M.I.T. Press, 1983); and Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[454]Ibid., 80.

[455]This typology of theories on poverty is from Stephen M. Rose, The Betrayal of the Poor: The Transformation of Community Action (Cambridge, MA: Schenkman Publishing, 1972), 22-29.

[456]For work in this vein, see Allison Davis, "The Motivation of the Underprivileged Worker," in Industry and Society, ed. William Foote Whyte (New York: McGraw-Hill, 1946); Oscar Lewis, La Vida (New York: Random House, 1966) and Children of Sanchez (New York: Random House, 1961); Alexander H. Leighton, "Poverty and Social Change," The Scientific American 212, no. 5 (May 1965); David Matza, "The Disreputable Poor," in Class, Status and Power: Social Stratification in Comparative Perspective, 2nd ed., ed. Rienhard Bendix and Seymour Martin Lipset (New York: The Free Press, 1966); Gordon E. Brown, ed., The Multi-Problem Dilemma (Matuchen, N.J.: Scarecrow Press, 1968); Walter B. Miller, "Lower Class Culture as a Generating Milieu of Gang Delinquency," Journal of Social Issues 14, no. 3 (1958) and "Implications of Urban Lower-Class Culture for Social Work," Social Service Review 33, no. 3 (September 1959); Charles A. Valentine, Culture and Poverty (Chicago: University of Chicago Press, 1968); and Herbert H. Hyman, "The Value Systems of Different Classes," in Class, Status and Power: Social Stratification in Comparative Perspective, 2nd ed., ed. Rienhard Bendix and Seymour Martin Lipset (New York: The Free Press, 1966).

[457]For scholarship that supports this perspective, see Robert K. Merton, Social Theory and Social Structure, revised and enlarged ed. (Glencoe, IL: The Free Press, 1957); Richard A. Cloward and Lloyd E. Ohlin, Delinquency and Opportunity (Glencoe, IL: The Free Press, 1960); Elinor Graham, "The Politics of Poverty," in Poverty as a Public Issue, ed. Ben B. Seligman (New York: The Free Press, 1965); George Simmel, "The Poor," Social Problems 13, no. 2 (Fall 1965); Lewis A. Coser, "The Sociology of Poverty," Social Problems 13, no. 2 (Fall 1965); S. M. Miller and Martin Rein, "The War on Poverty: Perspectives and Prospects," in Poverty as a Public Issue, ed. Ben B. Seligman (New York: The Free Press, 1965); Hyman Lumer, Poverty: Its Roots and Its Future (New York: International Publishers, 1965); Charles E. Silberman, Crisis in Black and White (New York: Random House, 1964); Elliot Liebow, Tally's Corner: A Study of Negro Streetcorner Men (Boston: Little, Brown and Company, 1967).

[458]For work that supports this perspective, see Mollie Orshansky, "Counting the Poor: Another Look at the Poverty Profile," Social Security Bulletin 28, no. 1 (January 1965); Ewan Clague, "The Economic Context of Social Welfare in the United States," Social Work Year Book—1957 (New York: National Association of Social Workers, 1957); Robert Lekachman, "Can 'More Money' End Poverty," in Poverty: Views from the Left, ed. Jeremy Larner and Irving Howe (New York: William Morrow, 1968); President's Commission on Income Maintenance Programs, Poverty Amid Plenty: The American Paradox (Washington: G.P.O., 1969); Gunnar Myrdal, "The War on Poverty," in New Perspectives on Poverty, ed. Arthur B. Shostak and William Gomberg (Englewood Cliff: Prentice-Hall, 1965); Burton A. Weisbrod, The Economics of Poverty: An American Paradox (Englewood Cliff: Prentice-Hall, 1965); George H. Hildebrad, Poverty, Income Maintenance, and the Negative Income Tax (Ithaca, NY: Cornell University Press, 1968); and Helen O. Nichol, "Guaranteed Income Maintenance: Negative Income Tax Plans," Welfare in Review 4, no. 4 (April 1966).

[459]Paul N. Ylvisaker (1921-1992); assistant professor, Swarthmore College, 1948-55; executive secretary to the Mayor of Philadelphia, 1954-55; associate director, Public Affairs Program, Ford Foundation, 1955-58; director, Public Affairs Program, Ford Foundation, 1958-67; commissioner, New Jersey Department of Community Affairs, 1967-70; professor, Harvard University, 1972-92. For biographical information, see Obituary, Journal of the American Planning Association 58 (Summer 1992): 367; Obituary, New York Times Biographical Service, vol. 23 (March 1992), p. 329; Obituary, Time 139 (30 March 1992): 53; Contemporary Authors, vol. 16, new revision series (Detroit: Gale Research Co., 1986); and Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[460]The following account of the Ford Foundation "Grey Areas" programs is largely from Daniel P. Moynihan, Maximum Feasible Misunderstanding; and James L. Sundquist, "Origins of the War on Poverty," in idem. On Fighting Poverty: Perspectives from Experience (New York: Basic Books, 1969): 6-33. Interestingly, the term "Gray Areas" was also used during the 1950s in international relations to refer to what is now refered to as the "third world" or underdeveloped world. See William Kaufmann, The McNamara Strategy, 63.

[461]Edward J. Logue (1921-); development administrator, City of New Haven, 1954-60; development administrator, City of Boston, 1961-67; president, New York State Urban Development Corporation, 1968-75; president, Logue Development Corporation, 1976-present. For biographical information, see Carleton Knight, "Ed Logue: Hard-Nosed Houser," Architecture 74 (July 1985): 60-61; Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984); and New York Times Biographical Edition, vol. 1 (New York: Arno Press, 1970).

[462]Daniel P. Moynihan, Maximum Feasible Misunderstanding, 42.

[463]The following discussion of Mobilization for Youth, Inc., is from Daniel P. Moynihan, Maximum Feasible Misunderstanding.

[464]Richard A. Cloward (1926-); professor, Columbia University, 1954-present; director of research, Mobilization for Youth, Inc., 1958-65; numerous government advisory positions. For biographical information, see Contemporary Authors, vols. 41-44, first revision (Detroit: Gale Research Co., 1979); and Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[465]Lloyd E. Ohlin (1918-); professor, Columbia University, 1956-67; professor, Harvard University, 1967-present. For biographical information, see Contemporary Authors, vol. 104 (Detroit: Gale Research Co., 1982); and Current Biography Yearbook, 1963 (New York: H. W. Wilson Co., 1963).

[466]Richard A. Cloward and Lloyd E. Ohlin, Delinquency and Opportunity (Glencoe, IL: The Free Press, 1960).

[467]Mobilization for Youth, Inc., A Proposal for the Prevention and Control of Delinquency by Expanding Opportunities (New York: Mobilization for Youth, Inc., 1961).

[468]For accounts of the PCJD, James L. Sundquist, "Origins of the War on Poverty," in idem. On Fighting Poverty: Perspectives from Experience (New York: Basic Books, 1969), 6-33; Richard Blumenthal, "Community Action: Origins of a Government Program," B.A. thesis, Harvard College, 1967; Daniel P. Moynihan, Maximum Feasible Misunderstanding: Community Action in the War on Poverty (New York: The Free Press, 1969); and Stephen M. Rose, The Betrayal of the Poor: The Transformation of Community Action (Cambridge, MA: Schenkman Publishing, 1972).

[469]Robert F. Kennedy (1925-68); Attorney General, 1961-64; U.S. Senator from New York, 1965-68. For biographical information, see Jeffrey Shulman, Robert Kennedy: In His Own Words (New York: Bantam Books, 1988); Arthur M. Schlesinger, Robert Kennedy and His Times (Boston: Houghton Mifflin, 1978); Jean Stein, American Journey: The Times of Robert Kennedy (New York: Harcourt Brace Jovanovich, 1970); Contemporary Authors, vol. 1, new revision series (Detroit: Gale Research Co., 1981); and Nelson Lichtenstein ed., Political Profiles, The Kennedy Years (New York: Facts on File, 1976); and Obituaries on File (New York: Facts on File, 1979).

[470]Daniel P. Moynihan, Maximum Feasible Misunderstanding, 64.

[471]James L. Sundquist, "Origins of the War on Poverty," in idem. On Fighting Poverty: Perspectives from Experience (New York: Basic Books, 1969), 19.

[472]Ibid., 11.

[473]The "guerrillas" included Frederick O'Reilly Hayes, then Assistant Commissioner of Program Planning for Urban Renewal at the Housing and Home Finance Agency, Lloyd Ohlin, Sanford Kravitz, Richard Boone, and William Lawrence, a PCJD committee staff member.

[474]For scholarship on the origins of the Community Action Program, see Peter Marris and Martin Rein, The Dilemmas of Social Reform (New York: Atherton Press, 1967); Daniel P. Moynihan, Maximum Feasible Misunderstanding: Community Action in the War on Poverty (New York: The Free Press, 1969); John G. Wofford, "The Politics of Local Responsibility—Administration of the Community Action Program, 1964-1966," in On Fighting Poverty, ed. James L. Sundquist (New York: Basic Books, Inc., 1969); Sanford L. Kravitz, "Community Action Programs: Past, Present, Its Future," in On Fighting Poverty, ed. James L. Sundquist (New York: Basic Books, Inc., 1969); John C. Donovan, The Politics of Poverty (New York: Western Publishing Company, 1967); and Kenneth B. Clark and Jeannette Hopkins, A Relevant War Against Poverty: A Study of Community Action Programs and Observable Social Change (New York: and Evanston, IL: Harper and Row, 1969); David A. Grossman, "The CAP: A New Function for Local Government," in Urban Planning and Social Policy, ed. Bernard J. Frieden and Robert Morris (New York: Basic Books, 1968); and Sar Levitan, The Great Society's Poor Law: A New Approach to Poverty (Baltimore: Johns Hopkins University Press, 1969).

[475]Sanford L. Kravitz, "Community Action Programs: Past, Present, Its Future," in On Fighting Poverty, ed. James L. Sundquist (New York: Basic Books, Inc., 1969), 56.

[476]Conference on the Kennedy Administration Urban Poverty Programs and Policies, transcript, 16-17 June 1973, Brandeis University, John F. Kennedy Library Oral History Collection, 244-245.

[477]William M. Capron (1920-); RAND staff member, 1951-56, and consultant, 1956-62, 1966-78; professor, Stanford University, 1956-62; senior staff member, President's Council of Economic Advisors, 1962-64; assistant director, Bureau of the Budget, 1964-65; senior fellow, Brookings Institution, 1966-69. For biographical information, see Contemporary Authors, vols. 29-32, first revision (Detroit: Gale Research Co., 1978).

[478]Ibid., 144-145.

[479]Daniel P. Moynihan, Maximum Feasible Misunderstanding, 169.

[480]William B. Cannon (1920-); budget examiner, Bureau of the Budget, 1951-54, 1959-62; assistant chief, BOB office of legislation for H.E.W. programs, 1962-65; chief, BOB manpower and science division, 1965-67. For biographical information, see Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[481]Charles L. Schultze (1924-); member, President's Council of Economic Advisors, 1952, 1954-58; 1977-81; professor, University of Maryland, 1961-87; assistant director, Bureau of the Budget, 1962-64; director, Bureau of the Budget, 1965-67; senior fellow, Brookings Institution, 1968-76, 1981-present. For biographical information, see Contemporary Authors, vol. 114 (Detroit: Gale Research Co., 1985); Current Biography Yearbook, 1970 (New York: H. W. Wilson Co., 1970); Nelson Lichtenstein ed., Political Profiles, The Johnson Years (New York: Facts on File, 1976); Who's Who in Government, 3rd ed. (Chicago: Marquis Who's Who, 1977); and Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[482]William Cannon, Bureau of the Budget, to P. S. Hughes, memorandum, "A Proposed Approach to the Poverty Problem," 12 December 1963, Kermit Gordon Papers, Box 12, Poverty Folder, John F. Kennedy Library, pp. 1-2.

[483]Kermit Gordon (1916-1976); member, Council of Economic Advisors, 1961-62; director, Bureau of the Budget, 1962-65; vice president and president, Brookings Institution, 1965-76. For biographical information, see Nelson Lichtenstein ed., Political Profiles, The Kennedy Years (New York: Facts on File, 1976); and New York Times Biographical Service, vol. 5 (New York: Arno Press, 1974).

[484]Charles Schultze, Assistant Director of the Bureau of the Budget, to Kermit Gordon, Director of the Bureau of the Budget, memorandum, "Approach to the Poverty Problem," 17 December 1963, Kermit Gordon Papers, Box 12, Poverty Folder, John F. Kennedy Library.

[485]Conference on the Kennedy Administration Urban Poverty Programs and Policies, transcript, 16-17 June 1973, Brandeis University, John F. Kennedy Library Oral History Collection, 154.

[486]In fact, in late January, 1964, Charles L. Schultze recommended Paul Ylvisaker to President Johnson as a candidate for second in command of the prospective antipoverty agency and head of the community action program. Johnson, however, had another candidate in mind—Adam Yarmolinsky. Charles L. Schultze, Assistant Director, Bureau of the Budget, to William Moyers, Special Assistant to the President, memorandum, 30 January 1964, NARA, Records of the Bureau of the Budget, Entry 7N, Series 61.1a, Director's Office—Correspondence 1964, Box 118, Folder R1-6 Poverty Program, RG 51.

[487]Ibid., 153.

[488]James L. Sundquist, "Origins of the War on Poverty," in idem. On Fighting Poverty: Perspectives from Experience (New York: Basic Books, 1969), 22.

[489]James L. Sundquist (1915-); Deputy Under Secretary of Agriculture, 1963-65; senior fellow, Brookings Institution, 1965-85. For biographical information, see Contemporary Authors, vols. 29-32, first revision (Detroit: Gale Research Co., 1978); and Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[490]Quoted in Richard Blumenthal, "Community Action: Origins of a Government Program," B.A. thesis, Harvard College, 1967, 58-59.

[491]Daniel P. Moynihan, Maximum Feasible Misunderstanding, 81-82.

[492]R. Sargent Shriver (1915-); director, Peace Corps, 1961-64; director, Office of Economic Opportunity, 1964-68; U.S. Ambassador to France, 1968-70; special assistant to the President, 1965-68. For biographical information, see Robert A. Liston, Sargent Shriver: A Candid Portrait (New York: Farrar, Strauss, 1964); Nelson Lichtenstein ed., Political Profiles, The Johnson Years (New York: Facts on File, 1976); Who's Who in American Politics, 10th ed. (New York: R. R. Bowker Co., 1985); and Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[493]Quoted in Moynihan, Maximum Feasible Misunderstanding, 82.

[494]Ibid., 83.

[495]Conference on the Kennedy Administration Urban Poverty Programs and Policies, transcript, 16-17 June 1973, Brandeis University, John F. Kennedy Library Oral History Collection, 241.

[496]William B. Cannon, Bureau of the Budget, to Kermit Gordon, Director of the BOB, and Walter Heller, Chairman of the CEA, memorandum, "Shriver Poverty Program," 13 February 1964, Kermit Gordon Papers, Box 12, Poverty Folder, John F. Kennedy Library, p. 1.

[497]Daniel P. Moynihan, Maximum Feasible Misunderstanding, 82.

[498]Richard Blumenthal, "Community Action: Origins of a Government Program," B.A. thesis, Harvard College, 1967, 94.

[499]Adam Yarmolinsky, interviewed by Richard Blumenthal, February 9, 1967. Quoted in Richard Blumenthal, "Community Action: Origins of a Government Program," B.A. thesis, Harvard College, 1967, 91.

[500]Richard Blumenthal, "Community Action: Origins of a Government Program," B.A. thesis, Harvard College, 1967, 100.

[501]Quoted in John C. Donovan, The Politics of Poverty (New York: Western Publishing Company, 1967), 35.

[502]For example, a prospective OEO organization chart from 1964 in Yarmolinsky's papers places Yarmolinsky as Deputy Director. Anonymous, handwritten organization chart for poverty administration, no date (probably July 1964), Adam Yarmolinsky Papers, Box 87, OEO Poverty Task Force Folder, John F. Kennedy Library.

[503]For accounts of this incident, see Richard Blumenthal, "Community Action: Origins of a Government Program," B.A. thesis, Harvard College, 1967, 115-116; Daniel P. Moynihan, Maximum Feasible Misunderstanding, 91; and Rowland Evans and Robert Novak, "The Yarmolinsky Affair," Esquire 63 (February, 1965): 80-82, 122-123.

[504]Adam Yarmolinsky to Paul Ylvisaker, 6 October 1965, Adam Yarmolinsky Papers, Box 13, Chron File Oct-Dec 1965 Folder, John F. Kennedy Library, p, 2.

[505]Conference on the Kennedy Administration Urban Poverty Programs and Policies, transcript, 16-17 June 1973, Brandeis University, John F. Kennedy Library Oral History Collection, 254.

[506]See Richard Blumenthal, "Community Action: Origins of a Government Program," B.A. thesis, Harvard College, 1967, 23-27.

[507]Richard Blumenthal, "Community Action: Origins of a Government Program," B.A. thesis, Harvard College, 1967, 27.

[508]Jack T. Conway (1917-1998); assistant to the president, United Auto Workers, 1946-61; deputy administrator, Housing and Home Finance Administration, 1961-63; deputy director, Office of Economic Opportunity, 1964-65; executive director, Industrial Union Department, A.F.L.-C.I.O., 1965-68. For biographical information, see Nelson Lichtenstein ed., Political Profiles, The Johnson Years (New York: Facts on File, 1976); Who's Who in America, 37th ed., 1972-1973 (Chicago: Marquis Who's Who, 1972); and Obituary, New York Times, January 11, 1998.

[509]Jack Conway, interviewed by Richard Blumenthal, November 23, 1966, quoted in Richard Blumenthal, "Community Action: Origins of a Government Program," B.A. thesis, Harvard College, 1967, 122.

[510]Office of Economic Opportunity, Community Action Program Guide, vol. 1 (Washington, D.C.: G.P.O., February 1965), 7.

[511]Ibid.

[512]Richard Blumenthal eloquently expresses the revolutionary nature of the CAP policies implemented by Conway and his staff:

> The great defect in past programs, they thought, was that the method of providing services and funds deprived the poor of self-confidence, self-respect, a sense of identity and personal worth. It did this, in a very superficial sense, by establishing rules which forced the poor to prove their failure in society. . . . Despite references to self-help, the government justified the program as a humanitarian gesture. . . . But the rationale of the government would be the same: this was a worthy sacrifice which a wealthy country should be proud to make for its less fortunate citizens; and one which those less fortunate men and women should regard as an act of beneficence. The relationship of the government to the poor would still be that of donor to donee.
>
> The objective of the proponents who urged that the poor should participate in the program was to erase that relationship—to give these people the sense of being masters of their own destiny, instead of merely inert statistics at the mercy of a strange and distant government. The proponents did not want the poor to regard the program as a gift, or feel the obligation of expressing gratitude. This would be a program they could claim as their own. They would join in developing, implementing and administering it at the local level; and they would have no reason to feel beholden to anyone.

Richard Blumenthal, "Community Action: Origins of a Government Program," B.A. thesis, Harvard College, 1967, 134-135.

[513]William B. Cannon, Bureau of the Budget, to Charles L. Schultze, Director of the Bureau of the Budget, memorandum, "Community Action Program," 25 September 1965, NARA, Records of the Bureau of the Budget, Entry 7N, Series 61.1a, Director's Office—Correspondence 1964, Box 161, Folder R1-2 Office of Economic Opportunity, Folder No., 1965, RG 51, p. 2.

[514]Daniel P. Moynihan, Maximum Feasible Misunderstanding, 144.

[515]See David E. Bell, interview by Robert C. Turner, 11 July 1964, John F. Kennedy Library Oral History Collection, 76-77.

[516]Robert A. Levine, interview by Stephen Goodell, 26 February 1969, Santa Monica, CA, Lyndon B. Johnson Library Oral History Collection, tape 1, page 2.

[517]Joseph A. Califano, Jr. (1931-); special assistant to the General Counsel, Department of Defense, 1961-62; special assistant to the Secretary of the Army, 1962-63; General Counsel, Department of the Army; 1963-64; special assistant to the Secretary and Deputy Secretary of Defense, 1964-65; special assistant to the President, 1965-69; Secretary of Health, Education, and Welfare, 1977-79. For biographical information, see Who's Who in American Politics, 10th ed. (New York: R. R. Bowker Co., 1985); Nelson Lichtenstein ed., Political Profiles, The Johnson Years (New York: Facts on File, 1976); Contemporary Authors, vol. 2, new revision series (Detroit: Gale Research Co., 1981); and Who's Who in America, 49th ed., 1995 (Chicago: Marquis Who's Who, 1995).

[518]Joseph A. Califano, Jr., interview by Robert Hawkinson, 11 June 1973, Washington, D.C., Lyndon B. Johnson Library Oral History Collection, 4.

[519]Elmer B. Staats (1914-); executive assistant director, Bureau of the Budget, 1949-50; deputy director, Bureau of the Budget, 1950-53, 1958-66; Comptroller of the Currency, 1966-81. For biographical information, see Current Biography Yearbook, 1967 (New York: H. W. Wilson Co., 1967); Who's Who in Government, 3rd ed. (Chicago: Marquis Who's Who, 1977); and Who's Who in American Politics, 10th ed. (New York: R. R. Bowker Co., 1985).

[520]Labor and Welfare Division, Bureau of the Budget (Forrer, Turen, and Sutton), to Elmer B. Staats, Deputy Director of the Bureau of the Budget, memorandum, "Is there a Hitch in OEO's Future?" 8 October 1964, NARA, Entry 8B, Directors, Deputy Directors, and Assistant Directors Office Files, 1961-1967, Series 61.1b, Box 22, Office of Economic Opportunity Folder, RG 51.

[521]Ibid., 3-4.

[522]Ibid., 2.

[523]Office of Economic Opportunity, Community Action Program Guide (Washington, D.C.: Office of Economic Opportunity, 1964), 16.

[524]Richard Blumenthal, "Community Action: Origins of a Government Program," B.A. thesis, Harvard College, 1967, 27; and Daniel P. Moynihan, Maximum Feasible Misunderstanding, 102.

[525]William C. Selover, "The View from Capitol Hill: Harassment and Survival," in On Fighting Poverty: Perspectives from Experience, ed. James L. Sundquist (New York: Basic Books, 1969), 169.

[526]William Selover recalls, "The President had never intended the program to mobilize the poor and tap its spokesmen for the purpose of opposing either local or federal political organizations, or both. But that is, in fact what happened." William C. Selover, "The View from Capitol Hill: Harassment and Survival," in On Fighting Poverty: Perspectives from Experience, ed. James L. Sundquist (New York: Basic Books, 1969), 169.

[527]Conference on the Kennedy Administration Urban Poverty Programs and Policies, transcript, 16-17 June 1973, Brandeis University, John F. Kennedy Library Oral History Collection, 79.

[528]Johnson's depiction of the CAP staff members is from Robert A. Levine, interview by Stephen Goodell, 26 February 1969, Santa Monica, CA, Lyndon B. Johnson Library Oral History Collection, tape 1, p. 29.

[529]Daniel P. Moynihan, Maximum Feasible Misunderstanding, 143.

