The M. S. Swaminathan I know

Bruce Alberts

National Academy of Sciences, Washington DC 20418, USA

I first met M. S. Swaminathan by conference call. It was 1997, and he and I had just been appointed as the co-chairs of the Science and Strategy half of a major review of the entire CGIAR system – the famous Consultative Group on International Agriculture Research, then composed of 16 public sector laboratories spread around the world. The other half of the review was on Management; this part was to be co-chaired by Whitney McMillan, who had recently retired as CEO of the giant agricultural products company, Cargill, and by Maurice Strong, the international diplomat of great renown who would also chair the entire effort. I had not previously met any of the committee members who joined the call, and I found this first meeting rather awkward. Nevertheless, I do remember that Swaminathan's comments seemed particularly thoughtful.

During the next year, I would spend the equivalent of about six weeks of full-time effort working with Swaminathan on our half of the report. First, there were a number of week-long excursions to visit the CGIAR laboratories around the world where most of our committee meetings were held: I managed to attend those in Mexico City (CIMMYT), The Hague (ISNAR), and Nairobi (ICRAF). At the last of these meetings in Nairobi in July 1998, M.S. and I both had a sinking feeling: without our special intervention, the Science and Strategy part of the report would never be finished for discussion at the annual meeting of the CGIAR system at the World Bank in Washington in mid-October of 1998 – our drop-dead deadline. Although our diverse and talented committee had had many fascinating discussions with a series of outside experts as well as among ourselves, most of the central ideas that we had agreed on orally had not been captured on paper. Before leaving Nairobi, we therefore made an emergency plan: M.S. and I would clear our schedules for nine days in September to make possible an intensive joint writing session, just in case should this prove necessary. By mid-August, it was clear this session would be essential, and a few weeks later, M.S. and I settled into a small house in London where we would spend the nine days working with our secretaries to complete our part of the report. The pressure was intense, and all four of us worked 14-hour days to get the job done.

It was during this time that I truly got to know M.S. as a scholar and friend. As a great agricultural scientist and a former director of one of the major CGIAR laboratories, M.S. had an encyclopedic knowledge of both the history and the operations of the very complicated research system that we were reviewing. In complete contrast, I had barely heard of the CGIAR when we began our report, and my own fields of molecular and cell biology were only peripherally related to our main themes.

Even more novel and impressive to me were Swaminathan's deep understanding and feelings for the billions of impoverished people whom the CGIAR, with its central aim of poverty alleviation through agricultural improvement, serves throughout the developing world. His many personal experiences, in India and elsewhere, had led him to develop a unique and powerful vision for how science can best be delivered to the world's poor.

I had spent nearly all of my life in the United States with almost no conception of how 80 per cent of the world's population lives. This CGIAR study, therefore, proved to be enormously educational for me. Perhaps more important than all of the reading and discussions were our site visits, such as one to the eastern shore of Lake Victoria to meet subsistence farmers carrying out scientific, on-farm experiments to increase their maize yields.

Our report, 'The International Research Partnership for Food Security and Sustainable Agriculture: Third System Review of the Consultative Group on International Agricultural Research (CGIAR)' was published in a pre-print form on 8 October 1998, just in time for the big meeting at the World Bank. It was a bold effort that proposed a large number of major changes in the CGIAR system. As I have experienced many times in my career, nearly all of the bold ideas were initially met with resistance, many with the misleading claim that 'we are already doing that'. But now, six years later, many of our most important recommendations are finally being implemented.

In retrospect, this was a truly worthwhile effort for me personally. Despite the enormous amount of time that I had to spend away from my real job as president of the US National Academy of Sciences, working on the report had brought me into contact with a wide variety of new ideas and experiences that profoundly affect the way that I now look at science. But most important, I had developed a strong friendship with Swaminathan, who would continue to broaden my views of science in the world for many years to come.

In particular, M.S. soon invited me to 'inaugurate' some 'information villages' in India, an invitation that I readily accepted knowing that it would expose me to even more new ideas. My first visit to the Swaminathan Research Foundation in January 1999 proved to be even more stimulating than I had anticipated. Under M.S.'s guidance, my wife Betty and I were taken on a whirlwind tour to in-

augurate several of the experimental information villages that he had just established in rural Pondicherry, a harrowing two-hour drive south along the coast from his Foundation in Chennai. There we visited with the small groups of women volunteers in each village who had been recruited by their fellow villagers to run a local knowledge centre.

