

**“A NICE LITTLE PAPER” – SOME PERSONAL
MEMORIES REGARDING J.N.**

BY

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Sometime, probably in the summer of 1974, in a beautifully located restaurant high above the Pacific, while having a predinner drink Professor Neyman asked me who had influenced me most into becoming a mathematician. I mentioned Klaus Krickeberg under whose guidance I had done my diploma and who had made me go to Berkeley after that. Neyman was not satisfied; he insisted there must have been some earlier influence. Indeed, there was: After I had attended six years of gymnasium (high school) my parents and I were rather reluctant, partly due to financial considerations, to decide for yet other three years of school possibly followed by university. My mathematics teacher at the time, Dr. Richard Herrmann (not even a mathematician by his own education), gave the decisive push. He convinced my father that I should go on. Maybe without Neyman's question I would never have realized that this was at the roots of my academic career, and thus I feel it is appropriate to use the opportunity of acknowledging this now.

Actually my career evolved in a rather irregular way, mostly like the motion of a Brownian particle being pushed by water molecules but occasionally with a heavier push – though also seemingly random. After having finished the Gymnasium I started to work in the chemical firm BASF where I met a student of physics who induced me to start physics at the University of Heidelberg. There I was so much impressed by the analysis lectures of F. K. Schmidt that I changed to mathematics. In my only semester at Munich, Hans Richter attracted me to probability which I continued at Heidelberg under Krickeberg. As mentioned above he sent me to the Berkeley Statistics Department where I was supposed to learn about applications of mathematical methods to biology. When I first told the Department's chairman, L. LeCam, about these plans he immediately sent me to Professor Neyman, and thus I came under his guidance and influence. For the 17 years after that it was from him and his surroundings that I received the pushes determining my further career.

At this time, Neyman was involved in modeling carcinogenesis as the development of cell populations as exemplified by the Neyman-Scott carcinogenesis model (see, e.g., [6]). In its simplest form this is a two-type linear birth and death process (i.e., a branching process) with immigration. Before this background I understand Neyman's reaction: "Biology, that's branching processes, why don't you start reading Harris" [5]. Also J.N. then 70 accepted me as his very last Ph. D. student — I later learned that I shared this distinction with several others, notably with the late Prem S. Puri.

Around this time Neyman's enthusiasm for his $C(\alpha)$ tests was at its height. If my memory is correct, it was in the winter of 1964/65 when he organized a seminar with (in addition to himself) four participants with the aim to "produce a nice little paper" about testing whether galaxies come in clusters. I never found out how much of the final outcome had been ready in Neyman's mind before we started our work. It was developed in a style not very different from his lectures; the four of us were taking turns at the blackboard trying to follow the path that he had in mind. In the regular lecture courses this could occasionally be embarrassing to both the person at the board and to the audience — here this was less so since we knew we were exploring new territory and going detours or reaching dead ends had to be part of the game. Still, when finally our nice little paper [3] emerged, I was left with the impression that it was essentially a Neyman paper with our coauthorship intended to help our reputation and to give us further motivation.

The latter purpose (if this was so) was reached at least for Prem Puri and myself who started joint work on what we considered as a "final generalization of the original problem" of constructing locally optimal tests via Neyman's $C(\alpha)$ method [4]. This cooperation with Prem Puri started a close friendship which was ended all too early by Prem's untimely death in 1989.

Neyman's office door was usually open, so Prem and I (and occasionally others) would just walk in asking for his attention to our reports on progress in our work or for advice when we seemed stuck. Mostly Neyman was a patient listener for some time — then after a look at his watch would say: "Run away, I have to work." After some time he decided to replace these irregular conferences by a regular seminar on Wednesday evenings. Usually there were about four to six of us, one of us would present what he was just working on, this would be followed by a discussion which at some time was stopped by Neyman's: "We are tired." To be tired was the signal that he invited us to continue the evening at Edy's, his favorite ice-cream place. Neyman himself took just coffee, asking one of us to give him some vanilla ice-cream. He disliked hot coffee, when no ice-cream was available he cooled it with ice cubes. Such an evening invariably ended with Neyman buying chocolates for those of our wives who could not join us at Edy's because they had "microorganisms" to take care of.