[530]William C. Selover, "The View from Capitol Hill: Harassment and Survival," in On Fighting Poverty: Perspectives from Experience, ed. James L. Sundquist (New York: Basic Books, 1969), 181; and Robert L. Lineberry and Ira Sharkansky, Urban Politics and Public Policy (New York: Harper & Row, 1971), 293-294.

[531]Daniel P. Moynihan, Maximum Feasible Misunderstanding, 144.

[532]Kermit Gordon, Director of Bureau of the Budget, to President Lyndon Johnson, memorandum, "Appointment of Assistant Director," 26 January 1965, Ex FG 11-1/A, Box 55, White House Central Files, Lyndon B. Johnson Library.

[533]Henry S. Rowen, interview by David A. Hounshell and David Jardini, Stanford, CA, December 5, 1994, 12.

[534]Charles L. Schultze, Director of the Bureau of the Budget, to President Lyndon Johnson, memorandum, "National Goals," 13 August 1965, Ex FI, Box 1, FI Finance 12/1/64 - 8/25/65 Folder, White House Central Files, Lyndon B. Johnson Library, pp. 3-4.

[535]Joseph Califano to President Lyndon Johnson, memorandum, 16 August 1965, Ex FI, Box 1, FI Finance 12/1/64 - 8/25/65 Folder, White House Central Files, Lyndon B. Johnson Library.

[536]The adoption of PPB was required in the Departments of Agriculture, Commerce, Defense, H.E.W., Housing and Urban Development, Interior, Justice, Labor, the Post Office, State, and Treasury, and the Agency for International Development, the Atomic Energy Commission, the Central Intelligence Agency, the Federal Aviation Agency, the General Services Administration, N.A.S.A., the National Science Foundation, the Office of Economic Opportunity, the Peace Corps, the United States Information Agency, and the Veterans Administration. Additionally, a formal PPB system was encouraged in the Civil Aeronautics Board, the Civil Service Commission,

the Export-Import Bank of Washington, the Federal Communications Commission, the Federal Home Loan Board, the Federal Power Commission, the Federal Trade Commission, the Interstate Commerce Commission, the National Capital Transportation Agency, the National Labor Relations Board, the Railroad Retirement Board, the Securities and Exchange Commission, the Selective Service System, the Small Business Administration, the Smithsonian Institution, the Tennessee Valley Authority, and the United States Arms Control and Disarmament Agency.

[537]Quoted in Willard Fazar, presentation to the Institute for Applied Technology, U.S. Department of Commerce, "The Planning-Programming-Budgeting System," 20 December 1965, NARA, Records of the Bureau of the Budget, Entry 7N, Series 61.1a, Director's Office—Correspondence 1964, Box 134, Folder F3-1 Planning-Programming-Budgeting, 1965, RG 51, p. 2.

[538]William Gorham (1930-); RAND staff member, 1953-62; Deputy Assistant Secretary of Defense, 1962-65; Assistant Secretary of Health, Education, and Welfare, 1965-68; president, Urban Institute, 1968-present. For biographical information, see Who's Who in America, 49th ed., 1995 (Chicago: Marquis Who's Who, 1995).

[539]Robert A. Levine (1930-); RAND staff member, 1957-65, 1969-73, 1987-present; assistant director for research, plans, programs, and evaluation, Office of Economic Opportunity, 1966-69; president, New York City-RAND Institute, 1973-75; deputy director, Congressional Budget Office, 1975-79; vice president, System Development Corporation, 1979-85; president, Canyon Analysts, 1985-present. For biographical information, see Contemporary Authors, vol. 13, new revision series (Detroit: Gale Research Co., 1984).

[540]Robert A. Levine, interview by Stephen Goodell, 26 February 1969, Santa Monica, CA, Lyndon B. Johnson Library Oral History Collection, tape 1, p. 5.

[541]David Novick, ed., Program Budgeting (Cambridge: Harvard University Press, 1965).

Chapter 7

[542]Charles Carey, memorandum, "Impressionistic Consensus of Views," 26 October 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives, p. 1.

[543]Joseph A. Kershaw, sensitive information memorandum, "The Zuckert-LeMay Directives and RAND," 15 November 1961, Mary Anderson/Old Research Council/L. B. Rumph papers, Box 1, Organizational Changes Folder, RAND Archives; Albert Wohlstetter to Management Committee, memorandum, "RAND Program of Policy Research," 22 February 1960, Richard D. Specht papers, Lindblom binder, RAND Archives; David Novick to Frank Collbohm, memorandum, "RAND. What is it? What Makes it Worthwhile?" 19 June 1961, Brownlee Haydon Papers, Box 17, RAND Archives; Robert D. Specht to Research Council, memorandum, "The RAND Corporation: What and Why," 2 May 1961, Robert D. Specht Papers, Descriptions I Binder, RAND Archives; Malcolm W. Hoag, memorandum, "Why RAND?" 27 April 1961, Robert D. Specht Papers, Miscellaneous Files Box 2, RAND Archives; and John D. Williams to Research Council and Staff, memorandum, "The Balancing-RAND Syndrome," 11 July 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Research Council Organization Folder, RAND Archives.

[544]Paul Nitze, interview by Lt. Col. John N. Dick, Jr. and Dr. James C. Hasdorff, 25-28 October 1977, 19-20 May 1981, and 14-16 July 1981, Washington, D.C., Air Force Historical Research Center, Maxwell, AL; K239.0512-977, pp. 303-304.

[545]To a collection of essays on this topic, see William Kaufmann, ed., Military Policy and National Security (Princeton: Princeton University Press, 1956).

[546]Maxwell D. Taylor (1901-1987); U.S. Army Chief of Staff, 1955-59; military advisor to the President, 1961-62; chairman, Joint Chiefs of Staff, 1962-64; Ambassador to South Vietnam, 1964-66; special consultant to the President, 1965-69; president, Institute for Defense Analyses, 1966-69. For biographical information, see Maxwell D. Taylor, Swords and Plowshares (New York: Da Capo Press, 1990); Benjamin A. Frankel ed., The Cold War, 1945-1991, vol. 1 (Detroit: Gale Research Co., 1992), 478-479; John M. Taylor, General Maxwell Taylor: The Sword and the Pen (New York: Doubleday, 1989); Obituary, New York Times Biographical Service, vol. 18 (April 1987), 348-351; Obituary, Current Biography, vol. 48 (June 1987), 60; Obituary, Newsweek 109 (4 May 1987): 86; Who's Who in America, 43rd ed., 1984-1985, 2 vols. (Chicago: Marquis Who's Who, 1984); Contemporary Authors, vol. 111 (Detroit: Gale Research Co., 1984); and Nelson Lichtenstein ed., Political Profiles, The Kennedy Years (New York: Facts on File, 1976).

[547]Maxwell Taylor, The Uncertain Trumpet (New York: Harper & Row, 1959).

[548]Kennedy's dedication to ideas of flexible response and increased American non-nuclear capabilities is discussed in Bernard Brodie, "The McNamara Phenomenon," World Politics 17, no. 4 (July, 1965): 677; and William Donald Briggs, "John F. Kennedy and the Formation of Limited War Policy, 1952-1961: 'Outsiders' as a Factor in Decision-making," Ph.D. diss., George Washington University, 1989.

[549]J. Richard Goldstein, RAND vice president, 1948-74, and consultant, 1974-92.

[550]Edwin Mattison McMillan (1907-1991); professor, University of California at Berkeley, 1932-91; staff member, Lawrence Radiation Laboratory, 1934-91; associate director and director, Lawrence Radiation Laboratory, 1954-73. For biographical information, see Glenn T. Seaborg, "Edwin Mattison McMillan," American Philosophical Society Proceedings 137 (June 1993): 285-291; Obituary, Physics Today 45 (February 1992): 118-119; Obituary, Nature 353 (17 October 1991): 602; American Men and Women of Science, Physical and Biological Sciences, 15th ed., 7 vols. (New York: R. R. Bowker Co., 1982); Webster's American Biographies, 1979 ed. (Springfield, MA: G. & C. Merriam Co., 1978); Oxford Companion to American History (New York: Oxford University Press, 1966); and Who's Who in America, 43rd ed., 1984-1985 (Chicago: Marquis Who's Who, 1984).

[551]J. R. Goldstein to Edwin McMillan, 6 October 1961, Edwin McMillan Papers, Series XV, RAND Corporation Board Papers, 1954-73, Box 2, Folder 12, National Archives Branch Depository, San Bruno, CA, RG 326, p. 3.

[552]Roswell Gilpatric (1906-); partner, Cravath, Swaine and Moore, 1931-51, 1953-61, 1964-77; chairman, board of trustees, Aerospace Corporation, 1960-61; Assistant Secretary of the Air Force-Materiel, 1951; Under Secretary of the Air Force, 1951-53; Deputy Secretary of Defense, 1961-64. For biographical information, see Benjamin A. Frankel ed., The Cold War, 1945-1991, vol. 1 (Detroit: Gale Research Co., 1992), 189-190; Nelson Lichtenstein ed., Political Profiles, The Kennedy Years (New York: Facts on File, 1976); and Who's Who in America, 43rd ed., 1984-1985, 2 vols. (Chicago: Marquis Who's Who, 1984).

[553]Complete Minute Books, RAND Board of Trustees Semi-Annual Meeting Minutes, 1959-1970, Office of the Corporate Secretary, The RAND Corporation; and Lt. Col. John Dailey, talking paper, 12 August 1961, Curtis E. LeMay Papers, Box B-127, "RAND, 1961" Folder, Library of Congress.

[554]Anonymous, essay, "A Brief Survey of RAND's Non-Air Force Work," 3 October 1962, Miscellaneous Files From Washington Office Vault Box, RAND Archives, p. 3.

[555]Management Committee Meeting Minutes, 31 August 1960, Brownlee Haydon Papers, Box 17, Introspection Folder, RAND Archives, pp. 4-5.

[556]Research Council Meeting Minutes, 4 August 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Research Council Minutes and Agendas 1960-63 Folder, RAND Archives.

[557]Lt. Col. John Dailey, talking paper, 12 August 1961, Curtis E. LeMay Papers, Box B-127, "RAND, 1961" Folder, Library of Congress, pp. 2-3.

[558]Complete Minute Books, RAND Board of Trustees Semi-Annual Meeting Minutes, 1959-1970, Office of the Corporate Secretary, The RAND Corporation.

[559]Ibid.

[560]This topic it explored in greater detail in chapters 4 and 5.

[561]Lawrence J. Henderson, essay, "Recent Inquiries into and Studies of Non-Profit Corporations," 27 November 1961, Miscellaneous Files From Washington Office Vault Box, RAND Archives, p. 2.

[562]House Report 574, Defense Appropriations Bill, 1962, 87th Congress, 1st session, June 23, 1961, 61-62. Also, Lawrence J. Henderson, essay, "Recent Inquiries into and Studies of Non-Profit Corporations," 27 November 1961, Miscellaneous Files From Washington Office Vault Box, RAND Archives, pp. 2-3.

[563]Smith, The RAND Corporation, 1.

[564]The primary nonprofit contractors used by each of these bodies were the following.

Army: Research Analysis Corporation, Human Resources Research Office.

Navy: The Center for Naval Analysis

Air Force: Aerospace, Lincoln Laboratory, RAND, Analytic Services, Inc., System Development Corporation, Electromagnetic Compatibility Analysis Center, MITRE Corporation.

Office of the Secretary of Defense: Institute for Defense Analysis and, by the mid-1960s, Logistics Management Institute and Hudson Institute.

Also, Claude Witze reported at this time that NASA was also considering the creation of a nonprofit organization to "help mobilize scientific skills." See Claude Witze, "'Nonprofits'—Who's Got a Better Way?,"

Air Force and Space Digest 44, no. 11 (December 1961): 78-83.

[565]For discussion of the creation of Aerospace Corporation, see Clarence H. Danhof, Government Contracting and Technological Change (Washington, D.C.: The Brookings Institution, 1968), 110; and Air Force Ballistic Missile Management (Formation of Aerospace Corporation), Report by the Committee on Government Operations, House Report No. 324, 87th Congress, 1st sess., May 1, 1961. According to hearings for fiscal year 1962 budgeting before the Defense Subcommittee of the House Committee on Appropriations, the Air Force planned to continue funding TRW's subsidiary, Space Technology Laboratories, for SE/TD work on the Atlas, Titan and Minuteman missile programs until the current contracts were phased out. The new Aerospace Corporation would immediately assume such responsibilities for the Samos, Midas, Discoverer, Dyna-Soar, Saint and Nike-Zeus programs. See Department of Defense Appropriations for 1962, Hearings before the Subcommittee of the Committee on Appropriations, part 3, House of Representatives, 87th Congress, 1st sess., pp. 129-131.

[566]For a history of Ramo-Wooldridge, Inc., and its successor corporation, TRW, Inc., see Simon Ramo, The Business of Science: Winning and Losing in the High-Tech Age (New York: Hill and Wang, 1988).

[567]For an excellent overview of the criticisms lodged against nonprofit contracting to mid-1961, see Air Force Ballistic Missile Management (Formation of Aerospace Corporation), Report by the Committee on Government Operations, House Report No. 324, 87th Congress, 1st sess., May 1, 1961.

[568]David E. Bell (1919-); director, Bureau of the Budget, 1961-62; administrator, Agency for International Development, 1962-66; vice president and executive vice president, Ford Foundation, 1966-president. For biographical information, see Nelson Lichtenstein ed., Political Profiles, The Johnson Years (New York: Facts on File, 1976).

[569]The committee comprised Robert S. McNamara, Secretary of Defense; Glenn T. Seaborg, Chairman of the Atomic Energy Commission; James E. Webb, Administrator, National Aeronautics and Space Administration; Alan T. Waterman, Director of the National Science Foundation; John W. Macy, Jr., Chairman of the Civil Service Commission; Jerome B. Wiesner, Special Assistant to the President for Science and Technology; and David E. Bell (Chairman), Director of the Bureau of the Budget.

[570]Max Golden (1913-); Deputy Assistant Secretary of the Air Force-Materiel, 1953-58; General Counsel, Department of the Air Force, 1958-62; assistant to the president, General Dynamics Corporation, 1963-64. For biographical information, see Who's Who in America, 43rd ed., 1984-1985, 2 vols. (Chicago: Marquis Who's Who, 1984).

[571]The Air Force efforts to establish policy guidelines for nonprofit contractors are detailed in History, Deputy Chief of Staff/Research and Technology, Directorate of Development Planning, 1 July 1961 to 31 December 1961, DCS/R&D Collection, K140.01, Jul-Dec 1961, vol. 3, Project RAND Office, AFHRC, pp. 11-15.

[572]Eugene M. Zuckert, Secretary of the Air Force, memorandum, "Policies on Relations with Air Force Sponsored Nonprofit Corporations (Aerospace, Analytic Services, Mitre, RAND, System Development Corporation)," 22 September 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Box 1, Organizational Changes Folder, RAND Archives. This memorandum was published in entirety in Claude Witze, "'Nonprofits'—Who's Got a Better Way?," Air Force and Space Digest 44, no. 11 (December 1961): 78-83.

[573]Lawrence J. Henderson, essay, "Recent Inquiries into and Studies of Non-Profit Corporations," 27 November 1961, Miscellaneous Files From Washington Office Vault Box, RAND Archives, p. 5.

[574]Eugene M. Zuckert, Secretary of the Air Force, memorandum, "Policies on Relations with Air Force Sponsored Nonprofit Corporations (Aerospace, Analytic Services, Mitre, RAND, System Development Corporation)," 22 September 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Box 1, Organizational Changes Folder, RAND Archives, p.1.

[575]Lawrence J. Henderson, essay, "RAND and the Air Force: The Context of the Problem," 14 November 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives, p. 8.

[576]Vannevar Bush, Science the Endless Frontier: A Report to the President (Washington, D.C.: U.S. Government Printing Office, 1945).

[577]For a discussion of the increased government sponsorship of scientific research in the wake of Sputnik, see Roger Geiger, "Science, Universities, and National Defense, 1945-1970," Osiris 2nd series 7 (1992): 26-48; and Daniel Kevles, The Physicists: The History of the Scientific Community in Modern America (New York: Knopf, 1977).

[578]Gustave H. Shubert and L. B. Rumph to J. R. Goldstein, memorandum, "On Contingency Plans for RAND," 9 November 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Box 1, Organizational Changes Folder, RAND Archives, p. 4.

[579]Charles Carey, memorandum, "Impressionistic Consensus of Views," 26 October 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives.

[580]Eugene M. Zuckert to Curtis E. LeMay, memorandum, 19 October 1961, Department of the Air Force Collection, 168.7050-51, Folder "61/10/01 - 61/10/31", AFHRC. This review policy was reemphasized in July, 1962 in Eugene M. Zuckert, memorandum, "Non-Profit Contract Policy," July 1962, Papers of Curtis Emerson LeMay, Box B-128, "Air Force, Office of the Secretary of, July-Dec, 1962" Folder, Library of Congress.

[581]For an account of the meeting with Golden, see J. R. Goldstein to Edwin McMillan, 17 November 1961, Edwin McMillan Papers, Series XV, RAND Corporation Board Papers, 1954-73, Box 2, Folder 12, National Archives Branch Depository, San Bruno, CA, RG 326; and J. R. Goldstein to Edwin McMillan, 30 March 1962, Edwin McMillan Papers, Series XV, RAND Corporation Board Papers, 1954-73, Box 2, Folder 12, National Archives Branch Depository, San Bruno, CA, RG 326. Concerning the LeMay meeting, see J. R. Goldstein to Edwin McMillan, 17 November 1961, Edwin McMillan Papers, Series XV, RAND Corporation Board Papers, 1954-73, Box 2, Folder 12, National Archives Branch Depository, San Bruno, CA, RG 326; and Charles Carey, memorandum, "Impressionistic Consensus of Views," 26 October 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives.

[582]Frank L. Stanton (1906-); president, CBS, Inc., 1946-71; chairman, RAND board of trustees, 1961-67; RAND trustee, 1957-78. For biographical information, see interview with Arthur Unger, "Frank Stanton: Born to Indispensibility," Television Quarterly 27, no. 1 (1994): 2-17; interview with R. Bartos, "Frank Stanton: Our First CEO," Journal of Advertising Research 26 (February-March 1986): 43-46; and Joseph P. McKerns ed., Biographical Dictionary of American Journalism (Westport, CT: Greenwood Press, 1989).

[583]Charles Carey, memorandum, "Impressionistic Consensus of Views," 26 October 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives, pp. 5-7.

[584]Ibid., 6.

[585]Ibid., 7.

[586]In early November, L. J. Henderson, vice president and the chief of RAND's Washington Office, reported to the corporation's board of trustees that current Air Force leadership held the following opinions concerning RAND:

1. RAND was diversifying and catering to the Office of the Secretary of Defense, and other high level government circles, thus confusing or even opposing Air Force positions.
2. RAND researchers were unwilling to take the Air Force into their confidence concerning their talks with other potential clients.
3. The number of RAND or ex-RAND staffers in or near high government decision-making posts, combined with RAND's access to detailed Air Force plans and intelligence put the Air Force in an uncomfortable, often untenable position.
4. RAND employees were publishing papers and books that were often in opposition to Air Force policy, or contained statements that the Air Force would rather not have had published.
5. RAND scientists tended to become cynical and arrogant, particularly toward Air Force officers and Air Force decision makers when RAND ideas and recommendations were not accepted by the Air Force. Sometimes--perhaps even often--these individuals were seen as seeking non-Air Force channels to push for a reexamination of negative Air Force decisions.
6. RAND's research contributions and publications were not perceived as useful in the day-to-day or month-to-month problems of hard pressed Air Force officers.
7. RAND unduly resisted or ignored policy advice and control of Air Force officers responsible for RAND--leading to a feeling among Air Force officials that RAND was steadily alienating itself from them.
8. The amount of attention devoted by RAND's top researchers to Air Force problems was declining, and that this talent was being diverted to RAND's other contracts.
9. A general impression that RAND was getting "too big for its britches."
10. RAND should keep out of military strategy studies, which should be done by Air Force officers or in-house.

Lawrence J. Henderson, essay, "RAND and the Air Force: The Context of the Problem," 14 November 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives,

pp. 6-7.

[587]Charles Carey, memorandum, "Impressionistic Consensus of Views," 26 October 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives, p. 2.

[588]Joseph M. Goldsen to L. B. Rumph, memorandum, "Alternatives to New-Style Air Force Contract," 2 November 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives, p. 1.

[589]Charles Carey, memorandum, "Impressionistic Consensus of Views," 26 October 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives, p. 1.

[590]Herken, Counsels of War, p. 156.

[591]Smith, The RAND Corporation, p. 134.

[592]Interview, Eugene M. Zuckert by Lawrence E. McQuade, 18 April 1964, Washington, D.C., John F. Kennedy Library Oral History Collection.

[593]History, Deputy Chief of Staff/Development, Directorate of Development Planning, 1 January 1961 to 30 June 1961, DCS/R&D Collection, K140.01, Jan-Jun 1961, vol. 2, Project RAND Office, AFHRC, p. 14. This document notes that General Blanchard, Director of Operations, Headquarters SAC, asked that RAND give priority to development of "STRAP" by January, 1962.

[594]Systems Development and Management, Hearings before a Subcommittee of the Committee on Government Operations, (Holifield Subcommittee Hearings), House of Representatives, 87th Cong., 2nd Sess., part 4, August 1962, page 1537.

[595]RAND Board of Trustees Semi-Annual Meeting Minutes, Complete Minutes Books, RAND Corporate Archives. Minutes of the Special Meeting of the Executive Committee of the RAND Corporation, October 13, 1961.

[596]Management's appraisal of the consequences of compliance are taken from pages 3-9 of Joseph A. Kershaw, information memorandum, "The Zuckert-LeMay Directives and RAND," 15 November 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Box 1, Organizational Changes Folder, RAND Archives—a "Sensitive Information" talk for the Board of Trustees. This talk seeks ". . . to consider . . . the impact on The RAND Corporation and its research program of the Zuckert policy statement and LeMay's general views toward our research."(p. 3) Kershaw argues that by lessening the attractiveness of work at RAND, the directives will dramatically reduce the effectiveness of RAND as a research organization. Only 6 copies produced of this document were produce.

[597]Ibid., 3.

[598]Ibid., 4-5.

[599]Ibid., 5.

[600]Ibid., 9.

[601]Ibid., 14.

[602]Joseph Goldsen, RAND staff member, 1948-68, and consultant, 1947-48, 1968-73.

[603]David Novick (1906-1991); RAND staff member, 1949-71, and consultant, 1971-91. For biographical information, see New York Times Biographical Service, vol. 22 (November 1991), 1188; Obituary, New York Times, 9 November 1991, 12; and Contemporary Authors, vols. 33-36, 1st revision (Detroit: Gale Research Co., 1978).

[604]David Novick to L. B. Rumph, memorandum, "Some Possible Alternatives," 1 November 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives, p. 1.

[605]Systems Development and Management, Hearings before a Subcommittee of the Committee on Government Operations, (Holifield Subcommittee Hearings), House of Representatives, 87th Cong., 2nd Sess., part 3, page 952, 1962. Quoted in Smith, The RAND Corporation, 136.

[606]John D. Williams, "RAND?" RAND Document (Limited Distribution) D(L)-9446, 17 November 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Box 1, Organizational Changes Folder, RAND Archives, p. 17.

