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An Accidental Statistician

At an Event Honoring George E.P. Box, 3 June 2010: His speech.

I want to tell you how I got to be a statistician. I was, of course, born in England and in 1939, I was 19 years old. I had been shooting my mouth off throughout my teens about the British Government and the fact that they were doing nothing to stop Hitler.

So when war broke out in September of that year, although I was close to getting a degree in Chemistry, I abandoned that and joined the Army. They put me in the Engineers (and when I see a bridge I still catch myself calculating where I would put the charges to blow it up).

Before I could actually do any of that I was moved to a highly secret experimental station in the south of England. At the time they were bombing London every night and our job was to help to find out what to do if, one night, they used poisonous gas.

Some of England's best scientists were there. There were a lot of experiments with small animals, I was a lab assistant making biochemical determinations, my boss was a professor of physiology dressed up as a colonel, and I was dressed up as a staff sergeant.

The results I was getting were very variable and I told my colonel that what we really needed was a statistician.

He said "we can't get one, what do you know about it?" I said "Nothing, I once tried to read a book about it by someone called R. A. Fisher but I didn't understand it". He said "You've read the book so you better do it", so I said, "Yes sir".

I asked the Army for some literature about Statistics and they duly sent me a number of useful books.

In the next 3 to 4 years I designed and analyzed hundreds of experiments of many different kinds. In my list of published papers the first two described some of that work.

At one point I was having trouble with a statistical problem. A very senior scientist suggested that I contact R. A. Fisher, who asked me to come and see him. The Army did not know how to send a sergeant to see a professor, so they made a railway warrant that said I was taking a horse to Cambridge. It was a beautiful day. Fisher said "let's go and sit under that tree in the orchard, I'll look up the probits and you look up the reciprocals". The specific problem was soon solved and set me thinking about estimating data transformations.

As the War was winding down, it was discovered that the Germans had developed nerve gasses: Tabun and other agents that were orders of magnitude more toxic than anything we knew. So I was part of a team that went to study these at their research station in Northern Germany. We must have seemed a strange lot. About fifty trucks filled with lab equipment slowly making its way through the ruins of Belgium and Germany, manned by all kinds of people: some civilians, some in Army, Navy, and the Air Force uniforms. I helped to design the field trials.

When I finally got my discharge from the Army, they gave me a medal and paid for me to attend University College, London to study statistics under Professor E. S. Pearson.

It took me 18 months to finish my undergraduate degree. I spent the rest of the time doing graduate work.

While I was at University College, my vacations were spent working for a large chemical company: Imperial Chemicals (ICI). I helped them to write a book "Statistical Methods in Research and Production" edited by O. L. Davies and they offered me a job and paid my salary for a year of graduate work.

The next 8 years were some of the happiest in my life. My division in ICI made, among other things dyestuffs, synthetic textiles, and waterproofing and mothproofing agents. An expert group of chemists and engineers developed and improved the complicated processes needed. I quickly got myself involved with them and with their experiments both on the full scale and in the lab. Typically a 1% increase in the yield could give huge profits. To help design effective experiments I had to know all about the processes. I found myself climbing up and down ladders talking and arguing every day with process workers and technical staff.

I enjoyed this, and had no thought of academia, but in the course of solving practical problems, I had come up with a number of ideas for the development of statistical methods and I had written them up and published them.

In 1952 I was surprised to receive a letter from University of North Carolina at Raleigh: an invitation to come for a year as a "visiting professor". The ICI board of directors gave me a year's leave of absence. But they wanted me back and sent me over on the Queen Mary. I had a wonderful year at Raleigh where I met Stu Hunter, then a graduate student. We worked on RSM methods.

After that I went back to England and worked for ICI for 3 more years.

In 1956, John Tukey was calling me from Bell Labs every morning. He wanted me to come to Princeton to be the director of the Statistical Techniques Research Group (STRG) that was being set up. Finally in 1956, I went to Princeton and initiated the group with Stu Hunter, Don Behnken, Collin Mallows, Geoff Watson, Henry Sheffe, Merve Muller, Norman Draper, and others. This group did some excellent research with many publications. That was where I first met Gwilym Jenkins.

We believe that really new ideas in Statistics were most likely to come from careful study of specific scientific problems. One idea we had was to design and build an automatic optimizer, but the faculty at the chemical engineering department at Princeton were not interested.

In 1960 Wisconsin asked me to come and give two seminars: one technical and one on how, if given the opportunity, I would set up a new statistics department. I told them about my ideas and eventually they told me to come and do it.

So I got the department started in the fall of that year in a Nissan hut near the lake and it flooded from time to time with books floating around the floor.

Also the distinguished Chemical Engineer, Olaf Hougen, at Wisconsin, was enthusiastic about our Automatic Optimization idea. And we got some money from NSF. And after three years and many setbacks, we built the Optimizer - and it worked. This was where Gwilym Jenkins and I gained the experience in the use of non-stationary models, dynamics and non-linear estimation we needed to write the book, "Time Series Analysis Forecasting and Control", now in it's forth addition.

The Math department was keen to get rid of all its Statistics courses. So I found myself teaching what became 709, the "Advanced Theory of Statistics". I had seven students, three of which were Bill Hunter, George Tiao, and Sam Wu. I remember that George Tiao was my bell-weather. Whenever he looked worried, I looked at the blackboard to see what I had done wrong.

Early on it seemed to me that students were learning a great deal about statistical theory but very little on how to use it. So I instituted what came to be called the "Monday night beer session". This was not an official course. It happened in my house and there were no course requirements, grades etc. You came if you felt like. Students and faculty were welcomed from all departments. So we had graduate students and often faculty from Statistics, Engineering, Business and Medical School among others. We also had talent scouts looking for people who had problems they wanted to discuss. Typically in 20 minutes or so the problem was presented and then there was a general discussion about how it might be solved. Decades afterwards, from one-time graduates, I continually hear "the thing I remember best and most helpful was the Monday night beer session". I believe people learned how to solve problems there.

There were many things that happened that happened after this time, some of them very amusing. For example, when we had the house on Johnson Street, I was sitting in my office one afternoon and a man came in and started knocking on the walls. I asked him what he was doing and he said that he was checking where the joists were. I said, "Why are you doing that?" His response was, "As you know we are knocking down this house next week." So I called someone in the University and I was told, "Oh no Professor Box! Although that house is scheduled for eventual demolition, this is not likely to happen for another year or two." So I put down the phone and after about 15 minutes it rang, they said, "You're right!! Can you start getting out this afternoon?"

I have been most fortunate in the friendships, and all the kindnesses and support I have received from so many different people throughout my life. And to all those who are here, and to the many who are not, I say thank you.

Reference

1- http://www.stat.wisc.edu/~yandell/stat/50-year/Box_George.html