Profiles in Cardiovascular Science

John Ross: Epitome of a Medical Triple-Threat
Ruth Williams

Preamble by Gerd Heusch:

When I was kindly invited by Dr. Roberto Bolli to write a short preamble to the profile of my revered mentor Dr. John Ross Jr., I felt both honored and challenged. After all, there are more than 60 of us former fellows of his, who were inspired by him early in our career and then moved on to become professors and leaders in cardiology, cardiovascular surgery, or physiology in the US, in Europe, or in Asia. I find it a bit difficult to characterize such a great man who is so unassuming, so I will share with you some of my personal experience.

It is almost exactly 30 years ago that I first met Dr. Ross when I attended my first American Physiological Society meeting in San Diego in 1982. I presented my early work on the precipitation of myocardial ischemia through α-adrenergic coronary vasoconstriction during sympathetic nerve stimulation. After my presentation, a small man in the back of the audience stood up and in very kind and gentle words asked me about the orientation of our implanted piezocrystals in relation to myocardial fiber direction and the potential of sympathetic denervation by coronary instrumentation. I gave a light-hearted answer and everything was fine. The potential weight of Dr. Ross’ question sank in on me only on my flight back to Germany.

I was formally introduced to Dr. Ross in 1984 during the European Society of Cardiology congress in Düsseldorf by my clinical mentor Prof. Dr. Franz Loogen. I mentioned that I was considering doing a fellowship in the US, he asked me what I had in mind specifically (nothing really at the time), and I ended up with his kind invitation to come to Seaweed Canyon Laboratory. In 1985 I showed up in San Diego, funded by a scholarship from the German Research Foundation, which at the exchange rate to the US dollar was very meager to support my family. A few days after my arrival Dr. Ross asked about my funding and decided that this was indeed not sufficient: “I want you to work hard in the laboratory, so you won’t have time to pack bags in the supermarket! Come and see my secretary tomorrow.” From there on, I had a generous extra check every month handed out by Huguette, his secretary, and Dr. Ross never again said a word about it.

Outside the job, Dr. Ross did not easily socialize with his fellows, unless there was one of the memorable invitations to his home when his lively and lovely wife Lola Romanucci-Ross sang for us and he accompanied her almost professionally on the piano.

When it came to define my first project, it turned out that Dr. Ross had very well remembered our first encounter in San Diego in 1982, so he set me up to solve the issue of potential sympathetic denervation by coronary instrumentation. I had a wonderful, extremely productive time at Seaweed Canyon. The most important event every week was Thursday afternoon when Dr. Ross was to hold the weekly laboratory meeting. These were the good old times before molecular biology when you could trace every experiment by going through the paper chart recordings. And this Dr. Ross did, he scrutinized every experiment in an almost ceremonial way, and we could not be sure that our experiment was any good until we had passed his Thursday afternoon scrutiny. He occasionally used a ruler to check our digitized data and almost instantly identified the spot where something was wrong. When identifying and trying to solve a problem that had come up in a given experiment, we regularly had an intense discussion, new ideas evolved and we ended up with a new project.

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After I returned from Seaweed Canyon back to Germany and assumed my current chair in Essen shortly thereafter, Dr. Ross kindly let me come back to Seaweed Canyon for several weeks in the summer for several subsequent years so that I could utilize his resources which were so familiar to me and bridge the gap until I had set up my own institution the way I wanted it. Ever since I left Seaweed Canyon, I had the very quiet but persistent and effective support from Dr. Ross, including a letter of recommendation here and there, and I am sure he did that for all his former fellows.

So my personal experience with Dr. Ross is that of an extremely modest, gentle, and almost shy person with an enormous intellectual intensity and hard working ethics. He was and is the role model mentor who is inspiring, demanding, and rigorous but also generous and supportive. To some of his fellows he was the clinical cardiologist, to others the cardiovascular physiologist, and yet to others the molecular biologist, and in fact he truly was all of that and in excellence. I am proud of being Dr. Ross’ fellow, and I could have had no better mentor.