[607]Brockway McMillan (1915-); researcher, Bell Telephone Laboratories, 1946-61; director of military research, Bell Telephone Laboratories, 1959-61; Assistant Secretary of the Air Force for Research and Development, 1961-63; Under Secretary of the Air Force, 1963-65; executive director of military research, Bell Telephone Laboratories, 1965-69; vice president for military development, 1969-79.

[608]The content of this meeting and the recommendations that issued from it were reported to RAND's management in Lawrence J. Henderson, memorandum, "Recent Developments in Air Force-RAND Relations," 27 November 1961, Miscellaneous Files From Washington Office Vault Box, RAND Archives.

[609]Ibid., 3.

[610]A discussion of the nature and purpose of RAND's "Continuity Reserve" can be found in Anonymous, essay, "Exhibit 5, Continuity Reserve," 5 January 1962, Miscellaneous Files From Washington Office Vault Box, RAND Archives, p. 1.

[611]The special committee comprised Frank Stanton, Frederick .L. Anderson, Caryl P. Haskins, Edwin E. Huddleson, Jr., and David A. Shepard. RAND Board of Trustees Semi-Annual Meeting Minutes, Complete Minutes Books, RAND Corporate Archives. Minutes of the Meeting of the Board of Trustees of the RAND Corporation, 30 November - 1 December 1961, Complete Minute Books, RAND Board of Trustees Semi-Annual Meeting Minutes, 1959-1970, Office of the Corporate Secretary, The RAND Corporation, p. 2.

[612]Anonymous, essay, "Exhibit 5, Continuity Reserve," 5 January 1962, Miscellaneous Files From Washington Office Vault Box, RAND Archives.

[613]Anonymous, memorandum, "Exhibit 9: A Ceiling of the RAND Corporation's Size," 5 January 1962, Miscellaneous Files From Washington Office Vault Box, RAND Archives.

[614]The punitive nature of the Air Force funding cuts was further substantiated several weeks later by the head of RAND's Computer Science Department, Willis Ware. Ware reported that at a Scientific Advisory Board meeting he had a conversation with a former RAND staff member who was now working for Headquarters USAF. Ware reported that that person "insisted that it was no administrative oversight that the Air Force gave us 12M instead of 15M. He hinted that this was disciplinary action of the Air Force in return for our taking the ISA work. He insists that if we were to cancel ISA, the Air Force would offer to put an equal amount of money into our till for the same work." Willis Ware, memorandum of conversation with Air Force official, 1 December 1961, Miscellaneous Files From Washington Office Vault Box, RAND Archives.

[615]J. R. Goldstein to Edwin McMillan, 6 October 1961, Edwin McMillan Papers, Series XV, RAND Corporation Board Papers, 1954-73, Box 2, Folder 13, National Archives Branch Depository, San Bruno, CA, RG 326, p.2.

[616]The questions addressed by the Bell Committee are presented on pages 12-15 of the report.

[617]Adam Yarmolinsky (1922-2000); special assistant to the Secretary of Defense, 1961-64; deputy director, President's Task Force on Poverty, 1964; Principal Assistant Deputy Secretary of Defense-International Security Affairs, 1965-66; professor, Harvard Law School, 1966-72; RAND consultant, 1967-71; professor, University of Massachusetts, 1972-77; counselor, Arms Control and Disarmament Agency, 1977-79. For biographical information, see Contemporary Authors, vols. 37-40, 1st revision (Detroit: Gale Research Co., 1979); Who's Who in America, 43rd ed., 1984-1985, 2 vols. (Chicago: Marquis Who's Who, 1984); Current Biography Yearbook, 1969 (New York: H. W. Wilson Co., 1969); and Nelson Lichtenstein ed., Political Profiles, The Kennedy Years (New York: Facts on File, 1976).

[618]Yarmolinsky notes that "From January to June 1962 I was very much occupied with the Bell Committee." Adam Yarmolinsky, interview by Daniel Ellsberg, 28 November 1964, Washington, D.C., John F. Kennedy Library Oral History Collection, pp. 56-57. In preparing to draft the Bell Report, Yarmolinsky and his staff met in Santa Monica with RAND officials in January, 1962, to discuss the corporation's circumstances. J. R. Goldstein to Board of Trustees, 26 January 1962, Edwin McMillan Papers, Series XV, RAND Corporation Board Papers, 1954-73, Box 2, Folder 13, National Archives Branch Depository, San Bruno, CA, RG 326, p. 2.

[619]Adam Yarmolinsky, Special Assistant to the Secretary of Defense, to Roswell Gilpatric, memorandum, 20 February 1962, Adam Yarmolinsky Papers, Box 10, Folder "Chron File Jan-Mar 1962," John F. Kennedy Library, p. 2.

[620]U.S. Bureau of the Budget, "Report to the President on Government Contracting for Research and Development," 30 April 1962 (Washington: Government Printing Office, 1962), 30-31.

[621]Ibid., 30. For a more general discussion of the Bell Report findings, see Clarence H. Danhof, Government Contracting and Technological Change (Washington, D.C.: The Brookings Institution, 1968), 119-120. Danhof argues that the conclusions of the Bell Report supported the status quo in nonprofit contracting, but his analysis does not include the divergent interests of the Secretary of Defense and the Air Force at the time of the report.

[622]This summary of the special committee findings is taken from Anonymous, essay (probably component of Board of Trustees meeting background materials), "RAND Work for Agencies Other than Air Force," 30 March 1962, Edwin McMillan Papers, Series XV, RAND Corporation Board Papers, 1954-73, Box 6, Folder 38, National Archives Branch Depository, San Bruno, CA, RG 326, pp. 149-150.

[623]The events of this meeting are documented in History, Deputy Chief of Staff/Research and Technology, Directorate of Development Planning, 1 January 1962 to 30 June 1962, DCS/R&D Collection, K140.01, Jan-Jun

1962, vol. 3, Project RAND Office, AFHRC, p. 9; and RAND Board of Trustees Semi-Annual Meeting Minutes, Complete Minutes Books, RAND Corporate Archives. Minutes of the Meeting of the Board of Trustees of the RAND Corporation, April 12-14, 1962, p. 3.

[624]Max Golden, U.S.A.F. General Counsel, to Eugene M. Zuckert and Curtis E. LeMay, memorandum, 28 April 1962, Curtis E. LeMay Papers, Box B-127, "Chief Scientist, RAND, SAB- 1962" Folder, Library of Congress.

[625]Ibid.

[626]Ibid.

[627]Ibid.

[628]History, Deputy Chief of Staff/Research and Development, Directorate of Development Planning, 1 July 1962 to 31 December 1962, DCS/R&D Collection, K140.01, Jul-Dec 1962, vol. 3, Project RAND Office, AFHRC, pp. 6-7, 9.

[629]Ibid, 7.

[630]For a summary of the administrative changes made in RAND-Air Force relations designed to foster communication, see History, Deputy Chief of Staff/Research and Development, Directorate of Development Planning, 1 July 1962 to 31 December 1962, DCS/R&D Collection, K140.01, Jul-Dec 1962, vol. 3, Project RAND Office, AFHRC

[631]The content of the agreement is noted in History, Deputy Chief of Staff/Research and Development, Directorate of Development Planning, 1 January 1963 to 30 June 1963, DCS/R&D Collection, K140.01, Jan-Jun 1963, vol. 5, Project RAND Office, AFHRC, p. 9. The ambiguous meaning of the agreement is illustrated in comments made by Secretary Zuckert in a 1964 interview. Concerning RAND's non-Air Force work, Zuckert says, "we have an agreement, although it doesn't really say this. It means they won't go off doing extensive jobs for other people without checking with us first." Eugene M. Zuckert, interview by Lawrence E. McQuade, 18 April 1964, Washington, D.C., John F. Kennedy Library Oral History Collection, p135.

Chapter 8

[632]Maxwell D. Taylor, The Uncertain Trumpet (New York: Harper & Brothers, 1959).

[633]Douglas S. Blaufarb, The Counterinsurgency Era: U.S. Doctrine and Performance, 1950 to the Present (New York: The Free Press, 1977).

[634]Memorandum, Harold Brown to Secretary of the Air Force, "Limited Warfare RDT&E Funds," History--Hosmer Folder, RAND Classified Archives, p. 1.

[635]Ibid.

[636]Advanced Projects Research Agency, "Project AGILE, Southeast Asia Combat Development and Test Center Activities (AGILE)," 31 October 1961, National Archives, Records of the Joint Chiefs of Staff, JCS 1961, CCS 5224 "Advanced Research Projects Agency" Folder (23 May 1961) Part II, RG 218, p. 26.

[637]For accounts of the RDT&E field operations in Southeast Asia, see Advanced Research Projects Agency, U.S. Department of Defense, "Research, Development, Test and Evaluation Activities in Southeast Asia," 1 October 1961, History--Hosmer Folder, RAND Classified Library, and memorandum, T.E. Greene to RAND management committee, "ARPA Request for RAND Assistance on Project AGILE," 25 September 1961, History--Hosmer Folder, RAND Classified Library.

[638]Greene, "ARPA Request for RAND Assistance on Project AGILE," p. 2. For a description of the CDTC's early research and testing agenda, see memorandum, T.E. Greene to George Clement, "Study of Air Operations for USAF in Relation to Work on Project AGILE," 13 December 1961, History--Hosmer Folder, RAND Classified Library.

[639]Gregg Herken, Counsels of War, expanded ed. (New York: Oxford University Press, 1987), p. 171.

[640]For detailed descriptions of the Sierra methodology, see E.W. Paxson, War Gaming, RAND Research Memorandum RM-3489-PR (Santa Monica, CA: The RAND Corporation, 1963); and M.G. Weiner, "War Gaming Methodology," RAND Research Memorandum RM-2413-PR (Santa Monica, CA: The RAND Corporation, 1959).

[641] These assumptions were expressed with exceptional clarity in W.H. Hastings's 1962 historical appendix to RAND's Southeast Asian war games report, which is discussed in greater detail in Chapter Nine. W.H. Hastings, "Limited War Patterns: I, Southeast Asia (1963)," RAND Research Memorandum RM-2961-ISA

(Santa Monica, CA: The RAND Corporation, 1962).

[642]F.M. Sallagar, "A Political and Military Study of a Nuclear Limited War: A Project Back Stop Briefing," RAND Briefing B-159 (Santa Monica, CA: The RAND Corporation, 1959), p. 1.

[643]H.I. Ansoff, "Some Considerations of the Role of the U.S. Air Force in Limited War," RAND Research Memorandum RM-1856 (Santa Monica, CA: The RAND Corporation, 1957).

[644]Ibid., p. 5.

[645]This work is reported in Charles Wolf, Jr., "Economic Development and Mutual Security: Some Problems of U.S. Foreign Assistance Programs in Southeast Asia," RAND Research Memorandum RM-1778-RC (Santa Monica, CA: The RAND Corporation, 1956).

[646]Ibid., p. 6.

[647]Ibid., p. 20.

[648]See Paul G. Clark, "Military Assistance Policy in an Underdeveloped Country: Iran," RAND Research Memorandum RM-2416, April 1959; Charles Wolf, Jr., and Paul G. Clark, "Military Assistance Evaluation Study," RAND Briefing B-176, February 1960; and Charles Wolf, Jr., "Evaluation of Military Assistance in Underdeveloped Countries: A Case Study of Viet Nam," RAND Research Memorandum RM-2571, April 1960.

[649]Wolf and Clark, "Military Assistance Evaluation Study," pp. 28-30; and Wolf, "Evaluation of Military Assistance in Underdeveloped Countries: A Case Study of Viet Nam."

[650]See Charles Wolf, Jr., "Methods for Improving Coordination between Economic and Military Aid Programs," RAND Research Memorandum RM-3449-ISA, March 1963.

[651]Charles J. Zwick, et al., "U.S. Economic Assistance in Vietnam: A Proposed Reorientation," RAND Report R-430-AID (Santa Monica, CA: The RAND Corporation, 1964).

[652]Management Committee Meeting Minutes, 21 June 1961, RAND Archives.

[653]For a detailed discussion of RAND's program of research for ISA, see J.F. Digby and F.M. Whiteman, "RAND Research for the Assistant Secretary of Defense (International Security Affairs)," RAND Document D-11921-ISA, December 1963.

[654]Memorandum, J.W. Ellis, Jr., to Frank Collbohm, "Progress Report on Project AGILE--IV," 26 December 1962, History--Hosmer Folder, RAND Classified Library.

[655]Management Committee Meeting Minutes, 16 November 1962, RAND Archives, p. 2.

[656]John C. Donnell; professor, Temple University; RAND staff member, 1964-65, and consultant, 1961-64, 1965-72. For biographical information, see Contemporary Authors, vol. 41, 1st revision (Detroit: Gale Research Co., 1979).

[657]Joseph J. Zasloff (1925-); professor, University of Pittsburgh, 1954-present; Smith Mundt professor, University of Saigon, 1959-60; RAND staff member, 1964-65, 1966-67, and consultant, 1962-63, 1965-66, 1967-73. For biographical information, see Contemporary Authors, vol. 116 (Detroit: Gale Research Co., 1986); and Who's Who in America, 43rd ed., 1984-1985, 2 vols. (Chicago: Marquis Who's Who, 1984).

[658]"The Vietnamese Strategic Hamlets: A Preliminary Report," RAND Research Memorandum RM-3208, 1962.

[659]See, for example, Management Committee Meeting Minutes, 23 May 1962, RAND Archives.

[660]For an excellent treatment of the U.S. Air Force's concentration on strategic nuclear warfare, see Blaufarb.

[661]Alfred Goldberg, "RAND and Vietnam," RAND Document D-18749, April 1969, pp. 2-3.

[662]Goldberg, "RAND and Vietnam," p. 6.

[663]"Counterinsurgency and Air Power: Report of the RAND Ad Hoc Group," RAND Research Memorandum RM-3203, June 1962.

[664]Goldberg, "RAND and Vietnam," p. 7.

[665]Management Committee Meeting Minutes, 14 February 1962, RAND Archives.

[666]Management Committee Meeting Minutes, 25 July 1962, RAND Archives.

[667]For an account of Project Forecast, see Michael H. Gorn, Harnessing the Genie: Science and Technology Forecasting for the Air Force, 1944-1986 (Washington, D.C.: Office of Air Force History, 1988).

[668]The Pentagon Papers (New York: Bantam Books, 1971), p. 211.

[669]Ibid., p. 212.

[670]Herring, America's Longest War, pp. 132-133.

[671]Charles J. Zwick et al., "RAND's Southeast Asia Research Program," RAND Document D-13381, February 1965, p. i.

[672]Ibid., pp. 1-2.

[673]Memorandum, Robert L. Belzer to Frank Collbohm, 15 May 1964, quoted in Goldberg, "RAND and Vietnam," p. 17.

[674]For accounts of Collbohm's trip, see F. R. Collbohm, "Trip Report Part II: South Vietnam," April 29-May 5, RAND Document D-13815, June 1965; and F. R. Collbohm, "Trip Report Part IV: South Vietnam," May 14 - 16, RAND Document D-13817, June 1965.

[675]Collbohm, "Trip Report Part II," pp. 1-2.

[676]Ibid., p. 15.

[677]Ibid., p. 14.

[678]Goldberg, "RAND and Vietnam," p. 15.

[679]The following account of RAND's interdiction studies is from Goldberg, "RAND and Vietnam," pp. 18-25.

[680]C.V. Sturdevant, "The Border Control Problem in South Vietnam," RAND Research Memorandum RM-3967-ARPA, July 1964.

[681]L.P. Holliday, "Interdiction as a Way of Preventing a Communist Invasion of Southeast Asia," RAND Document D-12741-ISA, August 1964.

[682]Collbohm, "Trip Report Part II," pp. 2-4.

[683]G.C. Reinhardt and E.H. Sharkey, "Air Interdiction in Southeast Asia," RAND Research Memorandum RM-5283-PR, November 1967, p. v.

[684]Oleg Hoeffding, "Bombing of North Vietnam: An Appraisal of Economic and Political Effects," RAND Research Memorandum RM-5213-1-ISA, December 1966.

[685]For Shubert's account of the Vietnam Alternatives Study, see Shubert interview by Martin Collins, pp. 43-49.

[686]Gustave H. Shubert, "Summary Briefing on Vietnam Alternatives," RAND DRU-1819, February 1998 (originally published November 1968).

[687]Ibid., pp. 3-4.

[688]Ibid., p. 16.

[689]Herken, Counsels of War, p. 211.

[690]Shubert interview by Martin Collins, p. 44.

[691]Ibid., p. 48.

[692]Enthoven writes, "The Systems Analysis office did not have a prominent, much less a crucial, role in the Vietnam war. Prior to June 1965 it had no role at all, and afterward it was never closely involved with the development of strategy or operations. Such matters were largely outside its charter unlike the determination of peacetime force structures and the defense budget, in which the OSD staff was heavily involved, or even the determination of force deployments to Europe, which also involved OSD, decisions on force deployments to Vietnam were made largely by the President and the Secretary of Defense dealing directly with the U.S. military commander in Vietnam and the Joint Chiefs of Staff, with participation by only a few OSD civilians. The Systems Analysis office played no policy role in the decision to go into Vietnam, in the decision to bomb North Vietnam, in the determination of targets to be bombed, in the timing of bombing pauses, or in the development of strategy or tactics. It had no policy role in determining the over-all totals of men to send to Vietnam, or in figuring out what they should do when they got there." Alain C. Enthoven and K. Wayne Smith, How Much is Enough? Shaping the Defense Program, 1961-1969 (New York: Harper & Row, 1971), p. 270.

[693]Ibid.

[694]Robert S. McNamara, In Retrospect: The Tragedy and Lessons of Vietnam (New York: Times Books, 1995), pp. 321-323.

[695]Thomas C Schelling, The Strategy of Conflict (Cambridge: Harvard University Press, 1960). The quote is from Kaplan, Wizards of Armageddon, p. 330.

[696]Kaplan, Wizards of Armageddon, pp. 332-335.

[697]Shubert interview with Martin Collins, p. 51.

[698]Frank R. Collbohm, "Excerpts from a Statement by F.R. Collbohm, President of the RAND Corporation, Before the Military Operations Subcommittee of the House Committee on Government Operations", RAND Paper P-2800, August 1962, p. 5.

[699]William Leavitt, "RAND--The Air Force's Original 'Think Tank'," Air Force and Space Digest 50, no. 5 (May 1967), p. 106.

[700]Alfred Goldberg, "RAND and Vietnam II: Some Questions from the Record," RAND Document D-18811-PR, May 1969, p. 7.

Chapter 9

[701]For general histories of the Vietnam War, see Loren Bartiz, Backfire (New York, 1985); William J. Duiker, U.S. Containment Policy and the Conflict in Indochina (Stanford, CA, 1994); George C. Herring, America's Longest War: The United States and Vietnam, 1950-1975, 3rd ed. (New York: McGraw-Hill, 1996); Gary R. Hess, Vietnam and the United States: Origins and Legacy of a War (Boston, 1990); Stanley Karnow, Vietnam: A History (New York, 1983); Neil Sheehan, A Bright Shining Lie: John Paul Vann and America in Vietnam (New York, 1988); William S. Turley, The Second Indochina War: A Short History (New York, 1987); and Marilyn B. Young, The Vietnam Wars, 1945-1990 (New York, 1991). The present discussion of Vietnamese history also draws upon the lectures of Dr. Anthony A. McIntire.

[702]For accounts of the First Indochina War, see Lucien Bodard, The Quicksand War: Prelude to Vietnam (Boston, 1967); Bernard Fall, Street Without Joy (New York, 1972); Ellen Hammer, The Struggle for Indochina, 1945-1955 (Stanford, CA, 1966); and Edgar O'Ballance, The Indochina War, 1945-1954: A Study in Guerrilla Warfare (London, 1964).

[703]For accounts of the Geneva settlement, see James Cable, The Geneva Conference of 1954 on Indochina (New York, 1986); and Robert F. Randle, Geneva 1954: The Settlement of the Indochinese War (Princeton: Princeton University Press, 1969).

[704]Herring, 44-45.

[705]Dwight D. Eisenhower, Public Papers, 1954 (Washington, D.C., 1955), p. 384.

[706]For accounts of U.S. nation-building efforts in South Vietnam, see David Anderson, Trapped by Success: The Eisenhower Administration and Vietnam, 1953-1961 (New York, 1961; Ronald H. Spector, Advice and Support: The Early Years (Washington, D.C., 1983); and Robert H. Whitlow, U.S. Marines in Vietnam: The Advisory and Combat Assistance Era, 1954-1964 (Washington, D.C., 1976).

[707]For histories of the Vietnamese insurgency, see Douglas Pike, Viet Cong: National Liberation Front of South Vietnam, rev. ed. (Cambridge, MA, 1972); Jeffrey Race, War Comes to Long An: Revolutionary Conflict in a Vietnamese Province (Berkeley, CA, 1972); Carlyle Thayer, War by Other Means: National Liberation and Revolution in Viet-Nam (Boston, 1989); and James Trullinger, Village at War: An Account of Revolution in Vietnam (New York, 1980).

[708]Author's telephone conversation with Guy Pauker, 9 October 1998.

[709]W.H. Hastings, "Limited War Patterns: I, Southeast Asia (1963)," RAND Research Memorandum RM-2961-ISA (Santa Monica, CA: The RAND Corporation, 1962).

[710]Hastings, 52.

[711]Ibid., 53.

[712]For this account, see Hastings, pp. 54-55.

[713]Ibid., 62.

[714]Ibid., 63.

[715]Herring, xi.

[716]Author's telephone conversation with Guy Pauker, 9 October 1998.

[717]Herbert Goldhamer with Alexander L. George and E.W. Schnitzer, "Studies of Prisoner-of-War Opinions on Weapons Effectiveness (Korea)," RAND Research Memorandum RM-733, December 1951.

[718]Goldhamer, "Studies of Prisoner-of-War Opinions on Weapons Effectiveness (Korea)," p. iv.

[719]Ibid., p. 6.

[720]This work was published within RAND as John C. Donnell, Guy J. Pauker, and Joseph J. Zasloff, "Viet Cong Motivation and Morale: A Preliminary Report," RAND Research Memorandum RM-4507-1-ISA, August 1965.

[721]Ibid., p. v.

[722]Ibid., p. vi.

[723]Ibid., p. 20.

[724]Ibid., p. 23.

[725]Ibid., p. 13.

[726]Ibid., p. 18.

[727]Ibid., p. 24.

[728]Guy J. Pauker, "Treatment of POWs, Defectors, and Suspects in South Vietnam," RAND Limited Document D(L)-13171-ISA, 8 December 1964, RAND Classified Library, p. 1.

[729]Ibid., pp. 2-3.

[730]Henry S. Rowen, interview by David A. Hounshell and David Jardini, Stanford, CA, December 5, 1994., p. 8.

[731]For an account of this decision, see Robert S. McNamara, In Retrospect: The Tragedy and Lessons of Vietnam (New York: Random House, 1995), 149-206.

[732]David Landau, "Behind the Policy Makers: RAND & the Vietnam War," Ramparts (November 1972): 25-42, 52-62.

[733]Charles J. Zwick et al., "RAND's Southeast Asia Research Program," RAND Document D-13381, February 1965, p. 4.

