MY LIFE AT CORNELL
By Narahari U. Prabhu, Professor Emeritus

1. INTRODUCTION

This is not a complete record of events that have happened since my arrival at Cornell in 1965. After all, 47 years have passed and memory does not serve us well. Very soon it will be the School's golden jubilee year, and that might be the time to prepare an official history of the School.

Teaching and research at Cornell have been immensely rewarding to me. The purpose of this article is to narrate my professional activities as a member of the SORIE Faculty until my retirement in 1994.

2. FROM IE TO SORIE TO SORIE AGAIN

I came to Cornell in 1965 to join what was then called the Department of Industrial Engineering (IE). Historically this title included topics such as time and motion study, industrial lighting and production planning. These topics were slowly fading away in significance. The Head of the Department was Byron Saunders, a product of that era. Computers had already emerged (but not computer science as yet). Bill Maxwell and Dick Conway were pioneers in this area. Bob Bechhofer and Lionel Weiss (both Columbia University products) were senior faculty in statistics. I was identified as an applied probabilist (on the basis of my 1965 book on Queueing Theory, I suppose), although I had published simultaneously a book on Stochastic Processes which covered theory as well as applications. Mathematical Programming and Game Theory became prominent and new faculty was hired (as detailed below). At this stage, the title IE seemed inadequate to describe all of the new activities. After some discussion it was agreed to maintain the term, Department of IE, for the undergraduate program with Saunders as its Head, and create a graduate program of Operations Research (OR) with Bechhofer as its Director. Later, this somewhat contrived setup came to an end with OR and IE merging into a single unit, the School of OR and IE (SORIE), with Bechhofer as the Director. Saunders moved to another position at Cornell. And now we have SORIE — School of Operations Research and Information Engineering.

The new faculty hired around 1969 included Bill Lucas, Lou Billera, Dave Heath and George Nemhauser. Ray Fulkerson was hired in 1971. The publication of Ray's book (jointly with Lester Ford) was a milestone in OR. Unfortunately, Ray passed on in 1977. Lou moved to Cornell's Mathematics Department and George to Georgia Tech at Atlanta. Bill Lucas moved to

Claremont Graduate School and he passed on soon after that. Dave Heath also passed on. Both Bill and Dave were close to me and I miss them very much.

3. PROBABILITY AT CORNELL

An attractive feature of Cornell for me was its great tradition in probability, going back to the 1950s. When I arrived in 1965, William Feller was still on the Mathematics faculty (he moved to Princeton later [see EDITORS NOTES]). Kai Lai Chung had just moved from Cornell to Syracuse University (and then later to Stanford).Wolfgang Fuchs, Marc Kac, Jack Kiefer, Frank Spitzer and Jack Wolfowitz were all there!

4. FROM ARO MRC AT MADISON, WISCONSIN TO MSI AT CORNELL

In 1970, I was invited by the Mathematics Research Center (MRC), funded by the US Army Research Office (ARO) at Madison, Wisconsin to spend at least two years there. On the advice of Bob Bechhofer I accepted this invitation for one year, 1970-1971. During that time, there was a student movement against the US Army because of its involvement in Viet Nam. Matters reached a stage when the building where the MRC was located was bombed (this happened during the middle of the night and a graduate research student working in the basement was killed). My next visit, in 1973-1974, was relatively peaceful and I was able to do some of my best work there.

But this is not the end of the story. In 1986, ARO decided to relocate MRC away from Madison, and a team from ARO visited Cornell to investigate the possibility of Cornell as the new location. Geoff Ludford (Theoretical & Applied Mechanics) called me in the middle of the night and asked me whether I would be interested in joining him and others in writing up a proposal. In the typical American fashion, I asked him: "What is in it for me?" Well, to summarize what happened then, a Mathematical Sciences Institute (MSI) was set up, with Geoff as the Director and three others as coordinators in their representative areas: Philip Holmes, Lars Wahlbin and myself (as Program coordinator in Statistics and Applied Probability). This lasted for three years (1986-1989). Then the ARO ran out of funds and the MSI came to an end.

5. THE CREATION OF CCSP

In 1971, Julian Keilson of the University of Rochester, New York, invited a group of 20 probabilists to an informal meeting on Stochastic Processes and Their Applications. I was one of the invitees. This meeting

was followed by a second one in 1972 at Leuven, Belgium, convened by Jozef Teugels of the Katholieke Universiteit te Leuven. That year the informal group which had organized these meetings constituted themselves into a committee—the Committee for Conferences on Stochastic Processes (CCSP), with membership representing the three geographical regions: North America, Europe and the rest of the world. Teugels was Chairman of CCSP during 1972-1974. I was a member during 1972-74.

The next few conferences were held in England, Canada, US, Israel, the Netherlands, Australia and so on. I organized the 12th conference at Cornell in 1983.