—Gerd Heusch

John Ross, Jr. MD, Emeritus Professor of Medicine at the University of California, San Diego (UCSD) School of Medicine, has been a hard-working heart scientist for over 50 years.

He is probably best known for developing the technique of transseptal left heart catheterization—which was definitively proven some years later in reperfusion methods for people suffering an acute myocardial infarction,6—which were so familiar to me and bridge the gap until I had set up my own institution the way I wanted it. Ever since I left Seaweed Canyon, I had the very quiet but persistent and effective support from Dr. Ross, including a letter of recommendation here and there, and I am sure he did that for all his former fellows.

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He is probably best known for developing the technique of transseptal left heart catheterization1–4—used initially for assessing hemodynamics in the left atrium and left ventricle, and more recently for interventions, such as balloon mitral valvoplasty and electrophysiological ablations. But with more than 560 research papers under his belt, Ross has, not surprisingly, made substantial contributions to a wide array of basic and clinical areas of cardiology.

In the 1970s, for example, he contributed important work in the field of reperfusion. His studies performed in dogs showed that it was possible to salvage large amounts of heart tissue by reopening coronary arteries even 3 hours after a coronary occlusion.5 This paved the way for life-saving reperfusion methods for people suffering an acute myocardial infarction,6 which was definitively proven some years later in a clinical trial known as the GISSI trial.7

More recently, Ross’s research has taken a turn toward gene therapy. His laboratory recently reported an injection technique for delivering a transgene-containing viral vector to the coronary arteries of hamsters. Using this approach, his team stopped progression of cardiomyopathy in hamsters and prolonged life expectancy to normal.8 In addition to pursuing such varied avenues of inventive research, Ross also remained a dedicated physician and teacher up until his retirement. He taught more than four decades’ worth of medical students and residents at UCSD, and mentored more than 60 research fellows in his laboratory, almost one third of whom were from Japan. Many of his trainees have gone on to have successful careers of their own.

In a recent interview with Circulation Research, Ross extolled the virtues of a three-pronged academic career—that of researcher, teacher, and doctor—but also warned that by taking on all three, young doctors have got to be prepared for a lot of hard work.

Where Did You Grow Up?
I grew up in a suburb of New York City called Bronxville. My father was an ear nose and throat specialist, and he practiced both at the Lawrence Hospital in Bronxville and at St Luke’s Hospital in New York City, so I was introduced early to the medical world.

Did You Visit Your Father at Work?
Yes. I used to go in with him to his office sometimes and I would occasionally watch him operate. I found all this fascinating.

Also, he used to get me summer jobs. One of them was as an elevator operator in St Luke’s Hospital, where I met many of the medical personnel.

Were You Pressured to Go Into Medicine?
Well, when I was about four, my mother decided that I was going to be a doctor. So I was kind of conditioned.

After medical school I decided I didn’t particularly want to be a practicing doctor. I didn’t want to go back to my community and practice medicine, as my mother had wished.

Was Your Mother a Doctor Too?
No, she was a pianist. She gave piano lessons and also performed in concerts.

She taught me to play the piano pretty well. I play some Chopin and Brahms and also play by ear for my wife to sing.

How Did You Meet Your Wife?
My wife, Lola Romanucci-Ross, is a cultural and medical anthropologist, who is a professor at UCSD. We met over a medical student’s thesis; we were selected by him to be his thesis advisors at the UCSD School of Medicine.

Why Did You Decide on Cardiology?
I didn’t differentiate until my surgical internship at Johns Hopkins. While I was there, I got to scrub-in with Dr. Alfred Blalock on many of his Blue Baby operations. I think it was watching blue babies turn pink that got me interested in going into the cardiovascular field.

After my internship, I was sent by Dr. Blalock to the Clinic of Surgery at the NIH under Dr. Andrew Morrow. There, I did research and clinical cardiology—care of postoperative patients and so forth.