[734]Collbohm, "Trip Report Part IV," p. 5.

[735]David Landau, "Behind the Policy Makers: RAND and the Vietnam War," Ramparts (November 1972), 34.

[736]Leon Gouré, Civil Defense in the Soviet Union (Berkeley and Los Angeles: University of California Press, 1962). For Gouré's argument that the Soviet's purported construction of a civil defense network might likely be the harbinger of a surprise nuclear assault by the Soviets on the U.S., see pages 145-148.

[737]Donnell, Zasloff, and Pauker, "Viet Cong Motivation and Morale," p. 40.

[738]Leon Gouré, "Southeast Asia Trip Report, Part I: The Impact of Air Power in South Vietnam," RAND Research Memorandum RM-4400-PR (Part 1), December 1964.

[739]William F. Dorrill, "South Vietnam's Problems and Prospects: A General Assessment," RAND Research Memorandum RM-4350, 1964.

[740]Memorandum, William F. Dorrill to Joseph Goldsen and Guy Pauker, 11 January 1965, History--Hosmer Folder, RAND Classified Library, p. 7.

[741]W. Phillips Davison, User's Guide to the Rand Interviews in Vietnam, RAND Report R-1024-ARPA, March 1972, p. iii.

[742]F. R. Collbohm, "Trip Report Part II: South Vietnam," April 29-May 5, RAND Document D-13815, June 1965.

[743]Author's telephone conversation with Guy Pauker, 9 October 1998.

[744]Ibid.

[745]Teletype message, Leon Gouré to Lawrence J. Henderson, 28 April 1966, History--Hosmer File, RAND Classified Library.

[746]Memorandum, Leon Gouré to Joseph Goldsen, "Report to General Westmoreland on Behavior of ROK Troops," 29 December 1966, History--Hosmer Folder, RAND Classified Library.

[747]Ibid.

[748]Author's conversation with Gustave Shubert, 26 May 1998, Santa Monica, CA.

[749]Gustave H. Shubert, interview by Martin Collins, National Air and Space Museum, Washington, D.C., 20 May 1992, p. 40.

[750]Ibid., p. 41.

[751]See documents regarding Senator Fulbright's inquiry to Secretary of Defense Robert S. McNamarregarding suspected manipulation of data/results in RAND's Viet Cong motivation and morale studies, May 1966, History--Hosmer Folder, RAND Classified Library.

[752]Ibid.

[753]Author's conversation with Gustave Shubert, 26 May 1998, Santa Monica, CA.

[754]See, for example, Konrad Kellen, "A Profile of the PAVN Soldier in South Vietnam," RAND Research Memorandum RM-5013-ISA, June 1966; and Konrad Kellen, "A View of the VC: Elements of Cohesion in the Enemy Camp," RAND Research Memorandum RM-5462-ISA, October 1967.

[755]Guy J. Pauker, "What Can Be Done in South Vietnam? A Personal View," RAND Document D-13417-ISA, February 1965.

[756]Ibid., p. 3.

[757]Ibid., p. 7.

[758]Ibid., p. 8.

[759]Konrad Kellen to Leon Gouré et al., memorandum, "US/ARVN Shelling and Air Bombardment of Vietnamese," 30 September 1966, document in possession of Gustave H. Shubert.

[760]E.H. Sharkey, "Some Thoughts on RAND's Tactical Warfare Programs," RAND Document D-16251-PR, October 1967.

[761]Ibid., p. 46.

[762]Author's conversation with Peter Szanton, 9 June 1998.

[763]Shubert interview by Martin Collins, 20 May 1992, pp. 9-10. In Gustave Shubert's account of this event, animosity between him and the head of RAND's Social Science Department lead to their exchange of blows in the midst of a Management Committee meeting in 1965 or 1966. As Shubert recalls, when the fight broke out the two men were seated opposite one another at the corporation's conference table. Fortunately, the participants were seated at the widest part of the table and, despite their lunging efforts, were unable to make decisive contact with one another.

Chapter 10

[764]Daniel Ellsberg to Henry Rowen, memorandum, "Random Thoughts on RAND," 31 March 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives, p. 13.

[765]The decline of strategic studies at RAND is also noted in Gregg Herken, Counsels of War, p. 98.

[766]Panel discussion on the RAND Corporation during early 1960s, 27 January 1989, Smithsonian Video History, RAND Archives. Panel included moderator Gustave H. Shubert, Edward J. Barlow, Bruno Augenstein, Hans Speier, Burton Klein, Robert D. Specht, and Albert Wohlstetter.

[767]The departures of Albert Wohlstetter and Herman Kahn are especially associated with intense personal conflicts with Frank Collbohm. See Herken, Counsels of War, 98.

[768]This migration of the most "interesting" problems also occurred in matters scientific, a circumstance that also acted to RAND's detriment. The elevation of space exploration to the top of the national agenda and the creation of NASA contributed substantially to the decline of space studies at RAND. Edward Barlow, for example, left RAND in 1960 to join Aerospace Corporation and, later, NASA. Similarly, in commenting on his reasons for leaving RAND in 1959, physicist Bruno Augenstein remarked that by then "more and more interesting things were going on outside of the Air Force." Panel discussion on the RAND Corporation during early 1960s, 27 January 1989, Smithsonian Video History, RAND Archives. Panel included moderator Gustave H. Shubert, Edward J. Barlow, Bruno Augenstein, Hans Speier, Burton Klein, Robert D. Specht, and Albert Wohlstetter.

[769]For discussions of the evolution of strategic policy issues, see Bernard Brodie, Strategy in the Missile Age (Princeton: Princeton University Press, 1959); Thomas C. Schelling, The Strategy of Conflict (Cambridge: Harvard University Press, 1960); Thomas C. Schelling, Arms and Influence (New Haven, CT: Yale University Press, 1966); Lawrence Martin, ed. Strategic Thought in the Nuclear Age (London: Heinemann, 1979); Lawrence Freedman, The Evolution of Nuclear Strategy (New York: Macmillan, 1982); Gregg Herken, Counsels of War, expanded edition (New York: Oxford University Press, 1987); Fred Kaplan, The Wizards of Armageddon (New York: Simon and Schuster, 1983); Marc Trachtenberg, "Strategic Thought in America, 1952-1966," in idem., Writings on Strategy, 1961-1964, and Retrospective (New York: Garland Press, 1988): 443-484; David Goldfischer, The Best Defense: Policy Alternatives for U.S. Nuclear Security from the 1950s to the 1990s (Ithaca, NY: Cornell University Press, 1993); and Carl H. Builder, The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force (New Brunswick, NJ: Transaction Publishers, 1994).

[770]Gregg Herken notes that this position became painfully obvious in the circumstances surrounding the so-called "missile gap" that drew considerable public attention during the Nixon-Kennedy presidential campaign. Herken notes that RAND analysts who joined McNamara's staff had access to C.I.A. data that disproved the existence of the gap in September, 1961. Those individuals who remained at RAND, however, continued to believe in its reality for an extended period. Herken, Counsels of War, pp. 141-143.

[771]RAND's appreciation of this shift in strategic problems was stated very eloquently by game theorist Robert L. Belser in a statement written for the board of trustees on 5 March 1965. He wrote,

> The years following World War II saw develop in the United States an image of conflict depicting future war as an all-out thermonuclear exchange between the homelands of the U.S. and the USSR. Our perspective then changed to include a lesser class of conflicts, separate and distinct from strategic war, and characterized by limits of intention, geography, and violence. Obtaining forces equipped to fight a limited war—including, more recently counterinsurgency forces—appeared to fill out our military posture .

This image of local conflict gained increasing prominence; in fact, it moved from a subordinate rank in our concern to one that now challenges the strategic problem. It manifests itself, in particular, through our increased emphasis on conventional weapons, and on specially tailored forces. It reflects U.S. recognition that communist pressure will take many forms and seek many outlets all over the globe even if (or, perhaps, especially if) the communist powers are deterred from direct attack on the United States.

Lately we have come to recognize also that military problems arise from many circumstances other than Soviet hostility—we have other enemies, we have friends with problems and aspirations of their own, and we live in a world of emerging nations capable of erratic, unpredictable, and sometimes irresponsible behavior. Our military problems are not compartmentalized according to levels of violence, limits of intent, or geographic bounds. The posture we construct for the future must reflect in real terms the global nature of our interests and commitments, and the recognition that our strategic problem comprises all the actions we may have to take to protect and advance these interests.

RAND's studies of major military problems (e.g., strategic deterrence, air defense, etc.) have had their impact for several reasons. We introduced a new way of thinking about the allocation of resources and the choice of a solution in military problems. We were able to explore in a systematic fashion a number of alternative efficient solutions. This was particularly important because during the 1950's the world was polarized; because of gaps and instabilities in our deterrent capability and in our ability to meet and counter various threats, the risks were enormous and the payoffs from research were likewise great. The productivity of research was high because the solutions that emerged from the analyses were not intuitively obvious, but the problems could be described in terms that could be readily quantified (e.g., aircraft or missile speed, range, operating characteristics, etc.). Moreover, decisions on these problems were largely self-contained; they affected specific areas of military concern and initially they affected political and economic policy problems only peripherally.

The range of military problems is still with us and commands close and substantial attention, but the world of 1964 is different from the world of 1954 in a number of respects. The world has become multipolar; we are faced with "Nth country problems" not only in terms of the proliferation of nuclear capability but also in terms of choices of strategy. By now we have achieved some degree of stability in deterrence. The insecurities of potential instability have abated somewhat; more importantly the dimensions of the challenges and responses in national security policy have expanded to include, in a most essential way, economic and political aspects. Consequently there are additional complexities in the analysis of the problems and in the choices of policies.

Bob Belzer to Management Committee, Research Council, memoranda, "Trends in RAND Program," "New Areas of Research," and "Current Research on Underdeveloped Countries," 5 March 1965, J. R. Goldstein Papers, Correspondence on the Future of RAND 1960-65 Box, RAND Archives, pp. 1-3.

[772]Alain C. Enthoven, interview by William W. Moss, 4 June 1971, Washington, D.C., John F. Kennedy Library Oral History Collection, p. 22.

[773]Albert Wohlstetter, panel discussion on the RAND Corporation during early 1960s, 27 January 1989, Smithsonian Video History, RAND Archives. Wohlstetter's observation was echoed by Henry S. Rowen, interview by David A. Hounshell and David Jardini, Stanford, CA, December 5, 1994.

[774]Anonymous, memorandum attached to minutes of 19 January 1965 Research Council meeting, 18 January 1965, Mary Anderson/Old Research Council/L. B. Rumph Papers, Research Council Minutes and Agendas 1964-67 Folder, RAND Archives, p. 1.

[775]James F. Digby; RAND staff member, 1949-1986. For biographical information, see American Men and Women of Science, Physical and Biological Sciences, 15th ed., 7 vols. (New York: R. R. Bowker Co., 1982).

[776]James Digby, unpublished essay, "Systems Analysis at RAND 1948-1967," 20 July 1988, "History" Drawer, File Cabinet, RAND Archives, p. 1.

[777]Brownlee Haydon, "What Are We Doing Here?" RAND Document D-12463, January 1960, Victor Jackson Papers, Miscellaneous Historical Materials Box, RAND Archives, p. 6.

[778]Robert D. Specht to Management Committee and Research Council, "Some Prejudices About the Size and Character of RAND," 24 February 1965, Robert D. Specht papers, Lindblom binder, RAND Archives, p. 2.

[779]Charles E. Lindblom to Charles J. Hitch, memoranda, "Trends in RAND," "Limits on RAND's Effectiveness," "Interactions Among Decision Maker, Problem and Consultant," "Judgment and Partisanship," "RAND's Mission and Ambitions," and "Suggestions for the Administration of RAND," 16 December 1959, Robert D. Specht papers, Lindblom binder, RAND Archives.

[780]Robert D. Specht to Management Committee and Research Council, memorandum, "Notes on Some Patterns of Change at RAND," 3 October 1963, James Digby Papers, Box 5 "Declassified Memos, etc.," RAND Archives.

[781]This group was described as,

> meeting informally to compare our views on the problems of RAND as an effective Research Corporation, and, where possible, to come up with suggested solutions to these problems. The group is not a random collection of people, but rather has come together because of a common and sincere worry about and interest in RAND. This group includes people who have been at RAND for periods ranging from 3 to 14 years, represent three different departments, and hold positions ranging from department head to members of the research staff. Hence, in some sense, this group provides a cross section of RAND.

Anonymous (probably Robert D. Specht), memorandum, 26 July 1963, Robert D. Specht Papers, Miscellaneous Files, Grass Roots Critiques Folder, RAND Archives, p. 1.

[782]Anonymous (probably Robert D. Specht), memorandum, 26 July 1963, Robert D. Specht Papers, Miscellaneous Files, Grass Roots Critiques Folder, RAND Archives, pp. 3-4. For earlier but consonant statements on the growing fragmentation of RAND's research staff see also, Albert Wohlstetter to Management Committee, memorandum, "RAND Program of Policy Research," 22 February 1960, Robert D. Specht Papers, Lindblom binder, RAND Archives, especially pp. 45-50.

[783]John D. Williams to the Management Committee and Research Council, memorandum, "RAND's Self-Criticism," 19 September 1963, Victor Jackson Papers, Miscellaneous Historical Materials Box, RAND Archives p. 12.

[784]Frank Collbohm to all RAND personnel, memorandum "Organizational Changes," Mary Anderson/Old Research Council/L. B. Rumph Papers, Research Council Organization Folder, RAND Archives, p. 2.

[785]Research Council Meeting Minutes, 19 January 1965, Mary Anderson/Old Research Council/L.B. Rumph Papers, Research Council Minutes and Agendas 1964-1967 Folder, RAND Archives, p. 1.

[786]Anonymous (probably Robert D. Specht), memorandum, 26 July 1963, Robert D. Specht Papers, Miscellaneous Files, Grass Roots Critiques Folder, RAND Archives.

[787]David Novick to Management Committee and Research Council, memorandum, "More on RAND-Air Force Relations—What's Wrong?," 24 January 1962, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives, p. 1. Ironically, when President Johnson mandated the adoption of program budgeting by the civilian agencies of the federal government in 1965, Novick's book, Program Budgeting, became one of the largest selling RAND books of all time. David Novick. Program Budgeting: Program Analysis and the Federal Government (Cambridge: Harvard University Press, 1965).

[788]For literature on the Vietnam War, see Robert S. McNamara, In Retrospect: The Tragedy and Lessons of Vietnam (New York: Random House, 1995); Loren Baritz, Backfire: A History of How American Culture Led Us into Vietnam and Made Us Fight the Way We Did (New York: Morrow, 1985); Larry Berman, Lyndon Johnson's War: The Road to Stalemate in Vietnam (New York: Norton, 1989); Phillip B. Davidson, Vietnam at War: The History, 1946-1975 (Novato, CA: Presidio, 1988); Frances FitzGerald, Fire in the Lake: The Vietnamese and the Americans in Vietnam, 1972 ed. (New York: Vintage, 1989); James Gibson, The Perfect War: Technowar in Vietnam (Boston: Atlantic Monthly Press, 1986); George C. Herring, Jr., America's Longest War: The United States and Vietnam, 1950-1975, 2nd ed. (Philadelphia: Temple University Press, 1986); Stanley Karnow, Vietnam: A History, revised ed. (New York: Penguin, 1991); Guenter Lewy, America in Vietnam, 1978 ed. (New York: Oxford University Press, 1980); and John M. Newman, JFK and Vietnam: Deception, Intrigue, and the Struggle for Power (New York: Warner, 1992).

[789]Interestingly, the only period that exceeds the 1961-63 years in trustee turnover is the tumultuous period 1971-73 during which Henry Rowen's tenure ended and eleven trustees both came and went. During the 1961-63 period, the departing trustees were Charles Dollard, Lee A. DuBridge, H. Rowan Gaither, Jr. (deceased), Frederick F. Stephan, Philip M. Morse, George D. Stoddard, and Clyde E. Williams. All of these men had been RAND trustees since the corporation's founding in 1948. Taking their places on the board were Don K. Price, James A. Perkins, William R. Hewlett, Kenneth S. Pitzer, Michael Ference, Jr., T. Keith Glennan, and Lauris Norstad. In addition, two trustees joined the board either during or immediately prior to this period, Mark W. Cresap, Jr. (1960) and Philip Graham (1961), but the tenure of both ended prematurely with their deaths in 1963.

[790]Lee A. DuBridge (1901-1994); president, California Institute of Technology, 1946-69; science advisor to the President, 1969-70; RAND trustee, 1948-61; numerous government advisory positions. For biographic information, see Obituary, Physics Today 47 (October 1994), 85-86; New York Times Biographical Service, vol. 25 (New York: Arno Press, 1994), 125; Obituary, Current Biography 55 (March 1994), 61; Obituary, New York Times, 25 January 1994, B-8; American Men and Women of Science, Physical and Biological Sciences, 15th ed., 7 vols. (New York: R. R. Bowker Co., 1982); and Who's Who in America, 43rd ed., 1984-1985, 2 vols. (Chicago: Marquis Who's Who, 1984).

[791]Philip McCord Morse (1903-1985); professor, Massachusetts Institute of Technology, 1931-85; RAND trustee, 1948-62. For biographic information, see Obituary, Operations Research 34 (January-February 1986), 7-9; Obituary, Physics Today 39 (February 1986), 89-90; New York Times Biographical Service, vol. 16 (New York: Arno Press, 1985), 1081; Obituary, Current Biography, vol. 46 (November 1985), 45; and American Men and Women of Science, Physical and Biological Sciences, 15th ed., 7 vols. (New York: R. R. Bowker Co., 1982).

[792]Julius A. Stratton (1901-1994); professor, provost, vice president, chancellor, president, and president emeritus, Massachusetts Institute of Technology, 1928-1994; chairman, board of trustees, Ford Foundation, 1966-71; RAND trustee, 1955-65. For biographic information, see Obituary, New York Times, 24 June 1994, p. A25; Obituary, Current Biography Yearbook, 1994 (New York: H. W. Wilson Co., 1994); New York Times Biographical Service, vol. 25 (New York: Arno Press, 1994), 937; American Men and Women of Science, Physical and Biological Sciences, 15th ed., 7 vols. (New York: R. R. Bowker Co., 1982); and Current Biography Yearbook, 1963 (New York: H. W. Wilson Co., 1963).

[793]Newton N. Minow (1926-); chairman, Federal Communications Commission, 1961-65; RAND trustee, 1965-present; partner, Sidley and Austin, 1965-91; board of governors, Public Broadcasting Service, 1973-80. For biographic information, see Contemporary Authors, vols. 13-16, 1st revision (Detroit: Gale Research Co., 1975); The National Cyclopedia of American Biography, vol. N-63, (New York: J.T. White, 1984), 97-98; and Nelson Lichtenstein ed., Political Profiles, The Kennedy Years (New York: Facts on File, 1976).

[794]Don K. Price (1910-); staff member, Bureau of the Budget, 1945-46; deputy chairman, Department of Defense Research and Development Board, 1952-53; associate director and vice president, Ford Foundation, 1954-58; professor and dean, Kennedy School of Government, Harvard University, 1958-1980; RAND trustee, 1961-71. For biographic information, see Obituary, Current Biography 56 (September 1995), 58; Obituary, New York Times, 10 July 1995, D-11; Contemporary Authors, vols. 73-76 (Detroit: Gale Research Co., 1978); and Current Biography Yearbook, 1967 (New York: H. W. Wilson Co., 1967).

[795]Smith, The RAND Corporation, 185, n. 29.

[796]Edwin E. Huddleson, Jr. (1914-1995); member, Cooley, Godward, Castro, Huddleson, and Tatum, 1949-1995; RAND trustee, 1955-1984; Aerospace Corporation trustee, 1960-86; Mitre Corporation trustee, 1957-85. For biographic information, see New York Times Biographical Service, vol. 26 (New York: Arno Press, 1995), 636; Obituary, New York Times, 28 April 1995; and Who's Who in America, 43rd ed., 1984-1985, 2 vols. (Chicago: Marquis Who's Who, 1984).

[797]Adam Yarmolinsky, Special Assistant to the Secretary of Defense, to Edwin Huddleson, 16 October 1963, Adam Yarmolinsky Papers, Box 12, Folder "Chron File Oct-Dec 1963," John F. Kennedy Library; and Adam Yarmolinsky, Special Assistant to the Secretary of Defense, to Don K. Price, 30 October 1963, Adam Yarmolinsky Papers, Box 12, Folder "Chron File Oct-Dec 1963," John F. Kennedy Library. The quotation derives from the former document.

[798]Gustave H. Shubert, interview by Martin Collins, National Air and Space Museum, Washington, D.C., 20 May 1992, p. 60.

[799]Smithsonian Video History Panel Discussion moderated by Gustave Shubert. Panel discussion on RAND history during early 1960s. Panelists: B. Augenstein, E. Barlow, H. Speier, B. Klein, R. Specht, A. Wohlstetter. 27-Jan-89.

[800]Research Council Meeting Minutes, 2 March 1961, Mary Anderson/Old Research Council/L.B. Rumph Papers, Research Council Minutes and Agendas 1960-1963 Folder, RAND Archives, p. 2.

[801]Joseph M. Goldsen to L. B. Rumph, memorandum, "Alternatives to New-Style Air Force Contract," 2 November 1961, Mary Anderson/Old Research Council/L. B. Rumph Papers, Contingency Plans Folder, RAND Archives, p. 7.

[802]Daniel Ellsberg to Henry Rowen, memorandum, "Random Thoughts on RAND," 31 March 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives, p. 10.

[803]Anonymous (probably Robert D. Specht), memorandum, 26 July 1963, Robert D. Specht Papers, Miscellaneous Files, Grass Roots Critiques Folder, RAND Archives, p. 5.

[804]Anonymous (probably Robert D. Specht), memorandum, 26 July 1963, Robert D. Specht Papers, Miscellaneous Files, Grass Roots Critiques Folder, RAND Archives, p. 3.

[805]The result of the former project was J. A. Kershaw and R. N. McKean, "Decisionmaking in the Schools: An Outsider's View," January, 1960. P-1886, and the result of the latter was a RAND Research Memorandum, J. A. Kershaw and R. N. McKean, Teacher Shortages and Salary Schedules, RM 3009-FF, February 1962.

[806]This grant produced the following RAND research memoranda and papers: G. A. Hoffman, Automobiles--Today and Tomorrow, RAND Research Memorandum RM 2922-FF (Santa Monica: The RAND Corporation, November 1962); J. F. Fain, A Multiple Equation Model of Household Locational and Tripmaking Behavior, RAND Research Memorandum RM 3086-FF (Santa Monica: The RAND Corporation, April 1962); R. H. Haase, Decreasing Travel Time for Freeway Uses, RAND Research Memorandum RM 3099-FF (Santa Monica: The RAND Corporation, October 1962); G. A. Hoffman, Electric Motor Cars, RAND Research Memorandum RM 3298-FF (Santa Monica: The RAND Corporation, March 1963); J. H. Niedercorn and E. R. Hearle, Recent Land Use Trends in Forty Eight Large American Cities, RAND Research Memorandum RM 3664-1-FF (Santa Monica: The RAND Corporation, September 1963); C. J. Zwick, Models of Urban Change: Their Role in Urban Transportation Research, RAND Paper P-2651 (Santa Monica: The RAND Corporation, October 1962); C. J. Zwick, The Demand for Transportation Services in a Growing Economy, RAND Paper P-2682 (Santa Monica: The RAND Corporation, December 1962); and C. J. Zwick, Systems Analysis and Urban Planning, RAND Paper P-2754 (Santa Monica: The RAND Corporation, June 1963).