In 1975, the CCSP was formally affiliated with the Bernoulli Society for Mathematical Statistics and Probability as a subject area committee. As such it was authorized to organize annual conferences on stochastic processes and their applications, and generally play a role in the activities of the International Statistical Institute (ISI), of which the Bernoulli Society is a section. I was chairman of CCSP during 1975-1979.

6. THE JOURNAL SPA

At about the same as the idea of these conferences was developing, a strong need was also felt for a journal that would meet more adequately the publication needs of a large group of probabilists whose areas of interests cover both theory and applications of stochastic processes. By a fortunate coincidence, the North Holland Publishing Company was also interested in publishing such a journal. Negotiations resulted in an agreement to establish a journal: "Stochastic Processes and Their Applications" (SPA) in 1973, with a Board of editors consisting of Kielson and myself (as Principal Editors), Wim Cohen (of the Netherlands) and Ryszard (of the University of Maryland). In 1980 the SPA became an official journal of the Bernoulli Society, with me as the Sole Principal Editor. I served in this capacity until 1984.

7. HOW I HAPPNED TO ARRIVE IN THE USA

I was at the University of Western Australia (UWA), Perth as Reader in Mathematical Statistics (1961-1964). During this time, I had prepared a manuscript of a book on Stochastic Processes. The Editor of Macmillan Company who was visiting UWA at that time forwarded this material to an anonymous referee. The report I received from the referee was so positive that I asked to know who it was. The Editor got the referee's permission to reveal his identity, and it turned out to be Frank Spitzer of Cornell Mathematics Department. Not only that, Frank wrote to me saying that he

had recommended me for a position at Cornell's IE Department. That is how I happened to arrive in America from Australia.

8. QUEUEING THEORY; THE JOURNAL QUESTA

The pioneering work on the theory of queues was done by A. K. Erlang of the Copenhagen Telephone Company during 1909-1920. Independently, valuable work was done by T. C. Fry of the Bell Telephone Company. The Erlang centennial was celebrated in 2009.

The modern probability of queues owes a great deal to two fundamental papers (published in 1951 and 1954) by David Kendall (Oxford and then Cambridge). This work influenced my interest in this subject area. I established some contact with Kendall around the late 1950s.

Over the years my interest in queuing theory had diminished as I had developed a broader area of research which I called Stochastic Storage Systems. This included inventories, insurance risk, dams and data communication. Besides, my professional colleagues started saying queueing theory was dead. So when in 1985 North Holland Publishing Company approached me with a proposal to publish a journal on queueing theory, I was surprised. Before making up my mind, I wrote to the top 18 queueing theorists of that time and asked them: (1) Whether they thought queueing theory was still alive, and (2) If they did, whether they would agree to be editors of the proposed journal. Surprisingly enough, 17 of them said yes to both questions. Well, we have now the journal: Queueing Systems: Theory and Applications (QUESTA), published by North Holland Publishing Company initially, and later by Springer. I was Editor during 1986-1995.

9. THE FUTURE OF OR

To try to forecast the future is very risky, and besides, as an applied probabilist I have played only a modest role in the development of OR. Over the last few years a major expansion of SORIE research activities has taken place and I feel SORIE is now a major school of national stature. I urge the Faculty to be more aggressive in asserting this stature. Also, from the beginning I have wondered whether the Engineering College is a proper home for SORIE. For example, the College Reports rarely (if at all) refers to SORIE activities. This situation is of continuing concern to me.

10. SOME FINAL WORDS

What I have stated so far in this article might sound like self-glorification, so I hasten to acknowledge several professional colleagues

who helped shape my career. The list is rather long, so I restrict myself to these: Joe Gani of Australia, David Kendall of England, Frank Spitzer and Julian Kielson of USA. The last three are no longer with us.

I end this article with an excerpt from a poem by the Israeli poet Yehuda Amichai (translated from Hebrew by C. Bloch and C. Kronfeld):

> ***That's the way to live: stick your hand into the infinite beyond***
> ***of the world, turn the outside inside out,***
> ***the world into a room and God into a little soul***
> ***inside the infinite body.***

EDITOR'S NOTES

According to a biographical memoir on the National Academy of Sciences website, William Feller moved from Cornell to Princeton in 1950. The first volume of Feller's *Introduction to Probability Theory and Its Applications* was completed in his last year at Cornell.

Professor Uma and his wife Sumi Prabhu reside in Ithaca, New York, and as a means of appreciation to the Cornell University Community, have established an endowment in honor of 1913 Indian Nobel Prize Laureate author, poet, musician and educationist, Rabindranath Tagore (1861-1941). The annual series brings authors in modern Indian literature to Cornell and is intended to foster the creative ideals between East and West.