Was It at the NIH That You Developed Transseptal Catheterization?
Yes. The methods that were available then were pretty radical. There was something called the suprasternal approach where they stuck a long needle down from the neck behind the clavicle into the pulmonary artery and then into the heart. There was also the transbronchial approach that Dr. Morrow was using, but that was not very pleasant either—they put a bronchoscope down the throat and windpipe and then passed a long needle through the bronchoscope to puncture the left atrium where it lies adjacent to a branch of the windpipe.
I thought, there must be a better way. I used to do cardiac catheterizations from the right side of the heart for people who had atrial septal defects, and one day someone said, why don’t you try to go across the septum in patients without a septal defect, and I thought, well why not?

I devised a special curved needle, and I published a report of the technique used in animals in 1959. And the following year we published a whole series of patient studies, using transseptal left heart catheterization.

What Happened Next?
I stayed at the NIH for several years and then went up to New York in 1960 to finish residency training. First, I went to Columbia Presbyterian Hospital in New York to study surgery. But, then I switched to medicine and went to Cornell and the New York Hospital.

Why Did You Give Up Surgery?
I didn’t like to stand up and sew all day. Also, surgery did not seem to me a particularly intellectual calling.

After that, I was offered a job as a section head back at the NIH. That was 1962. There was a new branch of the NIH called the Cardiology Branch, which was headed by Dr. Eugene Braunwald. He invited me to come back and run two catheterization laboratories. Then in 1968, Gene got an offer to become chairman of medicine at the new medical school at UCSD in La Jolla, California, and he invited me to come out there as professor of medicine and head of the division of cardiology.

I was also offered the opportunity to stay at the NIH and replace Gene in his job, but I decided to try out academia.

Was It a Tough Decision?
Yes, because of the tempting offer to head up a department at the NIH, where I could do pretty much pure research with just a small amount of clinical work. But I decided to try it all—to teach as well as do clinical care and research.

Do You Enjoy Teaching?
Yes, I do. At UCSD I taught cardiovascular physiology to the first-year medical students and I was also on the wards teaching cardiology to the interns and residents at the hospital. I enjoy it.

I was also the cardiology editor for Best and Taylor’s Textbook of Physiology which the students used. Later, I served as editor-in-chief of the American Heart Association journal Circulation.

What Advice Do You Give Your Students Wanting a Career in Academia?
I tell them to choose their mentors well. Get plenty of advice. Also, I think it is important to realize that you must be prepared to raise grant money for research and that much effort will have to go in that direction. That is the first thing most young investigators have to do.

The combination of research, teaching, and clinical care is, I think, a good life. It is a worthy goal, but I have observed that a good many people drop out of the academic track and go into private practice.

Do You Encourage Them to Stay?
Only if they love it and are good teachers and want to do some research. You can be in academia without doing much research—if you are just teaching on the wards and maybe doing a little clinical research—that’s another track, and you usually won’t have to write grant proposals.

Who Were You Inspired or Mentored By?
Gene Braunwald assembled a group of brilliant investigators in the Cardiology Branch and everyone worked well together. The work of his laboratory group at the NIH, including his own studies on heart failure, has sometimes been called the start of the golden age of cardiology. He was a model in terms of attracting talent and organizing a research program.

Did You Pick Up Your Mentoring Skills From Him?
I got some good advice to begin with from him. But then I developed my own style and trained over 60 fellows in my laboratory. Twenty of them became chairmen of departments or chiefs of cardiology divisions.

How Hard Do You Work?
My wife likes to say that I worked night and day. I did work very hard. By hard work I mean long hours, but you know, that is the way it is. You have to write papers to keep your research grants and you have to spend a lot of weekends writing grant applications and papers.

Are You Still Working?
I have been officially retired since 2005. So, I am a Professor Emeritus. I dropped the teaching and clinical work but am somewhat involved in research and am still writing some papers.

Was It Hard to Let Go?
Initially, I continued doing a lot of what I had been doing. Now I’m doing less, but I’m writing more. You phase out slowly. I’m currently writing a book—my memoirs—and it’s coming along.

References
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