[807]This research was supported by an $88,000 grant from the Ford Foundation.

[808]Anonymous, memorandum, "RAND in Public Service," June 1969, Gustave H. Shubert Papers, Box 78-C-3, Organization 1969 Folder, RAND Archives, p. 13.

[809]While the Department of Defense was by far the largest user of nonprofit contractors, it was not alone in their use. During fiscal year 1962, for example, NASA, the Atomic Energy Commission (AEC), and the National Institutes of Health (NIH) also made considerable use of nonprofit contracting. In FY 1962, NASA let 46 contracts to nonprofit organizations with the total expenditure of $6.6 million. During this same period, the AEC had contracts with twelve nonprofit organizations, the estimated cost of which totaled $9.5 million (excluding the AEC contract with Associated Universities, Inc., for the operation of the Brookhaven Laboratory, which cost approximately $36 million). Also, NIH had 148 contracts with nonprofit organizations in fiscal 1962 involving a total expenditure of $9.0 million. Finally, the Department of Defense had nonprofit contracts during this year totaling well over $100 million. See, W. J. Armstrong, Bureau of the Budget, to Elmer B. Staats, Deputy Director of the BOB, memorandum, "Information on Government Contracts with Not-for-Profit Organizations other than Universities," 16 November 1962, NARA, Entry 8B, Directors, Deputy Directors, and Assistant Directors Office Files, 1961-67, Series 61.1b, Box 23, Folder "Research and Development-Contracts with Not-For-Profit Organizations, RG 51, p. 1-2.

[810]This position was contrary to Vannevar Bush's recommendations to President Harry Truman concerning the creation of independent, government-supported research institutions. See Vannevar Bush, Science the Endless Frontier: A Report to the President (Washington, D.C.: U.S. Government Printing Office, 1945).

[811]John W. Carley, memorandum, "Summary of Items Discussed at Conference of DoD Officials with the National Defense Committee of the U.S. Chamber of Commerce," 11 December 1963, Adam Yarmolinsky Papers, Box 12, Folder "Chron File Oct-Dec 1963," John F. Kennedy Library, p. 2

[812]U.S. House of Representatives, Subcommittee for Special Investigations of the Armed Services Committee, The Aerospace Corporation: A Study of Fiscal and Management Policy and Control (Washington, D.C.: G.P.O., 12 August 1965).

[813]J. R. Goldstein, memorandum, 3 July 1962, Edwin McMillan Papers, Series XV, RAND Corporation Board Papers, 1954-73, Box 3, Folder 18, National Archives Branch Depository, San Bruno, CA, RG 326, p.1.

[814]Eugene M. Zuckert, interview by Dr. George M. Watson, Jr., 3-5 and 9 December 1986, Washington, D.C., Air Force Historical Research Center, Maxwell, AL; K239.0512-1763, pp. 68-69.

[815]U.S. House of Representatives, Subcommittee for Special Investigations of the Armed Services Committee, The Aerospace Corporation: A Study of Fiscal and Management Policy and Control (Washington, D.C.: G.P.O., 12 August 1965), p. 62

[816]Harold Brown (1927-); division leader, Lawrence Radiation Laboratory, University of California at Berkeley, 1950-60; director, Lawrence Livermore Laboratory, 1960-61; Director of Defense Research and Engineering, 1961-65; Secretary of the Air Force, 1965-69; president, California Institute of Technology, 1969-77; Secretary of Defense, 1977-81. For biographic information, see Benjamin A. Frankel ed., The Cold War,

1945-1991, vol. 1 (Detroit: Gale Research Co., 1992), 59-65; American Men and Women of Science, Physical and Biological Sciences, 15th ed., 7 vols. (New York: R. R. Bowker Co., 1982); and Current Biography Yearbook, 1977 (New York: H. W. Wilson Co., 1977).

[817]Quoted in Henry S. Rowen to Richard N. Perle, Professional Staff Member, Subcommittee on National Security and International Operations, Senate Committee on Government Operations, memorandum, 17 March 1971, Donald B. Rice Papers, Box 2, H. S. Rowen Materials Folder, RAND Archives.

[818]History, Deputy Chief of Staff/Research and Development, Directorate of Operational Requirements and Development Plans, 1 January 1965 to 30 June 1965, , DCS/R&D Collection, K140.01, Jan-Jun 1965, vol. 2, Project RAND Office, AFHRC, p. 18.

[819]Ibid., 19.

[820]These Management Committee meetings were held on February 4 and 10, 1965. The agenda for the first meeting appears to have been shaped largely by a series of six questions revolving around RAND's potential diversification that were authored by Joseph Goldsen. See J. R. Goldstein to Management Committee, memorandum, "Size of RAND," 2 February 1965, Brownlee Haydon Papers, Box 17, Whither RAND Folder, RAND Archives. Only the minutes of the first meeting have been recovered--these are included in Robert W. Buchheim, notes taken at 3 February 1965 Management Committee meeting, 10 February 1965, J. R. Goldstein Papers, Correspondence on the Future of RAND 1960-65 Box, RAND Archives; and Robert W. Buchheim to Frank Collbohm, memorandum, 4 February 1965, J. R. Goldstein Papers, Correspondence on the Future of RAND 1960-65 Box, RAND Archives.

[821]A list of these memoranda is included in Richard Schamberg to Hans Speier, memorandum, "Concensus (sic): Growth? --Almost," 15 March 1965, Robert D. Specht Papers, Lindblom Binder, RAND Archives.

[822]Ted Harris to Hans Speier, memorandum, "The Future," 5 March 1965, J. R. Goldstein Papers, Correspondence on the Future of RAND 1960-65 Box, RAND Archives.

[823]Willis Ware to L. B. Rumph, memorandum, 4 March 1965, J. R. Goldstein Papers, Correspondence on the Future of RAND 1960-65 Box, RAND Archives, p. 1.

[824]Research Council Meeting Minutes, 2 March 1965, Mary Anderson/Old Research Council/L.B. Rumph Papers, Research Council Minutes and Agendas 1964-1967 Folder, RAND Archives, p. 1.

[825]Bob Belzer to Management Committee, Research Council, memoranda, "Trends in RAND Program," "New Areas of Research," and "Current Research on Underdeveloped Countries," 5 March 1965, J. R. Goldstein Papers, Correspondence on the Future of RAND 1960-65 Box, RAND Archives.

[826]Ibid., 6.

[827]For an account of the Project Camelot affair, see Irving Lewis Horowitz, The Rise and Fall of Project Camelot: Studies in the Relationship between Social Science and Practical Politics (Cambridge: The M.I.T. Press, 1967).

[828]Colonel G. I. Gore, U.S.A.F., Chief, RAND/ANSER Project Group, memorandum, 24 September 1965, Miscellaneous Files from Washington Office Vault Box, RAND Archives.

[829]Frank Collbohm to George K. Tanham, memorandum, "Your WM-453 On Request from the Office of the Commissioner of Education," 16 June 1965, Mary Anderson/Old Research Council/L.B. Rumph Papers, Research Council Minutes and Agendas 1964-1967 Folder, RAND Archives.

[830]Ibid.

[831]Complete Minute Books, RAND Board of Trustees Semi-Annual Meeting Minutes, 1959-1970, Office of the Corporate Secretary, The RAND Corporation.

[832]Frank Collbohm, interview with Joseph Tatarewicz and Martin Collins, Smithsonian Institution Oral History Project, Palm Desert, CA, 28 July 1987.

Chapter 11

[833]Henry Rowen's appointment to the presidency was officially effective January 1, 1967. However, his appointment was made public before the end of July 1966, and Rowen was already active in management activities, especially planning diversification strategy, by the middle of August.

[834]George H. Clement to Rowen, 28 October 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives, p. 2.

[835]Califano to President Johnson, memorandum, 21 November 1967, White House Central Files, FG 815, Executive Series, Box 427, folder "Institute for Urban Development," LBJ Library.

[836]Lyndon B. Johnson, Special Message to the Congress on the Nation's Cities, 2 March 1965, Public Papers of the Presidents of the United States, Lyndon Johnson, 1965, Book I (Washington, D.C.: Government Printing Office, 1966), pp. 231-240.

[837]89th Congress, 1st Session, Committee Print dated August 12, 1965.

[838]At the time, the Department of Defense was paying Aerospace Corporation a fee of 3.49 percent while RAND was paid 5.62 percent under Project RAND. Anonymously written minutes of conversations between Collbohm, Harold Brown, L. J. Henderson, and Stephen Shulman, 4 July 1966, Miscellaneous Files from Washington Office Vault Box, RAND Archives.

[839]The reconstruction of events surrounding the Project RAND contract negotiation is taken from Memorandum by Crawford C. Thompson, 30 January 1967, Miscellaneous Files fromWashington Office Vault Box, RAND Archives; J. R. Goldstein to RAND Corporation Executive Committee, memorandum, 2 August 1966, Miscellaneous Files fromWashington Office Vault Box, RAND Archives; Memorandum by L. J. Henderson, 27 July 1966, Miscellaneous Files fromWashington Office Vault Box, RAND Archives; J. S. King, Jr., to Commander, Air Force Office of Scientific Research, Office of Aerospace Research, 20 July 1966, Miscellaneous Files from Washington Office Vault Box, RAND Archives; Anonymously written minutes of conversations between Collbohm, Harold Brown, L. J. Henderson, and Stephen Shulman, 4 July 1966, Miscellaneous Files fromWashington Office Vault Box, RAND Archives; J. R. Goldstein to RAND Corporation Executive Committee, memorandum, 1 July 1966, Miscellaneous Files fromWashington Office Vault Box, RAND Archives; Memorandum by L. J. Henderson, 20 June 1966, Miscellaneous Files fromWashington Office Vault Box, RAND Archives; Memorandum by L. J. Henderson, 17 May 1966, Miscellaneous Files from Washington Office Vault Box, RAND Archives; L. J. Henderson to RAND Corporation Executive Committee, memorandum, 21 July 1966, Miscellaneous Files from Washington Office Vault Box, RAND Archives; Goldstein to Rowen, 31 August 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives; Memorandum by Henry Rowen, 16 August 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives; J. R. Goldstein to Henry Rowen, 31 August 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives; and Complete Minute Books, RAND Board of Trustees' Semi-Annual Meeting Minutes, 1959-Nov 1970, RAND Corporation, Office of the Corporate Secretary.

[840]Memorandum by L. J. Henderson, 27 July 1966, Miscellaneous Files fromWashington Office Vault Box, RAND Archives, p. 4.

[841]Henry Rowen, "Remarks to the RAND Staff," RAND Document D-14986, 15 August 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives, pp. 3-5.

[842]Statement by Henry Rowen to Subcommittee on Economy in Government of the Joint Economic Committee, 21 September 1967, San Bruno NARA Center, Edwin McMillan Papers, Series XV, RAND Corp. Board Papers, 1954-73, Box 1, Folder 8, RG 326, p. 13.

[843]William L. Hooper, Office of Science and Technology, to Ivan Bennett, Deputy Director of the Office of Science and Technology, and Donald F. Hornig, Special Assistant to the President for Science and Technology, memorandum, "Urban Affairs Institute Meeting, Monday, July 10," Office Files of White House Aides, James C. Gaither Papers, Box 384, Folder 1967-68 Task Force on Institute of Urban Development, LBJ Library.

[844]Ibid., 4.

[845]Ibid., 3.

[846]RAND Management Committee Meeting Minutes, 27 July 1958, RAND Archives, p. 2.

[847]J. A. Kershaw and R. N. McKean, "Decision-making in the Schools: An Outsider's View," RAND Paper P-1886, January 1960.

[848]The product of this study was J. A. Kershaw and R. N. McKean, Teacher Shortages and Salary Schedules, RAND Research Memorandum RM-3009-FF (Santa Monica: RAND, February 1962).

[849]This grant produced the following RAND research memoranda and papers: G. A. Hoffman, Automobiles—Today and Tomorrow, RAND Research Memorandum RM-2922-FF (Santa Monica: RAND, November 1962); J. F. Fain, A Multiple Equation Model of Household Locational and Tripmaking Behavior, RAND Research Memorandum RM-3086-FF (Santa Monica: RAND, April 1962); R. H. Haase, Decreasing Travel Time for Freeway Uses, RAND Research Memorandum RM-3099-FF (Santa Monica: RAND, October 1962); G. A. Hoffman, Electric Motor Cars, RAND Research Memorandum RM-3298-FF (Santa Monica: RAND, March 1963); J. H. Niedercorn and E. R. Hearle, Recent Land Use Trends in Forty Eight Large American Cities, RAND Research Memorandum RM-3664-1-FF (Santa Monica: RAND, September 1963); C. J. Zwick, "Models of Urban Change: Their Role in Urban Transportation Research," RAND Paper P-2651, October 1962; C. J. Zwick, "The Demand for Transportation Services in a Growing Economy," RAND Paper P-2682, December

1962; and C. J. Zwick, "Systems Analysis and Urban Planning," RAND Paper P 2754, June 1963.

[850]Gene H. Fisher to Rick Eden, memorandum, "Methodological Developments at RAND," c. 1983, History Drawer, File Cabinet, RAND Archives, p. 1.

[851]Paul Armer; RAND staff member, 1947-68, and consultant, 1968-71.

[852]Paul Armer to Collbohm, memorandum, "Preliminary Report of the Future Work Team," 11 April 1966, Miscellaneous Files From Washington Office Vault Box, RAND Archives, p. 14.

[853]The following discussion of Rowen's plans to re-engineer systems analysis is from his "Proposal for a Research Institute on the Problems of Society," 14 October 1967, Haydon Papers, Box 17, RAND Archives, Appendix 1, pp. 5-10.

[854]Rowen to Robert S. McNamara, Secretary of Defense, 6 April 1967, Donald B. Rice Papers, Air Force 1967-79 Box 1 of 3, RAND Archives, pp. 3-4.

[855]Ellsberg to Rowen, 10 April 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives, pp. 5-6.

[856]Ellsberg also suggested that RAND perform a "systems analysis of systems analysis." He argued that by 1967, enough analyses had been performed that a reasonably productive study could be developed that would explore the sources of success and failure in past studies. Ibid., pp. 4-5.

[857]Clement to Rowen, 4 November 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives.

[858]The $420,000 RSR allotment would also, presumably, have contained some measure of social research. Unfortunately, there is no evidence as to the proportion of RSR funds that was used for social research.

[859]The assignments of these studies were made to the following staff members: crime (Paul Baran), education (Robert Specht), health (Andrew Marshall), program budgeting (Gene Fisher), urban and regional problems (Jim Peterson), and systems analysis training (Bob Lew). Clement to Rowen, 2 September 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives.

[860]Ibid., pp. 1-2.

[861]Clement to Rowen, 7 September 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives.

[862]George H. Clement to Rowen, 28 October 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives, p. 2.

[863]Ibid., p. 3.

[864]Quoted in Paul Armer to J. R. Goldstein, memorandum, "Visit with Henry Rowen on October 13, 1966," 18 October 1966, Henry Rowen Correspondence before Arrival Box, RAND Archives.

[865]George H. Clement to Rowen, 28 October 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives.

[866]Ibid..

[867]Paul Armer reported that per Henry Rowen's conversation with Harold Brown in August 1966, "there are problems in education, health, public order and manpower development and utilization which [Brown] would be happy to have us work on under Project RAND." George H. Clement to Rowen, 28 October 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives.

[868]A twelve page outline of Paul Armer's talk to the board of trustees, entitled "Future RAND Work," can be found in George H. Clement to Rowen, 28 October 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives, p. 9.

[869]Memorandum by Henry Rowen, 3 September 1966, Henry Rowen Correspondence before Arrival Box, RAND Archives, p. 1.

[870]R. Louis Bright, Associate Commissioner for Research, Department of Health, Education and Welfare, Office of Education, to Henry Rowen, 24 January 1967, J. R. Goldstein Papers, Research Council 1967-1968 Box, RAND Archives.

[871]Rowen to Harold Howe II, U. S. Commissioner of Education, Department of Health, Education and Welfare, Office of Education, 2 March 1967, Barbara Woodfill Papers, RAND Archives.

[872]Ibid.

[873]This account of RAND's planned research in transportation systems is largely from George H. Clement to Rowen, 28 October 1966, J. R. Goldstein Papers, Henry Rowen Correspondence before Arrival Box, RAND Archives.

[874]Charles L. Schultze, Director, Bureau of the Budget, to President Johnson, memorandum, "A New Budget Director," 13 September 1967, White House Central Files, Executive series, FG 11-1, Box 53, Folder FG

11-1 7/22/67-9/21/67, LBJ Library.

[875]"Proposal for a Research Institute on the Problems of Society," 14 October 1967, Haydon Papers, Box 17, RAND Archives, p. 8.

[876]Management Committee Meeting Minutes, 25 January 1967, Mary Anderson/Old Research Council/L. B. Rumph Papers, Research Council Minutes and Agendas 1964-67 Folder, RAND Archives.

[877]Ibid.

[878]J. R. Schlesinger to Rowen, memorandum, "Difficulties in and a Mechanism for Partial Restructuring by DoD Program Packages," 30 January 1967, Barbara Woodfill Papers, RAND Archives, p. 1.

[879]Ibid.

[880]RAND press release, 29 March 1967, J. R. Goldstein Papers, Correspondence/Augenstein/Aero-Astronautics/Etc. Box, RAND Archives.

[881]Bruno W. Augenstein to Rowen, memorandum, 27 March 1967, J. R. Goldstein Papers, Correspondence/Augenstein/Aero-Astronautics/etc. Box, RAND Archives, p. 3.

[882]Ibid., pp. 11-12.

[883]Following these organizational changes, the Management Committee consisted of the president, vice presidents, deputy to the senior vice president, and the heads of the departments.

[884]Rowen to Department Heads, memorandum, "RAND Research and Study Area Program," 19 April 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives, p. 7.

[885]Rowen to Robert S. McNamara, Secretary of Defense, 6 April 1967, Donald B. Rice Papers, Air Force 1967-79 Box 1 of 3, RAND Archives, p. 5.

[886]Bruno W. Augenstein to Rowen, memorandum, 27 March 1967, J. R. Goldstein Papers, Correspondence/Augenstein/Aero-Astronautics/etc. Box, RAND Archives, p. 5.

[887]Robert D. Specht to Rowen, memorandum, "The Program for Strengthening RAND," 26 April 1967, Mary Anderson/Old Research Council/L. B. Rumph Papers, Miscellaneous 1959-1970 Folder, RAND Archives, p. 10.

[888]"Proposal for a Research Institute on the Problems of Society," 14 October 1967, Haydon Papers, Box 17, RAND Archives, p. 1.

[889]Ibid., p. 6.

[890]Ibid., p. 2.

[891]Rowen to Robert S. McNamara, Secretary of Defense, 6 April 1967, Donald B. Rice Papers, Air Force 1967-79 Box 1 of 3, RAND Archives, p. 6.

[892]Henry Rowen, "Proposal for a Research and Training Institute on Societal Problems," 18 March 1967, Adam Yarmolinsky Papers, Box 129, Folder RAND Corp.—Meetings, 1967-69, John F. Kennedy Library, p. 6.

[893]Lyndon B. Johnson, Special Message to the Congress on America's Unfinished Business: Urban and Rural Poverty, 14 March 1967, Public Papers of the Presidents of the United States, Lyndon Johnson, 1967, Book I (Washington, D.C.: Government Printing Office, 1968), pp. 331-346.

[894]Robert C. Weaver (1907-); professor, Columbia Teachers College, 1947; professor New York University, 1947-49; director of opportunity fellowships, J. H. Whitney Foundation, 1949-54; deputy commissioner, New York State Division of Housing, 1954-55; rent administrator, New York State, 1955-59; consultant, Ford Foundation, 1959-60; vice chairman, Housing and Redevelopment Board of New York City, 1960-61; administrator, Housing and Home Finance Administration, 1961-66; secretary of Housing and Urban Development, 1966-68; president Baruch College, 1969-70; professor, Hunter College, 1970-. For biographical information, see Journal of Housing 43 (November/December 1986), 268.

[895]Robert C. Weaver, Secretary of Housing and Urban Development to Joseph A. Califano, Jr., Special Assistant to the President, memorandum, 5 July 1967 Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library, Attachment, p. 1.

[896]Donald F. Hornig, Special Assistant to the President for Science and Technology, to Robert C. Wood, Under Secretary of Housing and Urban Development, memorandum, "Rand Summer Program in Transportation," 25 May 1967, Donald F. Hornig Papers, Box 5, Folder Donald Hornig Chronological File: April-June, 1967, LBJ Library, Attachment, p. 1.

[897]Ibid., various pages.

[898]T. F. Rogers, Director of the Office of Urban Technology and Research, to Robert C. Wood, Under Secretary of Housing and Urban Development, memorandum, 13 July 1967, NARA, RG 207, entry 55-Subject, Correspondence 1942-1969, Robert Weaver Papers, Box 270, Folder Urban Technology and Research, Memorandums 1967, p. 1.

[899]The conference attendees were Kenneth Arrow, Department of Economics, Stanford University; William M. Capron, Brookings Institution; James S. Coleman, Johns Hopkins University; William L. Hooper, Office of Science and Technology; Fred C. Ikle, Massachusetts Institute of Technology; Seymour M. Lipset, Center for International Affairs, Harvard University; Albert Madansky, Market Planning Corporation; John R. Meyer, Economics Department, Harvard University; Malcolm Moos, Ford Foundation; Richard E. Neustadt, Department of Government, Harvard University; Herbert L. Packer, Stanford University; Marshall A. Robinson, Division of Education and Research, Ford Foundation; Thomas F. Rogers, Department of Housing and Urban Development; Chauncey Starr, College of Engineering, University of California at Los Angeles; Philip J. Stone, Department of Social Relations, Harvard University; Albert J. Wohlstetter, Political Science Department, University of Chicago; Adam Yarmolinsky, Law School, Harvard University; and Charles J. Zwick, Bureau of the Budget. Attending from RAND were Bruno W. Augenstein, Herbert Goldhamer, J. Richard Goldstein, Roger Levien, Henry S. Rowen, Robert D. Specht, Marvin Stern, Olaf Helmer, Paul Armer, and Paul Baran. DOC 1018.

[900]William L. Hooper to Donald F. Hornig, Special Assistant to the President for Science and Technology, memorandum, "Discussion of Rand-related Urban Institute," 17 May 1967, Office Files of White House Aides, James C. Gaither Papers, Box 384, Folder 1967-68 Task Force on Institute of Urban Development, LBJ Library, p. 1.

[901]Ibid., 3.

[902]Jim Gaither to Joseph A. Califano, Special Assistant to the President, and Larry Levinson, memorandum, "Urban Institute," 18 May 1967, Office Files of White House Aides, James C. Gaither Papers, Box 384, Folder Institute for Urban Development, LBJ Library, p. 1.