Unlike the projects of far too many NGOs and government aid agencies, this was clearly an effort that had been carefully designed with deep respect for the intelligence and values of its clients. The scientists who ran this project were humble and realistic enough to admit that they had to learn by doing, using the villagers themselves to shape the project. Thus, before providing a computer and internet connection for a village, its inhabitants were tested to ensure that the project would meet important needs. The villagers began by carrying out a survey to determine the information that the village wanted to have available electronically. They also had to identify a building to house the communications equipment that would be made available equally to everyone in the village, regardless of their social status or cast. In the end, women from the village itself would manage the computers to provide daily weather and market prices, as well as agricultural and health information, to all the inhabitants.

On our first trip, M.S. also showed us other knowledge-intensive innovations that had been introduced into these villages, such as market-oriented mushroom growing by cooperative groups of local people. In subsequent years, my wife and I would return to the same villages, so as to follow the progress made as time passed. In our most recent visit in January 2004, we were startled to discover a completely new phenomenon: the involvement of the commercial banking sector in India in financing small science and technology-based enterprises through cooperative loans to so-called self-help groups of ten to twenty villagers. In these villages of a few thousand people, in which half of the population lives below India's official poverty line, the bankers were making money through collateral-free loans that are insured only through the pride and social cohesion of the borrowers.

The ground-truth experiences that M.S. exposed me to in India were so impressive that they form the basis for several of my recent annual addresses to the members of the National Academy of Sciences. In particular, I have become intrigued with the enormous possibilities for knowledge-based private 'science-based franchises' that spread by local free-market forces. The technological improvements spread rapidly because they are catalysed by a synergistic profit motive: that is, by the combined desire of people in poverty for more income and of local bankers for more profit-making loans to cooperative groups of enterprising poor people. In India, more than 30,000 branches of 500 different banks are now issuing these types of loans to self-help groups (SHGs). Thus far, through more than 700,000 SHGs, more than 14 million poor families (about 70 million people) have been provided with bank credit, with an average loan per SHG of about $700. And the government goal for 2007 was to reach 20 million of India's poorest families, with a total loan portfolio to SHGs of more than 3 billion dollars. In this way, the work of Swaminathan and others is being used to nucleate explosions of innovation that move spontaneously across the countryside.

There are many thousands of such experiments under way today around the world. As scientists, we need to treat them objectively, so as to study and learn from them. Inspired by M.S., I now believe that our next big challenge is to 'make a science out of connecting the world to science knowledge resources'. That is, we need to obtain rigorous data on what works where and why, just as we do in science. This work will be difficult, and it will need to attract some of our best young intellects if it is to be successful. Unlike my own field of molecular and cell biology, where one expects exactly the same results everywhere because the natural world is invariant, this type of work is deeply embedded in the social sciences, where the results one obtains will be highly context dependent, depending on the culture and the conditions that surround the experiment. Thus, one should not expect to find only a single 'best practice' for establishing and maintaining effective internet kiosks or knowledge centres, or for growing mushrooms in resource-constrained environments, etc. Nevertheless, much can be learned from effective research to make our successes much more transferable from site to site. With science and technology moving so quickly, it is especially critical to 'learn by doing' in this way, so that we will be able to make the next wave of discovery even more useful for productive, sustainable economic development.

Swaminathan reminds me a great deal of a second remarkable scientist whose endeavors I have followed for 45 years, the Jim Watson of DNA double-helix fame. Both Watson and Swaminathan have always pushed the envelope of what is possible with relentless energy, and they have first set and then achieved goals that seemed unachievable to most others. Both have built unique institutions for science: Watson the Cold Spring Harbor Laboratory in Long Island, New York; Swaminathan the M.S. Swaminathan Research Foundation in Chennai, India. And both remain inspiring leaders today.

In summary, it has been a wonderful privilege for me to have had this opportunity to recognize, and to try to explain, a few of the tremendous contributions that my friend Swaminathan has made to both his nation and the world. My contacts with him of course represent only a tiny window into his many accomplishments. At 80, M.S. retains all of the energy and idealism of his youth, and he continues to inspire good behavior and more idealism from millions of his fellow human beings on this Earth. For that, we can all be thankful.