Occasionally our Wednesday seminar had visitors from outside. One of these, a medical doctor, Dr. Linder from San Francisco, had originally approached Neyman with a request for help. He had data that seemed to indicate that a certain type of tumor always originated from a single cell and wanted to know whether his data were sufficient to support this conclusion. As always when a real world problem seemed to avail itself to modeling Neyman was enthusiastic, and he proposed that I try to build some model involving competition between different types of cells. The outcome pleased him so much that he (again) suggested to write a nice little paper on the subject (see [1] and [2]).

At about this time my wife and myself started worrying that all my efforts would go into "nice little papers" rather than into a Ph.D. thesis. In spite of all friendliness and collegiality that he had always shown it took me as a little graduate student some courage to present this problem to such a great old man. His reaction that I should write up what I had was encouraging, so some time early in 1966 after I had given him a draft of a dissertation he called me on a Sunday morning to come to his house. There he gave me his OK and a drink; then I had to accompany him to his garden where he cut the first rose of the year for my wife.

Neyman liked to surround himself with people from different backgrounds. After colloquium drinks in the Faculty Club he would regularly count the nationalities represented — there usually were many — and talk about the "international scientific community." Occasionally he made everybody recite some poem in one's mother tongue.

The colloquium speakers often were from some field like medicine or biology. Neyman tried to never stop asking questions before he seemed to have understood what the subject matter was all about. Sometimes everybody felt sorry for the speaker, but in the end we had learned more from Neyman's stubborn questioning than from what the speaker had meant to present.

At about the age of 80 Neyman began "to approach the age of maturity," as he called it. He had always had a strong will, now he developed a sort of "benevolent stubbornness" that made it nearly impossible to resist if he had made up his mind to do you some good. This might for example mean that he decided "we need some vacation" meaning that he intended to take you for some days to some resort where you could swim and hike while he was sitting quietly in a room doing his work. In such a context "I never insist" meant you better obey and "this is a free country" implied that *you* were free to do *his* will.

Neyman's generosity was accompanied by a sometimes amazing thoughtfulness. Thus, when (in 1968) he came out to our house with Christmas presents for the children, he pointed out that he as a small boy had liked mandarines but not oranges, so he thought mandarines might be more appropriate — which was true.

Neyman liked to see the positive aspects of life. He always kept telling people what he was pleased with, be it a "nice little paper" or what he felt was an extraordinarily clever idea of an experimental biologist. When his eyesight was still good, you could hear an occasional "Isn't she pretty," — later he commented about the advantage of not seeing well: "Now *all* ladies look beautiful!" Even when reading started to be a problem, Neyman did not stop buying the New York Times. Once while waiting in the car for Betty Scott he explained me that they sometimes had these nice "subversive" articles and had me read the headlines until we had found something subversive enough that he wanted the whole article read to him.

The afore-mentioned Dr. Herrmann who in a way was at the roots of my academic career and Professor J. Neyman who influenced if most had one thing in common: With both of them I felt that they overestimated or rather overly praised my qualifications and that they liked me more than I deserved. One consequence was that a year after I had my Ph. D. I was back to Berkeley on an Assistant Professorship and Neyman tried to have me stay in California. He did understand that my wife and I rather wanted our children grow up in Europe, but he used every opportunity to have me back at least for summer research jobs. In 1980 I had promised my family to "stay home next summer," however, when Neyman called around Christmas time, there was no hesitation on my side. After all this might just be my last chance to see him. And indeed it was: In July of '81 at the Faculty Club after a seminar in which I had been the speaker he had the first of a series of heart attacks which caused his death on August 5, 1981.

Two days before J. N. died I visited him in the hospital together with two Ph. D. students. Before we left he told me that he liked both of them and then after a pause with a very firm hold of my hand: "I like young people." It is these words that I shall always remember as the last words of a man who I first encountered rather timidly as a terribly famous old man and whom over the years I came to consider a friend. Liking young people and trying to help them finding their way into the scientific community is but one aspect in which it is worthwhile following Jerzy Neyman, but it is certainly not the least.

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