[903]Ibid.

[904]Robert C. Wood (1923-); management organization expert, U.S. Bureau of the Budget, 1951-54; lecturer and assistant professor, Harvard University, 1954-57; professor, Massachusetts Institute of Technology, 1957-66, 1969-70; Under Secretary of Housing and Urban Development, 1966-68; Secretary of HUD, 1969; director, Harvard-M.I.T. Joint Center for Urban Studies, 1969-70; president, University of Massachusetts, 1970-77; superintendent, Boston Public Schools, 1978-80; professor, University of Massachusetts, 1981-83; professor, Wesleyan University, 1983-. For biographical information, see Who's Who in America, 49th ed., 1995 (Chicago: Marquis Who's Who, 1995).

[905]It is notable that in addition to Gaither's familial association with RAND, three of the remaining seven participants of this meeting—Zwick, Gorham, and Hoffman—were RAND alumni.

[906]William Gorham, Assistant Secretary of HEW for Program Coordination, to Joseph A. Califano, Jr., Special Assistant to the President, memorandum, 13 July 1967, Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library, p. 1.

[907]Robert C. Weaver, Secretary of Housing and Urban Development to Joseph A. Califano, Jr., Special Assistant to the President, memorandum, 5 July 1967 Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library, Attachment, p. 3.

[908]Frederick Bohen, Acting Staff Secretary for the Incorporating Committee for the Institute on Urban Affairs, to Joseph Califano, memorandum, 8 March 1968, Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library, p. 1.

[909]Memorandum by Robert C. Wood, Under Secretary of Housing and Urban Development, "A National Program for Urban Research," no date but probably January 1967, NARA, RG 207, ent 55-Subj, Corresp 1942-1969, Office of Assistant Secretary for Administration Papers, Box 450, Folder Central Office, Office of Urban Technology and Research, #1, Jan 67, pp. 8-9.

[910]Robert C. Wood, Under Secretary of Housing and Urban Development, to Robert C. Weaver, Secretary of Housing and Urban Development, memorandum, 24 July 1967, NARA, RG 207, entry 55--Subject, Correspondence 1942-1969, Robert Weaver Papers, Box 291, Folder White House Staff, May-June-July-August 1967.

[911]Frederick Bohen, Acting Staff Secretary for the Incorporating Committee for the Institute on Urban Affairs, to Joseph Califano, memorandum, 8 March 1968, Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library, p. 2.

[912]The task force members were Robert Wood, Under Secretary of HUD (Chairman); James S. Dussenberry, Member, Council of Economic Advisors; William Gorham, Assistant Secretary, Department of Health, Education and Welfare; Charles Zwick, Assistant Director, Bureau of the Budget; Thomas Rogers, Office of Urban Technology, Department of Housing and Urban Development; and Fred Bohen, Assistant to Joseph

Califano.

[913]Califano to James S. Dussenberry, member, Council of Economic Advisors, William Gorham, Assistant Secretary of HEW; Charles Zwick, Assistant Director, BOB; Thomas Rogers, Office of Urban Technology, Department of Housing and Urban Development, 28 July 1967, Office Files of White House Aides, James C. Gaither Papers, Box 192, Folder 1967-68 Task Force on Institute of Urban Development, LBJ Library, p. 1.

[914]Robert C. Wood, Under Secretary of Housing and Urban Development to Joseph A. Califano, Jr., Special Assistant to the President, memorandum, 11 October 1967, Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library, p. 5.

[915]Ibid.

[916]Ibid.

[917]In its final form, the Urban Institute was much less closely controlled by HUD as Robert Weaver and Robert Wood had intended. As is discussed below, during early 1968 the Urban Institute's incorporating committee took strong exception to the task force provisions that HUD oversee the institute's day-to-day management, and the panel dramatically eroded HUD's control.

[918]Califano to President Johnson, memorandum, 21 November 1967, White House Central Files, FG 815, Executive Series, Box 427, folder "Institute for Urban Development," LBJ Library, p. 2.

[919]Ibid.

[920]Ibid., p. 3.

[921]Memorandum by J. R. Goldstein, 12 December 1967, San Bruno NARA Center, Edwin McMillan Papers, Series XV, RAND Corp. Board Papers, 1954-73, Box 1, Folder 7, RG 326, p. 7.

[922]The members of the panel were J. Irwin Miller, Chairman of the Board of Cummins Engine (chairman); Robert S. McNamara, Secretary of Defense; Arjay Miller, President of Ford Motor Company; McGeorge Bundy, President of the Ford Foundation; Kermit Gordon, President of the Brookings Institution; Richard Neustadt, Director of the Kennedy Institute of Politics, Harvard University; and Cyrus Vance, a New York City attorney. Representing the government were Secretary of Housing and Urban Development Robert Weaver, Under Secretary of HUD Robert Wood, and Joseph Califano's assistant, Frederick Bohen (Acting Secretary of the incorporating panel).

[923]The following account of this meeting is from Memorandum by Henry Rowen, 21 July 1967, Donald B. Rice Papers, Air Force 1967-79 Box 1 of 3, RAND Archives.

[924]Ibid., p. 1.

[925]Frederick Bohen, Acting Staff Secretary for the Incorporating Committee for the Institute on Urban Affairs, to Joseph Califano, memorandum, 8 March 1968, Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library, p. 1.

[926]Frederick M. Bohen, minutes of initial meeting of the Incorporating Committee of the Institute for Urban Devevelopment, 22 December 1967, Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library, p. 7.

[927]McGeorge Bundy (1919-); political analyst, Council on Foreign Relations, 1948-49; professor, Harvard University, 1949-61; special assistant to the president for national security affairs, 1961-66; president, Ford Foundation, 1966-79; professor, New York University, 1979-. For biographical information, see Benjamin A. Frankel ed., The Cold War, 1945-1991, vol. 1 (Detroit: Gale Research Co., 1992); Who's Who in America, 49th ed., 1995 (Chicago: Marquis Who's Who, 1995); and The Encyclopedia of World Biography: 20th Century Supplement (New York: Heraty and Associates, 1987), 225-226.

[928]Frederick M. Bohen, minutes of initial meeting of the Incorporating Committee of the Institute for Urban Devevelopment, 22 December 1967, Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library, p. 7.

[929]Ibid.

[930]Frederick Bohen, Acting Staff Secretary for the Incorporating Committee for the Institute on Urban Affairs, to Joseph Califano, memorandum, 22 December 1967, Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library, p. 1.

[931]William Gorham, President, The Urban Institute, to board of trustees, 25 June 1968, White House Central Files, FG 815, Executive Series, Box 427, Folder FG 815 6/25/68 -, LBJ Library, pp. 2-3.

[932]Frederick Bohen, Acting Staff Secretary for the Incorporating Committee for the Institute on Urban Affairs, to Joseph Califano, memorandum, 22 December 1967, Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library, p. 2.

[933]Memorandum by Califano, 3 January 1968, Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library. This memorandum was sent to Alexander B. Trowbridge, Secretary of Commerce; Alan S. Boyd, Secretary of Transporation; Sargent Shriver, Director of the Office of Economic Opportunity; John W. Gardner, Secretary of Health, Education, and Welfare; W. Willard Wirtz, Secretary of Labor; and Ramsey Clark, Attorney General.

[934]Memorandum by Califano, 26 January 1968, Office Files of White House Aides, James C. Gaither Papers, Box 49, Folder The Urban Institute, LBJ Library.

[935]Califano to President Johnson memorandum, 26 April 1968, Office Files of White House Aides, James C. Gaither papers, Box 50, Folder The Urban Institute, #2, LBJ Library.

[936]These letters were identical except for their addressees. A sample letter is Califano to Nelson A. Rockefeller, Governor of New York, 26 April 1968, White House Central Files, FG 815, Executive Series, Box 427, Folder FG 815 - Institute for Urban Development, LBJ Library.

[937]"Proposal for a Research Institute on the Problems of Society," 14 October 1967, Haydon Papers, Box 17, RAND Archives, p. 9.

[938]Ibid., Appendix 3, pp. 2-3.

[939]Memorandum by Fred C. Ikle, "On the Needs and Prospects for Private Endowment for RAND," 13 March 1968, Gustave H. Shubert Papers, Fundraising/Development/Lawsuits/Admin Box, RAND Archives, p. 1.

[940]Membership Lists of Development Steering Committee, Development Consultants, Board Special Committee on Devevelopment, and RAND University Board, no date, Gustave H. Shubert Papers, DPD files 1967-71, Box 2, Development Program-History Folder, RAND Archives.

[941]See L. J. Henderson to Rowen, memorandum, "New York Meeting of Trustees' Committee and Endowment-Type Financing for RAND's Domestic Research," 20 March 1968, Gustave H. Shubert Papers, Fundraising/Development/Lawsuits/Admin Box, RAND Archives.

[942]Henry Rowen, draft of presentation to board of trustees, 23 February 1968, Gustave H. Shubert Papers, Fundraising/Development/NYC-RAND Institute Box, RAND Archives, p. 10.

[943]Memorandum by Henry Rowen, 21 July 1967, Donald B. Rice Papers, Air Force 1967-79 Box 1 of 3, RAND Archives, p. 1.

[944]Bohen to Califano, Wood, Schultze, Zwick, memorandum, 9 November 1967, Office Files of White House Aides, James C. Gaither Papers, Box 192, Folder 1967-68 Task Force on Institute of Urban Development, LBJ Library, p. 1.

[945]Ibid.

[946]Fred C. Ikle to J. R. Goldstein, memorandum, "Possible Standard Oil (NJ) Funding for RAND," 19 April 1968, Gustave H. Shubert Papers, Fundraising/Development/Lawsuits/Admin Box, RAND Archives.

[947]RAND's remarkably prolific Middle East research program resulted in the following publications: Abraham S. Becker, Bert Hansen and Malcolm H. Kerr, "The Economics and Politics of the Middle East," in Charles A. Cooper and Sidney S. Alexander, eds., The Middle East: Economic and Political Problems and Prospects (New York: American Elsevier, 1972) (hereafter referred to as The Middle East); Marion Clawson, Hans H. Landsburg, and Lyle T. Alexander, "The Agricultural Potential of the Middle East," in The Middle East; Charles A. Cooper and Sidney S. Alexander, "Economic Development and Population Growth in the Middle East," in The Middle East; Paul Y. Hammond and Sidney S. Alexander, "Political dynamics in the Middle East," in The Middle East; Sam H. Schurr, Paul T. Horman et al., "Middle Eastern Oil and the Western World: Prospects and Problems," in The Middle East; A. S. Becker, A. L. Horelick, Soviet Policy in the Middle East, RAND Report R-504-FF (Santa Monica: RAND, September 1970); Y. Ben-Porath and E. Marx, Some Sociological and Economic Aspects of Refugee Camps on the West Bank, RAND Report R-835-FF (Santa Monica: RAND, August 1971); H. Ben-Shahar, E. Berglas, Y. Mundlak, and E. Sadan, Economic Structure and Development Prospects of the West Bank and the Gaza Strip, RAND Report R-839-FF (Santa Monica: RAND, September 1971); B. Hansen, Economic Development in Egypt, RAND Research Memorandum RM-5961-FF (Santa Monica: RAND, October 1969; C. F. Gallagher, The Maghrib and the Middle East, RAND Research Memorandum RM-5962-FF (Santa Monica: RAND, July 1969; B. Hansen, Economic Development in Syria, RAND Research Memorandum RM-5964-FF (Santa Monica: RAND, December 1969; M. H. Kerr, Regional Arab Politics and the Conflict with Israel, RAND Research Memorandum RM-5966-FF (Santa Monica: RAND, July 1969; M. H. Kerr, The United Arab Republic: The Domestic Political and Economic Background of Foreign Policy, RAND Research Memorandum RM-5967-FF (Santa Monica: RAND, August 1969; L. Binder, Factors Influencing Iran's International Role, RAND Research Memorandum RM-5968-FF (Santa Monica: RAND, July 1969; W. E. Hoehn, Jr., Prospects for Desalted Water Costs, RAND Research Memorandum RM-5971-FF

(Santa Monica: RAND, August 1969; D. Peretz, The Palestine Arab Refugee Problem, RAND Research Memorandum RM-5973-FF (Santa Monica: RAND, July 1969; M. Bruno, Economic Development Problems of Israel, 1970 1980, RAND Research Memorandum RM-5975-FF (Santa Monica: RAND, March 1970; T. P. Schultz, Fertility Patterns and Their Determinants in the Arab Middle East, RAND Research Memorandum RM-5978-FF (Santa Monica: RAND, May 1970; A. Daher, Current Trends in Arab Intellectual Thought, RAND Research Memorandum RM-5979-FF (Santa Monica: RAND, December 1969; W. Quandt, United States Policy in the Middle East: Constraints and Choices, RAND Research Memorandum RM-5980-FF (Santa Monica: RAND, January 1970; Y. Ben-Porath, Fertility in Israel, An Economist's Interpretation: Differentials and Trends, 1950 1970, RAND Research Memorandum RM-5981-FF (Santa Monica: RAND, August 1970; R. E. Huschke, R. R. Rapp, and C. Schutz, Meteorological Aspects of Middle East Water Supply, RAND Research Memorandum RM-6267-FF (Santa Monica: RAND, March 1970; and J. C. Hurewitz, Changing Military Perspectives in the Middle East, RAND Research Memorandum RM-6355-FF (Santa Monica: RAND, August 1970).

[948]Rowen to McGeorge Bundy, President of the Ford Foundation, 20 June 1968, Gustave H. Shubert Papers, DPD files 1967-71, Box 2, Development Program-History Folder, RAND Archives, p. 7.

[949]Memorandum by Don Kummerfeld, Acting Executive Secretary of Urban Institute, "Meeting with the Ford Foundation," 15 April 1968, Office Files of White House Aides, James C. Gaither Papers, Box 50, Folder The Urban Institute, #2, LBJ Library, p. 1.

[950]J. R. Goldstein to RAND Corporation Finance and Executive Committees, 13 September 1967, Miscellaneous Files from Washington Office Vault Box, RAND Archives, pp. 1-2.

[951]This body of criticism is dominated by the work of Charles E. Lindblom and Aaron Wildavsky. See Charles E. Lindblom, "The Science of 'Muddling Through,'" Public Administration Review 19, No. 2 (Spring 1959): 79-88; "Decision-Making in Taxation and Expenditures," in National Bureau of Economic Research, Public Finances: Needs, Sources, and Utilization (Princeton University Press for NBER, 1961); David Braybrooke and Charles Lindblom, A Strategy of Decision: Policy Evaluation as a Social Process (Macmillan, 1963); Charles Lindblom, The Intelligence of Democracy (Macmillan, 1965); and Aaron Wildavsky, "The Political Economy of Efficiency: Cost-Benefit Analysis, Systems Analysis, and Program Budgeting," Public Administration Review 26, No. 4 (December 1966): 292-310.

[952]Hoos, Systems Analysis in Public Policy, 248-249.

[953]Robert S. McNamara, In Retrospect: The Tragedy and Lessons of Vietnam (New York: Random House, 1995).

[954]Henry S. Rowen, memorandum of conversation with Harold Brown, 16 August 1966, J. R. Goldstein Papers, Henry Rowen Correspondence Before Arrival Box, RAND Archives.

[955]Robert H. Haveman, Poverty Policy and Poverty Research: The Great Society and the Social Sciences (Madison: University of Wisconsin Press, 1987), 32.

[956]Ibid., 31, Table 3.1.

[957]Ibid., 166.

[958]Charles J. Zwick, interview by David McComb, 1 August 1969, Miami, FL, Lyndon B. Johnson Library Oral History Collection, 21.

[959]Robert Wood, "The Great Society in 1984: Relic or Reality?," in The Great Society and its Legacy, Marshall Kaplan and Peggy L. Cuciti, eds. (Durham: Duke University Press, 1986), 21-22.

[960]Hoos, Systems Analysis in Public Policy, 96.

Chapter 12

[961]Letter, Henry S. Rowen to McGeorge Bundy, 20 June 1968, Gustave H. Shubert Papers, DPD files 1967-71, Box 2, Dev Prgm-History Folder, p. 6.

[962]The following examples are from Peter L. Szanton, "Analysis and Urban Government: Experience of the New York City-RAND Institute," RAND Paper P-4822, April 1972, RAND Corporation, p. 3.

[963]Charles R. Morris, The Cost of Good Intentions: New York City and the Liberal Experiment, 1960-1975 (New York: McGraw-Hill, 1980), p. 28.

[964]Quoted in Scot MacDonald, untitled article, Government Executive, June 1969, copy in Gustave Shubert Papers, Box 77-B-2, New York City-RAND Institute 1969 Folder, RAND Archives, p. 41.

[965]Morris, pp. 46-47.

[966]Peter L. Szanton, "Analysis and Urban Government: Experience of the New York City-RAND Institute," RAND Paper P-4822, April 1972, RAND Corporation, p. 1; and Mitchell Sviridoff, Vice President, Division of National Affairs, Ford Foundation, to Henry Rowen, 5 November 1971, Gustave H. Shubert Papers, Fundraising/Development/NYC-RAND Institute Box, RAND Archives.

[967]Morris, p. 95.

[968]Ford Foundation's evaluation of the New York City-RAND Institute, 5 November 1971, Gustave Shubert Papers, Box 77-1-B, Ford Foundation Evaluation of New York City-RAND Folder, RAND Archives, p. 5. Hereafter referred to as Ford Foundation Evaluation.

[969]Ibid., pp. 5-6.

[970]Ibid., pp. 22-23.

[971]Memorandum by Edwin E. Huddleson, Jr., "Origin of the New York City-RAND Institute," 30 May 1975, Gustave H. Shubert Papers, Box 77-B-2, NYC-RI History Folder, RAND Archives, p. 3.

[972]Ford Foundation Evaluation, p. 24.

[973]An example is Clifton C. Carter's (Johnson's liaison with the Democratic National Committee) memo to President Johnson regarding the Lindsay-Beame election in 1965. Carter wrote, "Should [incumbent mayor Robert F.] Wagner withdraw [from the race], I would hope that Abe Beane (sic) would be the candidate as he is very popular, a good Johnson man, and the strongest anti-Bobby Kennedy man of the lot. This, in my opinion, would be the main bulwark to prevent turning the state over to Bobby, as the mayor of the city always exerts so much influence over the state and county committees." Memorandum, Clifton C. Carter, Johnson's liaison with the Democratic National Committee, to President Johnson, 3 June 1965, Subj: New York Mayor's Race, 3 June 1965, White House Central Files, LG/New York City, Executive Series, Box 10, Folder "LG/New York City," LBJ Library, p. 1.

[974]Letter, John V. Lindsay, Mayor of New York, to Robert Wood, Under Secretary of Housing and Urban Development, 9 May 1967, NARA, RG 207, entry 55--Subject, Correspondence 1942-1969, Robert Weaver Papers, box 269, Folder "Under Secretary Correspondence, 1967."

[975]Letter, John V. Lindsay, Mayor of New York, to Robert Wood, Under Secretary of Housing and Urban Development, 9 May 1967, NARA, RG 207, entry 55--Subject, Correspondence 1942-1969, Robert Weaver Papers, box 269, Folder "Under Secretary Correspondence, 1967."

[976]Concerning Johnson's suspicion that Lindsay was the source of the committee leaks, see David Ginsberg to President Johnson, memorandum, "News Leaks—Commission on Civil Disorders," 7 October 1967, White House Central Files, LG/New York City, Executive Series, Box 10, Folder LG/New York City, LBJ Library. With regard to Johnson's efforts to delay federal housing grants to New York City, on 31 October 1967, Califano wrote to President Johnson: "I told [Secretary of Housing and Urban Development Robert] Weaver that all of his [housing] grants for New York City should be cleared over here before they were made. Weaver said he could not run his Department that way and said that we would have to live with Lindsay getting credit for many of these projects because of the way HUD operated. . . . Aside from the policy question, I do not believe that he is technically correct. For example, it seems to me there is no reason why—so long as HUD personnel have to do anything about the Lindsay [housing] projects—their action cannot be delayed or postponed." Califano to President Johnson, memorandum, 31 October 1967, White House Central Files, LG/New York City, Executive Series, Box 10, Folder LG/New York City, LBJ Library.

[977]Letter, George H. Clement to Henry Rowen, 28 October 1966, J. R. Goldstein papers, Henry Rowen Correspondence before Arrival Box, RAND Archives, p. 1.

[978]RAND Corporation Management Committee Meeting Minutes, 25 January 1967, Mary Anderson/Old Research Council/L.B. Rumph Papers, Research Council Minutes and Agendas 1964-67 Folder, RAND Archives, p. 1.

[979]Frederick O'R. Hayes, draft of essay on New York City-RAND Institute history, 7 August 1973, Gustave Shubert Papers, Box 77-B-1, Correspondence-General Folder, RAND Archives, p. 15.

[980]President's Commission on Law Enforcement and Administration of Justice, The Challenge of Crime in a Free Society (Washington, D.C.: U.S. Government Printing Office, 1967).

[981]Report to RAND Board of Trustees, "Status Report and Questions Concerning the Future of RAND Domestic Research Efforts,"29 February 1968, Brownlee Haydon Papers, Box 17, RAND Archives, pp. 5-6.

[982]Ibid., p. 9.

[983]Ford Foundation Evaluation, p. 11.

[984]This account of RAND's research efforts in New York City is from the Ford Foundation's evaluation of the New York City-RAND Institute, 5 November 1971, Gustave Shubert Papers, Box 77-1-B, Ford Foundation

Evaluation of New York City-RAND Folder, RAND Archives. Hereafter referred to as Ford Foundation Evaluation.

[985]Ford Foundation Evaluation, 12-13.

[986]Memorandum, Edward W. Paxson to S. Genensky, "The New York Project," 4 January 1968, Brownlee Haydon Papers, Box 8.

[987]Ibid., pp. 1-2.

[988]Ford Foundation Evaluation, p. 31.

[989]See, for example, Frederick O'R. Hayes, draft of essay on New York City-RAND Institute history, 7 August 1973, Gustave Shubert Papers, Box 77-B-1, Correspondence-General Folder, RAND Archives, p. 19.

[990]Ibid., p. 16.

[991]For example, see "How About Lindsay," Nation 206 (April 22, 1968): 524-5; L. L. King, "Lindsay of New York, Harpers 237 (August 1968): 37-44; and M. Renek, "How Lindsay Did It," New Republic 158 (March 2, 1968): 33-4.

[992]Morris, p. 120.

[993]Memorandum, Peter Goldmark to Peter Szanton, RAND, "Assorted Miscellanea," 4 June 1968, in memorandum, Edwin E. Huddleson, Jr., to file, "Origin of the New York City- RAND Institute," 30 May 1975, Gustave H. Shubert Papers, Box 77-B-2, NYC-RI History Folder, RAND Archives.

[994]Ibid.

[995]Ibid.

[996]Memorandum, Peter Goldmark to Frederick O'R. Hayes, "Institute for Urban Program Analysis," 9 September 1968, p. 2. In memorandum, Edwin E. Huddleson, Jr., to file, "Origin of the New York City- RAND Institute," 30 May 1975, Gustave H. Shubert Papers, Box 77-B-2, NYC-RI History Folder, RAND Archives.

[997]Ibid.

[998]Ford Foundation Evaluation, p. 137. This evaluation reports, "The New York City-Rand Institute was an experimental project, stemming from a 1967 Foundation decision to see 'whether 'systems processes' can be as successfully applied to the problems of cities' as they had been to space and defense programs. A specific provision of the grant to the institute was to help support 'studies where other cities could clearly gain from the output.'"

[999]Letter, Henry S. Rowen to McGeorge Bundy, 20 June 1968, Gustave H. Shubert Papers, DPD files 1967-71, Box 2, Dev Prgm-History Folder.

[1000]Memorandum, Peter Goldmark to Dave Grossman, John Forrer, Dinni Gordon, 19 September 1968, p. 1. In memorandum, Edwin E. Huddleson, Jr., to file, "Origin of the New York City- RAND Institute," 30 May 1975, Gustave H. Shubert Papers, Box 77-B-2, NYC-RI History Folder, RAND Archives.

[1001]Despite the substantial support provided by the Ford Foundation to NYCRI, Ford's support of the institute remained highly uncertain and frequently problematic. By early 1971, the Ford Foundation had committed $1.24 million to support NYCRI's program of research and policy analysis in New York City, but top Ford officials remained less than enthusiastic about the institute and its work. First, Louis Winnick, the program director responsible for Ford's relationship with NYCRI, had been opposed to Lindsay's concept of an independent policy institute since 1966. While he had finally lent support to the mayor's partnership with RAND, the institute's failure to escape its perception as an arm of the Lindsay administration dampened Winnick's enthusiasm for the project. Second, Mitchell Sviridoff, the vice president of Ford's National Affairs Division, was suspicious of RAND's intensively mathematical policy analysis techniques. Sviridoff had long experience in urban and social welfare policymaking, but he stressed the importance of humanistic policy elements that were not amenable to easy or accurate quantification. RAND's "scientific" policy methods, especially its concentration on mathematical modeling and optimization, were simply not Sviridoff's cup of tea. Finally, both Sviridoff and Winnick were anxious not to tread on foundation president McGeorge Bundy's commitment to the Urban Institute. As discussed above, Bundy had been the chairman of the Urban Institute's organizing panel and thus was not favorably disposed towards nurturing that organization's foremost competitor, NYCRI.

[1002]Memorandum, Frederick O'R. Hayes to Mayor John Lindsay, 25 November 1968, p. 1. In memorandum, Edwin E. Huddleson, Jr., to file, "Origin of the New York City- RAND Institute," 30 May 1975, Gustave H. Shubert Papers, Box 77-B-2, NYC-RI History Folder, RAND Archives.

[1003]Ibid., p. 3.

[1004]The initial board of trustees for NYCRI comprised (chairman) Bernard Botein, retired Presiding Justice of the Appellate Division of the N. Y. Supreme Court, First Department; Timothy Costello, Deputy Mayor and City Administrator; Henry Foner, President, Joint Board, Fur, Leather and Machine Workers Union; T. Keith

Glennan, Assistant to the President of The Urban Coalition; William T. Golden, Corporate Director and Trustee and Chairman of the City University Construction Fund; Frederick O'R. Hayes, Director of the Budget, City of New York; Edwin E. Huddleson, Jr., Attorney and RAND Trustee; Theodore W. Kheel, Attorney and Labor Mediator; Gustave Levy, Senior Partner, Goldman Sachs & Co.; Henry S. Rowen, President, RAND; David A. Shepard, Chairman of the Board of Trustees, RAND; Frank Stanton, President, Columbia Broadcasting System, Inc. and RAND trustee; Lewis Thomas, M.D., Dean, New York University Medical School; and, Franklin H. Williams, Director, Urban Center, Columbia University.

[1005]Letter, Howard R. Dressner, Secretary of the Ford Foundation, to Henry Rowen, 2 July 1969, Gustave Shubert Papers, Calendars, Memos and Correspondence 1969-71 Box, RAND Archives, p. 1.

[1006]Memorandum, "Operating Relationship Between RAND-Santa Monica and the New York City-RAND Institute," 5 December 1969, New York City-RAND Institute Papers, Box 23316, 1 of 3, RAND-Institute Understandings Folder, RAND Archives, pp. 1-2.

[1007]For a survey of RAND's and NYCRI's program of research, including bibliographical references to research publications, see The New York City RAND Institute Final Report, 1969-1976 (Santa Monica, CA: The RAND Corporation, 1977), RAND Archives. Hereafter referred to as NYCRI Final Report.

[1008]Memorandum, Peter Szanton to Henry Rowen, 4 April 1968, J. R. Goldstein papers, New York City-RAND Institute Box, RAND Archives, p. 2.

[1009]Demographic data on RAND's New York City staff is from Ford Foundation Evaluation.

[1010]Ibid., 84.

[1011]For a detailed review of NYCRI's fire research in New York City, see Warren E. Walker, Jan M. Chaiken, and Edward J. Ignall, eds., Fire Department Deployment Analysis: A Public Policy Analysis Case Study. The RAND Fire Project (New York: North Holland, 1979.

[1012]NYCRI Final Report, 12.

[1013]Patrick V. Murphy and Thomas Plate, Commissioner: A View from the Top of American Law Enforcement (New York: Simon and Schuster, 1977), p. 143.

[1014]Ibid.

[1015]Ford Foundation Evaluation, 99.

[1016]Memorandum, Joel Edelman to Jan Chaiken, "Ideas for New Studies of NYC Police," 6 October 1970, Shubert Papers, Box 77-B-2, New York City-RAND Institute 1970 Folder, RAND Archives, p. 2.

[1017]Frederick O'R. Hayes, draft of essay on New York City-RAND Institute history, 7 August 1973, Gustave Shubert Papers, Box 77-B-1, Correspondence-General Folder, RAND Archives, p. 22-23.

[1018]B. Cohen, "The Police Internal Administration of Justice in New York City," RAND Report R-621-NYC (Santa Monica, CA: The RAND Corporation, 1970).

[1019]Ford Foundation Evaluation, 100.

[1020]For the results of this study, see S.J. Press, "Some Effects of an Increase in Police Manpower in the 20th Precinct of New York City," RAND Report R-704-NYC (Santa Monica, CA: The RAND Corporation, 1971).

[1021]NYCRI Final Report, 26.

[1022]Ford Foundation Evaluation, 47. For the results of NYCRI's housing research, see J.S. Desalvo, "An Economic Analysis of New York's Mitchell-Lama Housing Program," RAND Report R-610-NYC (Santa Monica, CA: The RAND Corporation, 1971); C.P. Rydell, "Factors Affecting Maintenance and Operating Costs in Federal Public Housing Projects," RAND Report R-634-NYC (Santa Monica, CA: The RAND Corporation, 1970); M.B. Teitz and S. Rosenthal, "Housing Code Enforcement in New York City," RAND Report R-648-NYC (Santa Monica, CA: The RAND Corporation, 1971); I.S. Lowry, J.S. DeSalvo, and B. Woodfill, "Rental Housing in New York City, Volume II: The Demand for Shelter," RAND Report R-649-NYC (Santa Monica, CA: The RAND Corporation, 1971); B. Woodfill, "New York City's Mitchell-Lama Program: Middle-Income Housing?," RAND Report R-786-NYC (Santa Monica, CA: The RAND Corporation, 1971); and, K.M. Eisenstadt, "Factors Affecting Maintenance and Operating Costs in Private Rental Housing," RAND Report R-1055-NYC (Santa Monica, CA: The RAND Corporation, 1972).

[1023]Ibid.

[1024]See, for example, D.H. Greenberg, "The Potential Impact of the Family Assistance Plan on New York City," RAND Report R-658-NYC (Santa Monica, CA: The RAND Corporation, 1971); C.P. Rydell, "Two Counts of Welfare in New York City: A Comparison of City and Census Data for 1969," RAND Report R-1179-NYC (Santa Monica, CA: The RAND Corporation, 1972); D.M. de Ferranti, S. Leeds, J.A. Grundfest, V. Leach, P.A. Parker, and L.L. Prusoff, "The Welfare and Nonwelfare Poor in New York City," RAND Report R-

1381-NYC (Santa Monica, CA: The RAND Corporation, 1974); and C.P. Rydell, T. Palmerio, G. Blais, and D. Brown, "Welfare Caseload Dynamics in New York City," RAND Report R-1441-NYC (Santa Monica, CA: The RAND Corporation, 1974).

[1025]Memorandum, Peter Szanton to Henry Rowen, 4 April 1968, J. R. Goldstein papers, New York City-RAND Institute Box, RAND Archives, p. 2; and letter, David A. Shepard to Dr. Arnold O. Beckman, Chairman of the Board, System Development Corporation, 2 October 1968, Donald B. Rice Papers, Box 2 of 3, H. S. Rowen Materials Folder, RAND Archives, p. 4.

[1026]Letter, T. Keith Glennan, RAND trustee, to Henry Rowen, 22 March 1968, Gustave Shubert Papers, Fundraising/Development/Lawsuits/Admin Box, RANDArchives, p. 2. Also, David A. Shepard, Chairman of RAND's Board of Trustees, wrote to Dr. Arnold O. Beckman, Chairman of Board of System Development Corporation, "Rand has been approached by representatives of several cities with the request that we undertake programs for them similar to the one in New York City. Our program in New York could be a model for many other cities. But despite, the need, we have not yet tried to meet it. One reason is that we have few people able to direct undertakings of this sort, although we are training a cadre in New York." Letter, David A. Shepard to Dr. Arnold O. Beckman, Chairman of the Board, System Development Corporation, 2 October 1968, Donald B. Rice Papers, Box 2 of 3, H. S. Rowen Materials Folder, RAND Archives, p. 4.

[1027]Ford Foundation Evaluation, p. 17.

[1028]Edward Renzal, "Garelik Calls Rand Study of City's Police a Failure," New York Times, 7 October 1970, p. 55.

[1029]Peter L. Szanton, letter to Editor, The New York Times, 7 October 1970, text of letter in Shubert Papers, Box 77-B-2, New York City-RAND Institute 1970 Folder, RAND Archives, p. 3.

[1030]Draft essay, "The Future of RAND: A Status Report and a Proposed Strategy," 9 September 1968, Robert D. Specht Papers, Descriptions I Binder, RAND Archives, p. 5.

[1031]Draft speech to RAND board of trustees, Henry Rowen, 23 February 1968, Gustave Shubert Papers, Fundraising/Development/NYC-RAND Institute Box, RAND Archives, pp. 1-2.

[1032]Frederick O'R. Hayes, draft of essay on New York City-RAND Institute history, 7 August 1973, Gustave Shubert Papers, Box 77-B-1, Correspondence-General Folder, RAND Archives, pp. 21-22.

[1033]For example, upon the signing of the initial contracts between RAND and New York City in January 1968, Uniformed Firemen's Association President Gerald J. Ryan commented that the city money could better be spent to hire one hundred "badly-needed additional firemen." Quoted in Ford Foundation Evaluation, p. 14.

[1034]Frederick O'R. Hayes, draft of essay on New York City-RAND Institute history, 7 August 1973, Gustave Shubert Papers, Box 77-B-1, Correspondence-General Folder, RAND Archives, p. 21.

[1035]See memorandum, Peter Szanton to Henry Rowen, "A Board for the New York Institute," 4 April 1969, J. R. Goldstein Papers, New York City-RAND Institute Box, RAND Archives; memorandum, J. R. Goldstein to file, "Conversation with Peter Szanton," 3 April 1969, J. R. Goldstein Papers, New York City-RAND Institute Box, RAND Archives; and Gustave H. Shubert, interview by Martin Collins, National Air and Space Museum, Washington, D.C., 20 May 1992.

[1036]Letter, Peter Szanton to NYCRI board of trustees, 7 November 1969, Gustave Shubert Papers, Box 77-B-2, Housing Folder, RAND Archives, p. 1.

[1037]Ibid.

[1038]Frederick O'R. Hayes, draft of essay on New York City-RAND Institute history, 7 August 1973, Gustave Shubert Papers, Box 77-B-1, Correspondence-General Folder, RAND Archives, p. 30.

[1039]New York Times, 13 February 1970, Section 1, p. 3.

[1040]Such accusations were lent credibility in 1971 when New York Magazine published an article quoting a McKinsey and Co. consultant as saying, "There is a problem when the consultant is assumed to be more objective than a civil servant or academic, or more knowledgeable than a political hack. We are not more objective, we have our own biases. We become eligible for contracts because we are the right social people, we have the right values, and we're trustworthy, just as others, who wear different clothes and have different values. receive their contracts from the clubhouse." He summarized the consultant's role as "helping the executive maintain and consolidate his position, and not help solve the problem." Martin and Susan Tolchin, "How Lindsay Learned the Patronage Lesson," New York Magazine, 29 March 1971, p. 45.

[1041]Letter, Joseph A. Bauwens, NYCRI Secretary and Treasurer, to Morgan Lipton, Assistant Corporation Counsel, City of New York, 27 October 1970, New York City-RAND Institute Papers, Box 23316, 1 of 3, City Council-I 1970 Folder, RAND Archives, p. 2.

[1042]The following illustration is from New York Law Journal, 3 December 1970, p. 19.

[1043]The following description of RAND's and NYCRI's contract procedures is from letter, Peter Szanton to Bethuel Webster, Esq., 31 December 1970, Shubert Papers, Box 77-B-2, Legal Action Folder, RAND Archives.

[1044]E. E. Huddleson report to RAND board of trustees, "The Problem of Payments to the New York City-RAND Institute," December 1970, Shubert Papers, Box 77-B-2, New York City-RAND Institute 1970 Folder, RAND Archives.

[1045]Ford Foundation Evaluation, p. 26.

[1046]Complete Minute Books, RAND Board of Trustees' Semi-Annual Meeting Minutes, November 1970, RAND Archives, p. 4.

[1047]Szanton's analysis indicated that RAND had extended to the Institute a total of $1.4 million. If a decision were taken to close the institute effective immediately, closing costs—principally termination pay and a lease liability—would total an additional $507 ,000. The Ford Foundation had made available to the institute the last increment of its original $900,000 grant, some $335,000. Even after this sum was applied against termination costs, RAND had at risk $1.6 million. Memorandum, J. R. Goldstein to RAND board of trustees, 11 January 1971, New York City-RAND Institute Papers, Box 23316, 1 of 3, Getting Paid Folder, RAND Archives, p. 1.

[1048]Complete Minute Books, RAND Board of Trustees' Semi-Annual Meeting Minutes, November 1970, RAND Archives, p. 1.

[1049]Press release, New York City-RAND Institute, 1 June 1971, Shubert Papers, Box 77-B-2, Press Articles--Public Relations Folder, RAND Archives, p. 1.

[1050]Telegram, Newton N. Minow to Mayor Lindsay, 13 November 1970, J. R. Goldstein Papers, New York City-RAND Institute Box, RAND Archives.

[1051]Memorandum, Peter Szanton to Henry Rowen, "NYCRI--Situation and Prospects," 2 April 1971, Shubert Papers, Box 77-B-2, Discontinuance of the NYC-RI (1971) Folder, RAND Archives, pp. 1-2.

[1052]Memorandum, J. R. Goldstein to file, "Conversation with Ed Huddleson," 6 January 1971, J. R. Goldstein Papers, New York City-RAND Institute Box, RAND Archives, p.3.

[1053]Memorandum, Peter Szanton to NYCRI board of trustees, 8 February 1971, Shubert Papers, Box 77-B-2, Discontinuance of the NYC-RI (1971) Folder, RAND Archives.

[1054]Memorandum, H. S. Campbell to Gustave Shubert, "Thumbnail Description of Several NYCRI Professionals," 15 January 1971, Shubert Papers, Box 77-B-2, Personnel Folder, RAND Archives.

[1055]Memorandum, Peter Szanton to NYCRI board of trustees, 8 February 1971, Shubert Papers, Box 77-B-2, Discontinuance of the NYC-RI (1971) Folder, RAND Archives, p. 3.

[1056]Memorandum, Edwin E. Huddleson, Jr., to file, "Report on Problems of Payments to New York City-RAND Instititute," November 1970, J. R. Goldstein Papers, New York City-RAND Institute Box, RAND Archives, p. 3.

[1057]Beame was ultimately vindicated when, on 24 June 24 1971, the Appellate Division of the New York Court ruled that:

"The [City] Charter explicitly mandates that contracts in a generic sense, involving more than $2,500 are to be public "except in a special case." In the latter situation, the Board of Estimate must approve. We go further. The purpose of the [City] Charter is both ancient and obvious; to prevent the giving of contracts to executive favorites." Quoted in Ford Foundation Evaluation, p. 25.

[1058]Memorandum, "Notes for Meeting with Abe Beame, 2-9-71," February 1971, New York City-RAND Institute Papers, Box 23316, 1 of 3, Getting Paid Folder, RAND Archives, p. 2.

[1059]Memorandum, Peter Szanton to Henry Rowen, "NYCRI--Situation and Prospects," 2 April 1971, Shubert Papers, Box 77-B-2, Discontinuance of the NYC-RI (1971) Folder, RAND Archives, p. 3.

[1060]Memorandum, Peter Szanton to New York City-RAND Institute staff, 18 November 1970, New York City-RAND Institute Papers, Box 23316, 1 of 3, Consultants Issue Folder, RAND Archives, p. 1.

[1061]Joseph Bauwens, report to NYCRI board of trustees, 10 February 1973, Shubert Papers, Box 77-B-1, Board of Trustees Folder, RAND Archives, p. 2.

[1062]In a letter to Henry Rowen dated 26 April 1971, RAND trustee T. Keith Glennan wrote, "A few months ago, you asked Gus to consider replacing Peter. Asked my opinion of this move by Gus, I reacted negatively. My concern had nothing to do with Gus' ability to manage the New York operation. Rather I was concerned about the loss of Gus as a stabilizing and dynamic element in the total domestic program and in the Santa Monica hierarchy." Letter, T. Keith Glennan to Henry Rowen, 26 April 1971, Shubert Papers, Box 77-B-2, Personnel Folder, RAND Archives, p. 2.

[1063]Memorandum, Peter Szanton to Henry Rowen, "NYCRI--Situation and Prospects," 2 April 1971, Shubert Papers, Box 77-B-2, Discontinuance of the NYC-RI (1971) Folder, RAND Archives, p. 5.

[1064]Morris, p. 171.

[1065]Minutes of NYCRI board of trustees meeting, 15 February 1973, Shubert Papers, Box 77-B-1, Board of Trustees Meeting, February 15, 1973, Folder, RAND Archives, p. 3.

[1066]Morris, p. 171.

[1067]The total executive budget for fiscal year 1969-70 was $6.604 billion while city expenditures on NYCRI were approximately $2.0 million. Scot MacDonald, untitled article, Government Executive, June 1969, copy in Gustave Shubert Papers, Box 77-B-2, New York City-RAND Institute 1969 Folder, RAND Archives, p. 45.

[1068]Transcript of City of New York Board of Estimate meeting, 17 August 1972, Shubert Papers, Box 77-B-1, City Officials Folder, RAND Archives, p. 6.

[1069]Maurice Carroll, "Beame Aides Split on Retaining RAND," The New York Times, 23 June 1974.

[1070]Resume, Bernard R. Gifford, December 1971, Shubert Papers, Box 77-B-2, President Search Folder, RAND Archives; and biography of Bernard Gifford, May 1972, Shubert Papers, Box 77-B-1, Untitled Folder, RAND Archives.

[1071]Minutes of NYCRI board of trustees meeting, 10 December 1973, Shubert Papers, Box 77-B-1, Board of Trustees Meeting, December 10, 1973, Folder, RAND Archives.

[1072]"Report on Costs and Benefits," 18 April 1974, Shubert Papers, Box 77-B-1, Report on Costs and Benefits Folder, RAND Archives, p. 1.

[1073]Memorandum, Robert Levine to file, "Log of Dealings with the City, May 2nd through July 9," 8 August 1974, Shubert Papers, Box 77-B-1, City Officials Folder, RAND Archives.

[1074]Ibid.

[1075]"Slippery Water," The New York Times, 23 May 1974.

[1076]Memorandum, Robert Levine to Donald Rice and Gustave Shubert, "The 'New York Office' Option Revisited," 13 February 1975, Shubert Papers, Box 77-B-2, Institute's Future and Business Options Folder, RAND Archives, p. 6.

[1077]Steven R. Weisman, "Re-Thinking New York's Think-Tank Philosophy," The New York Times, 14 July 1974.

[1078]Memorandum, Donald Rice to Robert Levine, "RAND/Institute Shared Support," 24 September 1974, Shubert Papers, Box 77-B-1, Board of Trustees Meeting, 9-25-74, Folder, RAND Archives; and memorandum, Robert Levine to Donald Rice and Gustave Shubert, "The Staying in Business to June 1976 Option: Costs, Benefits, and the Case For," 29 October 1974, Shubert Papers, Box 77-B-2, Institute's Future and Business Options Folder, RAND Archives.

[1079]Memorandum, Donald Rice to Robert Levine, "RAND/Institute Shared Support," 24 September 1974, Shubert Papers, Box 77-B-1, Board of Trustees Meeting, 9-25-74, Folder, RAND Archives.

[1080]Memorandum, Robert Levine to Donald Rice and Gustave Shubert, "N.Y. Institute Options," 15 October 1974, Shubert Papers, Box 77-B-2, Institute's Future and Business Options Folder, RAND Archives.

[1081]Ibid., p. 3.

[1082]Memorandum, Ford Foundation, 18 October 1974, Shubert Papers, Box 77-B-1, Ford Foundation Grant Folder, RAND Archives.

[1083]Ibid., p. 7.

[1084]Preparatory notes for meeting of Frank Stanton, Gustave Shubert and Robert Levine with James Cavanaugh and Robert Bott, 28 February 1975, Shubert Papers, Box 77-B-2, Institute's Future and Business Options Folder, RAND Archives.

[1085]The following account of the 28 February 1975 meeting is from minutes, meeting between Frank Stanton, Gustave Shubert, Robert Levine, and James Cavanaugh and Robert Bott, 28 February 1975, Shubert Papers, Box 77-B-2, Institute's Future and Business Options Folder, RAND Archives.

[1086]For an account of New York City's financial crisis, see Morris, pp. 216-232; Martin Shefter, Political Crisis, Fiscal Crisis: The Collapse and Revival of New York City (New York: Columbia University Press, 1992); and William K. Tabb, The Long Default: New York City and the Urban Fiscal Crisis (New York and London: Monthly Review Press, 1982).

[1087]Morris, p. 220.

[1088]Memorandum, Robert Levine to Frank Stanton, "City Hall and Related Contacts, February 28 - April 8, 1975," 9 April 1975, Shubert Papers, Box 77-B-2, Institute's Future and Business Options Folder, RAND

Archives, pp. 1-2.

[1089]Memorandum, anonymous, 9 May 1975, Gustave Shubert Papers, Project Management Course/ICJ Directorship/Wash Ops Box, RAND Archives.

[1090]Conversation with Peter Szanton, 9 June 1998.

[1091]Ford Foundation Evaluation, p. 153.

[1092]Peter L. Szanton letter to Mitchell Sviridoff, Vice President for International Affairs, Ford Foundation, 15 November 1971. Letter in author's possession.

[1093]Memorandum, Paul Weeks to NYCRI project leaders, "Savings Effected for the City of New York by the NYCRI," 10 May 1971, Shubert Papers, Box 77-B-2, Untitled Folder, RAND Archives, pp. 2-6.

[1094]Gustave H. Shubert, interview by Martin Collins, National Air and Space Museum, Washington, D.C., 20 May 1992, p. 123.

[1095]Peter L. Szanton, "Analysis and Urban Government: Experience of the New York City-RAND Institute," RAND Paper P-4822, April 1972, RAND Corporation, p. 8.

[1096]Ibid.

[1097]Policy Analysis in Action: RAND's Work on the Problems of Modern Society (Santa Monica: The RAND Corporation, 1970), p. 7.

[1098]Herbert Goldhamer, "RAND After 25 Years: A Personal View," 18 June 1973, Robert D. Specht Papers, Miscellaneous Files Box 3, RAND Archives, p. 7.

[1099]Peter L. Szanton, "Analysis and Urban Government: Experience of the New York City-RAND Institute," RAND Paper P-4822, April 1972, RAND Corporation, p. 6.

[1100]Memorandum, Edward Blum to Rae Archibald, "Fire Department Appearance before Council Subcommittee," 23 October 1970, New York City-RAND Institute Papers, Box 23316, 1 of 3, City Council-I 1970 Folder, RAND Archives, p. 1.

[1101]Memorandum, Doug Scott to Peter Szanton, 14 October 1970, New York City-RAND Institute Papers, Box 23316, 1 of 3, City Council-I 1970 Folder, RAND Archives, p. 3.

[1102]Ford Foundation Evaluation, pp. 139-140.

[1103]Steven R. Weisman, "Re-Thinking New York's Think-Tank Philosophy," The New York Times, 14 July 1974.

[1104]Warren E. Walker, Jan M. Chaiken, and Edward J. Ignall, eds., Fire Department Deployment Analysis, A Public Policy Analysis Case Study: The RAND Fire Project (New York: Elsevier North Holland, 1979), p. 589.

[1105]Ibid., p. 597.

[1106]The Wallaces' analysis focused particular criticism on two of NYCRI's core fire deployment models, which provided the analytical basis, the Wallaces claimed, for the elimination or permanent relocation of thirty-five fire companies from high fire incidence areas. The first of these models, called the Resource Allocation Model, focused on the average response times of fire companies to alarms. The objective of this model was to allocate fire companies among the city's geographic regions so as to equalize response times given historical alarm patterns. The second model, the Firehouse Siting Model, analyzed the variable average response distance and travel time and evaluated alternative strategies for locating firehouses within the city's various regions. Both models employed mathematical formulas to relate sampled operating response data to hypothetical operating structures, and NYCRI analysts used the models to prove their claims that "rational" restructuring of fire deployment could increase service levels *and* reduce manpower demands.

In contrast, the Wallaces argued that NYCRI fire models were deeply flawed and led to dangerous policy recommendations. Foremost, they found that the simplifying assumptions built into the models destroyed their validity. The Wallaces concluded that NYCRI's models utilized only three to five parameters each and intentionally ignored complex location-specific variables such as the potential for fire spread between buildings, street design, parking customs, spatial and temporal traffic patterns, neighborhood population age distributions, and arson rates. Furthermore, the Wallaces questioned the assumptions undergirding NYCRI fire deployment models. For example, whereas the institute analysts assumed stable false alarm ratios and predictable alarm rates, these variables may actually change rapidly both by area and city-wide. Finally, the Wallaces argued that NYCRI models provided a poor basis for fire deployment system design because they focused on *average* response times and distances. In fact, the authors pointed out, a fire system must be designed to perform under extreme demand conditions, otherwise service will break down just when it is needed most.Rodrick and Deborah Wallace, Studies of the Collapse of Fire Service in New York City 1972-1976: The Impact of Pseudoscience in Public Policy (Washington, D.C.: University Press of America, 1979), p. 3.

[1107]Kolesar and Walker were awarded the Lanchester prize in November 1975 for their report, "An Algorithm for the Dynamic Relocation of Fire Companies," RAND Report R-1023-NYC (Santa Monica, CA: The RAND Corporation, 1974).

[1108]Ibid., p. 70.

[1109]Ford Foundation Evaluation, p. 74.

Chapter 13

[1110]The circumstances described are detailed in Daniel Ellsberg, Secrets: A Memoir of Vietnam and the Pentagon Papers (New York: Viking Press, 2002), pp. 299-309.

[1111]Rudenstine, p. 34.

[1112]James Gaither, report to RAND board of trustees, 27 July 1971, Shubert Papers, Box 89-1, Board of Trustees Meeting 8/13/71 Folder, RAND Archives, pp. 14-15; and Rudenstine, p. 35.

[1113]James Gaither, report to RAND board of trustees, 27 July 1971, Shubert Papers, Box 89-1, Board of Trustees Meeting 8/13/71 Folder, RAND Archives, p. 14.

[1114]Gustave H. Shubert, interview by Martin Collins, National Air and Space Museum, Washington, D.C., 20 May 1992, p. 55.

[1115]Ibid., p. 62.

[1116]Daniel Ellsberg, transcribed tape recording, 8 April 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives, p. 3.

[1117]Daniel Ellsberg, transcribed tape recording, "Random Thoughts on RAND," 31 March 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives; Daniel Ellsberg, transcribed tape recording, 8 April 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives; Daniel Ellsberg, transcribed tape recording, 10 April 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives; Daniel Ellsberg, transcribed tape recording, "RAND as a Community of Researchers," 14 April 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives; Daniel Ellsberg, transcribed tape recording, "Some RAND Debts to Humanity," 14 April 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives; and Daniel Ellsberg, transcribed tape recording, 22 April 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives.

[1118]Daniel Ellsberg, transcribed tape recording, 22 April 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives, p. 3.

[1119]James Gaither, report to RAND board of trustees, 27 July 1971, Shubert Papers, Box 89-1, Board of Trustees Meeting 8/13/71 Folder, RAND Archives, p. 17.

[1120]Gustave Shubert, "A Progress Report on Development: Programs, Goals, and Prospects," RAND Limited Document D-L-18736-RC, 18 April 1969, p. 1.

[1121]Memorandum, Henry Rowen to department heads, "RAND Research and Study Area Program," 19 April 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives, pp. 1-2.

[1122]Letter, T. Keith Glennan to Henry Rowen, 22 March 1968, Gustave Shubert Papers, Fundraising/Development/Lawsuits/Admin Box, RAND Archives, p. 2.

[1123]Henry Rowen, presentation to RAND board of trustees, "An Introduction to RAND," 14 November 1968, Robert D. Specht Papers, Descriptions I Binder, RAND Archives, p. 5.

[1124]Anonymous, "Air Force Needs of the 1970s," undated report prepared for the Air Staff, Donald B. Rice Papers, Air Force 1967-79 Box 1 of 3, RAND Archives, pp. 4-5.

[1125]Complete Minute Books, RAND Board of Trustees' Semi-Annual Meeting Minutes, RAND Archives.

[1126]The following descriptions are derived from Anonymous, "Research at RAND: Recent Achievements and Work in Progress," 3 September 1972, Robert D. Specht Papers, Descriptions II Binder, RAND Archives; Gustave Shubert, "A Progress Report on Development: Programs, Goals, and Prospects," RAND Limited Document D-L-18736-RC, 18 April 1969; and RAND: 25th Anniversary Volume (Santa Monica: The RAND Corporation, 1973).

[1127]Memorandum, Brent D. Bradley to L. B. Rumph, "The Sacramento Program," 8 September 1971, Mary Anderson/Old Research Council/L.B. Rumph Papers, Box 1, Zwick Committee Folder, RAND Archives, p. 1.

[1128]Gustave H. Shubert, interview by Martin Collins, National Air and Space Museum, Washington, D.C., 20 May 1992, p. 80.

[1129]Joseph A. Kershaw and Roland N. McKean, Teacher Shortages and Salary Schedules (New York: McGraw-Hill Book Company, 1962).

[1130]The text of this report can be found in Pat Sullivan, Snowden, Sullivan & Goodwin, Consulting Psychologists, "Current State of Morale at RAND," 10 June 1968, Edwin McMillan Papers, RG 326, Series XV, RAND Corp. Board Papers, 1954-73, San Bruno NARA Center, Box 1, Folder 6.

[1131]Ibid., p. 10.

[1132]This staffing estimate was consistent with the findings of the Urban Institute's organizing committee. See, Henry Rowen, draft speech for RAND board of trustees, 23 February 1968, Gustave Shubert Papers, Fundraising/Development/NYC-RAND Institute Box, RAND Archives, p. 9.

[1133]Letter, Jerry Jensen to Henry Rowen, J. R. Goldstein, and Steve Jeffries, 14 December 1967, Edwin McMillan Papers, RG 326, Series XV, RAND Corp. Board Papers, 1954-73, San Bruno NARA Center, Box 1, Folder 7, pp. 1-2.

[1134]Henry Rowen and Gene Fisher, "Discussion of Questions and Issues of Apparent Concern to the RAND Staff," 23 March 1971, Donald B. Rice Papers, Box 3 of 4, RAND Archives, p. 12.

[1135]Tom Glennan, "The Conduct of Policy Research: Lessons from the Early History of RAND," 20 April 1981, Mary Anderson/Old Research Council/L.B. Rumph Papers, Box 1, RAND Archives, p. 20.

[1136]Gustave Shubert, "The Evolution of the RAND Matrix System," 25 January 1995, Shubert Personal Papers, p. 14.

[1137]Conversation with Gustave Shubert, 26 May 1998.

[1138]Management Committee Minutes, 21 September 1966, RAND Archives.

[1139]The following account of RAND's study of the airpower effectiveness in Vietnam is taken from "Joint RAND-Air Staff Study for Secretary Brown: The Effectiveness of Airpower in Vietnam," Seminar Background Paper for the RAND Board of Trustees Meeting, April 1968, RAND Document D-16860-PR, 15 March 1968, RAND Classified Archives. No copies of the original briefing or study report could be located at RAND. Review of the RAND classified archives indicates that the original Summary Report was classified Top Secret but, unusually, never assigned a RAND document number. RAND's Top Secret log indicates that the report was "frozen" in 1971, perhaps in conjunction with the security crackdown imposed on RAND by the Department of Defense in the aftermath of the Pentagon Papers' publication. Subsequent to this freeze, the summary report was downgraded to Secret classification. However, all extant copies of the report were destroyed in 1980. All that remains at RAND of this report are some background studies and a summary of its conclusions, which was presented to the RAND board of trustees in April, 1968. This destruction of a crucial classified document is regarded by RAND archivists as highly unusual. The 1968 board presentation is the basis for the present analysis of the air effectiveness study.

[1140]Edmund Dews, "The Air Force-RAND Dialogue: Impressions of a Meeting with Secretary Brown, July 1968," RAND Limited Document D-L-18814-PR, 12 May 1969, p. 1.

[1141]Ibid.

[1142]In 1968, RAND's AFAG comprised about a dozen senior Air Force officers, mainly two-star heads of Air Staff directorates, who were responsible for overseeing the Project RAND research. Management Committee Minutes, 20 November 1968, RAND Archives.

[1143]RAND Management Committee Meeting Minutes, 20 November 1968, Gustave Shubert Papers, DPD files 1967-71, Box 2, Dev Prgm-History Folder, RAND Archives, p. 2.

[1144]History, Deputy Chief of Staff/Research and Development, Directorate of Operational Requirements and Development Plans, 1 July 1968 to 31 December 1968, DCS/R&D Collection, Jul-Dec 1968, vol. 4, AFHRC.

[1145]Newton N Minow, statement for the Secretary of Defense, 31 March 1972, Gustave Shubert Papers, Fundraising/Development/NYC-RAND Institute Box, RAND Archives, p. 4.

[1146]See, for example, Rowen's statement to RAND Department Heads, Memorandum, Henry Rowen to department heads, "RAND Research and Study Area Program," 19 April 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives.

[1147]Henry Rowen, "The Need for a Restructuring of RAND," 26 August 1969, Gustave Shubert Papers, Box 78-C-3, Organization 1969 Folder, RAND Archives.

[1148]Letter, David A. Shepard to Robert C. Seamans, Jr., Secretary of the Air Force, 1 December 1969, Donald B. Rice Papers, Air Force 1967-79 Box 1 of 3, RAND Archives, p. 3.

[1149]Memorandum, Henry Rowen to file, 27 April 1967, Donald B. Rice Papers, Air Force 1967-79 Box 1 of 3, RAND Archives, p. 2.

[1150]Complete Minute Books, RAND Board of Trustees' Semi-Annual Meeting Minutes, RAND Archives.

[1151]Ibid.

[1152]Ibid.

[1153]Memorandum, Richard A. Yudkin to Lauris Norstad, RAND trustee, 17 April 1970, Donald B. Rice Papers, Air Force 1967-79 Box 1 of 3, RAND Archives.

[1154]"Six RAND Experts Support Pullout," New York Times, 9 October 1969. The six RAND signatories on the letter were Konrad Kellen; Oleg Hoeffding, who was a Soviet specialist; Melvin Gurtoff, who was an Asian expert working on Vietnam; Arnold Horlich, who was, perhaps, RAND's most senior Soviet specialist; and Daniel Ellsberg. For the text of this letter, see James Gaither, report to RAND board of trustees, 27 July 1971, Shubert Papers, Box 89-1, Board of Trustees Meeting 8/13/71 Folder, RAND Archives, Attachment 2.

[1155]The events of this meeting are recounted in Memorandum, J. R. Goldstein to RAND board of trustees, 17 October 1969, Shubert Papers, Box 89-1, Board of Trustees--GHS Eyes Only Folder, RAND Archives. For Daniel Ellsberg's account of the RAND letter's publication, see Daniel Ellsberg, Secrets: A Memoir of Vietnam and the Pentagon Papers (New York: Viking Press, 2002), pp. 310-322.

[1156] Ellsberg, Secrets, p. 322.

[1157]Memorandum, J. R. Goldstein to RAND board of trustees, 17 October 1969, Shubert Papers, Box 89-1, Board of Trustees--GHS Eyes Only Folder, RAND Archives, p. 4.

[1158]Gustave H. Shubert, interview by Martin Collins, National Air and Space Museum, Washington, D.C., 20 May 1992, p. 66.

[1159]Letter, Henry Rowen to William R. Hewlett, 24 October 1970, Donald B. Rice Papers, 1972- May 1989 Box, RAND Archives..

[1160]"What if there wasn't a presidential race?", The [Newark, N.J.] Sunday Star-Ledger, 5 April 1970.

[1161]For documentation concerning the 1972 election study rumor, see Books I-IV plus Chronology and Narrative, 1972 Election Study Rumor Box, RAND Archives; especially, "Updated Chronology of the '72 Elections Study Rumor," 22 May 1970, RAND 1972 Election Study Rumor Box, Folder Chronology of Events, RAND Archives; and draft of election study rumor narrative, 1972 Election Study Rumor Box, Folder Election Study Rumor Chronology May 22, 1970, and Narrative June 4, 1973, RAND Archives.

[1162]See "Infrastructure of Repression," The Nation, 27 April 1970; and "Washington Wire," Wall Street Journal, 24 April 1970.

[1163][Seattle, Wa] Post Intelligencer, 19 April 1970.

[1164]"Eye Too," Women's Wear Daily, 13 May 1970, p. 14.

[1165]A text of the address is attached to Henry Rowen, memorandum to Management Committee," 11 June 1970, Management Committee Meetings 1970 Box, Management Committee Meetings Folder, RAND Archives.

[1166]It didn't help Rowen's cause that RAND's board chairman, Newton Minow, was questioned about the election study rumor on national television in June, 1970. Minow was the on-camera guest of Hugh Downs and Barbara Walters on the Today Show, the National Broadcasting Corporation's popular morning program. In the course of interviewing Minow, Downs and Walters raised the issue of the election study rumor, forcing Minow to recount the rumor and offer an explanation for its persistence. Again, RAND, and its board chairman, was placed in an uncomfortable and defensive position.

[1167]Interview with Gustave H. Shubert, 26 May 1998, Santa Monica, CA.

[1168]Ibid.

[1169]Ibid.

[1170]The Price Committee's membership was Don K. Price, chair, Michael Ference, Jr., William R. Hewlett, Lauris Norstad, James A. Perkins, Frank Stanton, and Henry Rowen. Memorandum, Henry Rowen to Price Committee, 11 January 1971, Donald B. Rice Papers, Box 3 of 4, RAND Archives.

[1171]Gustave Shubert recalls Stanton commenting, ""That's truly bad news . . . . You're going to lead RAND into more trouble than you've ever been in before." Gustave H. Shubert, interview by Martin Collins, National Air and Space Museum, Washington, D.C., 20 May 1992, p. 81.

[1172]Robert S. McNamara, In Retrospect: The Tragedy and Lessons of Vietnam (New York: Random House, 1995). For a discussion of the controversy regarding McNamara's motivations, see David Rudenstine, The Day the Presses Stopped: A History of the Pentagon Papers Case (Berkeley: University of California Press, 1996), pp. 20-24.

[1173]Ibid., p. 24.

[1174]Memorandum, Henry Rowen to file, 21 July 1967, Donald B. Rice Papers, Air Force 1967-79 Box 1 of 3, RAND Archives, p. 1.

[1175]Ibid., pp. 1-2.

[1176]Rudenstine, p. 26.

[1177]James Gaither, report to RAND board of trustees, 27 July 1971, Shubert Papers, Box 89-1, Board of Trustees Meeting 8/13/71 Folder, RAND Archives, p. 4. The contributions of the RAND analysts to the Vietnam history study are as follows. In July, 1967, Shubert provided the Task Force with a collection of relevant RAND publications and documents and wrote, with Averch, a paper on the Viet Cong. He subsequently produced two other papers, one dealing with U.S. assistance to the French during the Indochina War and one dealing with U.S. training of South Vietnamese forces during the years 1954-1960. Ellsberg produced a draft paper on the 1961-63 period; Gurtov, a paper on U.S. diplomacy 1945-1954; Heymann, a monograph about U.S. bombing of North Vietnam, 1964-1965; and Simon, three papers dealing with the period 1964-1965.

[1178]Gustave H. Shubert, interview by Martin Collins, National Air and Space Museum, Washington, D.C., 20 May 1992, pp. 57-58.

[1179]Ibid., p. 58.

[1180]A copy of this memorandum is Attachment 1 to James Gaither, report to RAND board of trustees, 27 July 1971, Shubert Papers, Box 89-1, Board of Trustees Meeting 8/13/71 Folder, RAND Archives.

[1181]James Gaither, report to RAND board of trustees, 27 July 1971, Shubert Papers, Box 89-1, Board of Trustees Meeting 8/13/71 Folder, RAND Archives, p. 3.

[1182]Ibid., p. 9.

[1183]Ibid., p. 38.

[1184]Rudenstine, p. 37.

[1185]Conversation with Shubert, 26 May 1998.

[1186]In late 1969, two complete sets of the final report, each a 47-volume set titled, "United States-Vietnam Relations, 1945-1967," were delivered to RAND. These two sets had been authorized for distribution by the Office of the Secretary of Defense to certain recipients, including Warnke, Halperin, and Gelb. These three men, who jointly controlled two sets, directed that their sets be forwarded to RAND for storage. One set was delivered to the RAND Washington Office on 19 September 1969, but was not entered into RAND's classified document control system. The second set was delivered to RAND Santa Monica and logged into RAND's accountability system on 3 October 1969. James Gaither, report to RAND board of trustees, 27 July 1971, Shubert Papers, Box 89-1, Board of Trustees Meeting 8/13/71 Folder, RAND Archives, pp. 11-12.

[1187]James Gaither, report to RAND board of trustees, 27 July 1971, Shubert Papers, Box 89-1, Board of Trustees Meeting 8/13/71 Folder, RAND Archives, pp. 10-12.

[1188]See, for example, Rudenstine, pp. 38-47.

[1189]Gustave H. Shubert, interview by Martin Collins, National Air and Space Museum, Washington, D.C., 20 May 1992, p. 62.

[1190]James Gaither, report to RAND board of trustees, 27 July 1971, Shubert Papers, Box 89-1, Board of Trustees Meeting 8/13/71 Folder, RAND Archives, p. 20.

[1191]Ibid.

[1192]Ibid.

[1193]Ibid., p. 23.

[1194]Sanford J. Unger, The Papers and the Papers: An Account of the Legal and Political Battle over the Pentagon Papers (New York: Columbia University Press, 1989), pp. 81-82.

[1195]James Gaither, report to RAND board of trustees, 27 July 1971, Shubert Papers, Box 89-1, Board of Trustees Meeting 8/13/71 Folder, RAND Archives, pp. 23-24.

[1196]Ibid., p. 26.

[1197]Hounshell and Jardini interview with Henry S. Rowen, 5 December 1994.

[1198]Rowen claimed in an interview with Hounshell and Jardini, 5 December 1994, "I wasn't the person, but I was certainly one of the persons . . . [who] said, 'You really ought to get a history done on this because we got ourselves into one awful mess.'" Rowen's statement is supported in one of Daniel Ellsberg's tape recorded messages to Rowen, dated 22 April 1967. In this message, Ellsberg lists potential topics for RAND research on Vietnam. The second of these topics is "Analytical history of South Vietnam Conflict," which Ellsberg states, "you proposed to McNamara." Daniel Ellsberg, transcribed tape recording, 22 April 1967, Robert D. Specht Papers, Lindblom Binder, RAND Archives, p. 18.

[1199]Conversation with Gustave Shubert, 26 May 1998.

[1200]Ibid.

[1201] Ellsberg, Secrets, p. 322.

[1202]Gustave H. Shubert, interview by Martin Collins, National Air and Space Museum, Washington, D.C., 20 May 1992, p. 69.

[1203]Ibid.

[1204]Semiannual Historical Report of the Assistant for RDA Programming, 1 July 1971 to 31 December 1971, DCS/R&D Collection, Jul-Dec 1971, vol. 1, AFHRC, p. 40.

[1205]Management Committee Minutes, 8 September 1971, RAND Archives.

[1206]Management Committee Minutes, 17 September 1971, RAND Archives.

[1207]Ibid.

[1208]Management Committee Minutes, 15 November 1971, RAND Archives.

[1209]Conversation with Gustave Shubert, 26 May 1998.

[1210]"RAND Revamps for a Civilian Future," Business Week, 29 April 1972, p. 36.

[1211]Semiannual Historical Report of the Assistant for RDA Programming, 1 January 1972 to 30 June 1972, DCS/R&D Collection, Jan-Jun 1972, vol. 1, AFHRC, pp. 43-44.

[1212]Memorandum, Richard Fryklund to record, 21 November 1972, Gustave Shubert Papers, Box 84-2, DoD/RAND Relations Folder, RAND Archives.

[1213]Memorandum, Gus D. Dorough, Deputy Director for Research and Advanced Technology, to John Foster, Director of Defense Research and Engineering, 12 December 1972, Donald B. Rice Papers, Air Force 1967-79 Box 1 of 3, RAND Archives, p. 1.

[1214]Barbara R. Williams and Malcolm A. Palmatier, "The RAND Corporation," in Carol H. Weiss ed., Organizations for Policy Analysis: Helping Government Think (Newbury Park: Sage Publications, 1992), p. 65.