

BOOK REVIEWS

very similar to that on chemical weapons. Here, a whole chapter is devoted to the issue of vaccinations with reference to biological warfare.

The book is essentially meant to ward-off the fears of the common man about chemical and biological warfare, it is certainly not meant for political analysts and scientists. For them, there are many books which treat the subject in greater depth. This book gives factual information on chemical and biological agents for a general reader who is assumed to have no prior knowledge on the subject. Especially chapters on basic classes of CW and BW agents have been written well. Also, the history and success of CWC and in comparison, the problems with BTWC have been lucidly brought out.

I found very few factual errors except one on p. 6, where precursors are con-

fused with chemical warfare agents and another on p. 176, where destruction of chemical agents are expected to be completed by 2020. The second statement is contrary to the requirement of the Convention. Though Russia and South Korea are dragging their feet to destroy the weapons, to make a statement that they will take another 18 years is obviously misleading.

American authors are generally biased towards the US government and NATO's views in their critical appraisal. This book is no exception. The end result of the well-crafted seven-year protocol for BTWC became null and void, because the US did not support the protocol at the last moment. After supporting the protocol for long years, it is not clear why the US developed cold feet. It is certainly not due to pressure from the biotechnology industry. It is just a ruse. It is a pity

that the author did not address this problem properly.

In spite of such criticism, this book provides interesting reading. Both in terms of organization of material and the facts presented, I consider the author has succeeded in presenting an excellent up-to-date cogent review. In summary, I recommend the book to those who would like to have some understanding of chemical and biological warfare, the US bias notwithstanding.

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PERSONAL NEWS

Suresh Kumar Sinha

Suresh Kumar Sinha (1934–2002) was born in Bulandshahar District, Uttar Pradesh on 18 July 1934. He lost his mother at a very young age and was educated in a residential school at Anoop-shehar. He received his B Sc degree from Agra University in 1955 and M Sc degree in botany with specialization in 'Cytogenetics and Plant Breeding', also from Agra University in 1957, securing a first class. He was appointed as lecturer in DAV College, Kanpur immediately after obtaining his Master's degree (1957–62), wherein he completed his Ph D working on mineral nutrition aspects of linseed. The desire to learn about plant biochemistry took him to the University of Alberta, Edmonton, Canada, where he finished his second Ph D in 1964 in a record time of eighteen months. His outstanding work on glycine-serine conversion in plants was published in international journals of repute and became part of textbooks in plant biochemistry. He continued as a post-doctoral fellow at the same university before returning to India in 1965, where he was appointed as Pool Officer,

CSIR at the Indian Agricultural Research Institute (IARI), New Delhi. He joined as a plant physiologist at the Central Tuber Crop Research Institute (CTCRI),



Trivandrum in 1966 and worked on tuber crops till 1969. He joined IARI once again in 1969 as senior plant physiologist at the Division of Plant Physiology, eventually becoming Director, IARI (1991–94), and retired as ICAR National Professor (1995–99).

Sinha was a complete plant physiologist and tried to integrate the disciplines of physiology, genetics, biochemistry and breeding in the analysis of research problems. His greatest asset was the novelty of ideas, ability to conduct original research using simple tools and interpret the data to give new concepts. At CTCRI, his laboratory had only an oven, a microscope and an old spectronic 20. He started research on the mechanism of tuberization, source-sink relationship and cyanide content in *tapioca*, an important crop in south India. This research helped in relating starch deposition with root development, highlighted the importance of leaf area for *tapioca* productivity and helped in characterizing the breeders' selection for edible purposes. These were new findings for this crop and are included in books on tuber crops. At IARI, Sinha initiated research on the mechanism of heterosis, a phenomenon which has revolutionized agriculture. I had the privilege of writing a doctoral thesis on this subject under his chairmanship and also co-authoring a review in *Advances of Agronomy* in 1975. In the

review, a hypothesis was proposed to explain the physiological and genetic basis of heterosis, which is quoted in textbooks of genetics. Sinha conducted research on photosynthesis and nitrogen metabolism in relation to productivity of wheat and pulses. At the Water Technology Centre, IARI, he established a school on stress physiology studying the response of wheat, sorghum and legumes to water-variable environments. He published a larger number of papers in national and international journals on drought-stress related research with colleagues like P. K. Aggarwal, K. R. Koundal, G. S. Chaturvedi and myself.

Suresh Kumar Sinha came into contact with many eminent Indian scientists and was influenced by the interaction. M. S. Swaminathan involved Sinha in the deliberations of Intergovernmental Panel on Climate Change (IPCC) which led to extensive experimentation on methane gas emission in paddy fields in India. These studies helped in providing the factual values of methane contribution from India, which were considerably lower than quoted earlier. Sinha continued to stress on the need for more studies on the impact of climate change on Indian agriculture and food security. He wrote several thought-provoking articles on agricultural production, productivity and sustainability. He was concerned with the grain-yield plateau in rice and wheat, nationally and internationally. He felt that agricultural universities have become isolated from other multifaculty universities of science, arts and humanities, and this isolation was not conducive for the growth of agricultural science. He expressed these thoughts in the 29th Lal Bahadur Memorial Lecture delivered at IARI on 14 April 1999 and in the B. P. Pal Memorial Lecture at the National Academy of Sciences, Allahabad. He consolidated his thoughts on the future scenario in Agriculture in 'Vision 2020' document on Agriculture and Food prepared by Technology Information Forecasting and Assessment Council (TIFAC), DST working under the chairmanship of A. P. J. Abdul Kalam. Subsequently, he

also functioned as the Chairman of the X Five-Year Planning Commission Subcommittee on Agriculture.

Sinha was an excellent teacher and was a constant source of motivation to colleagues and students. He expected hard work and commitment from his staff and students and urged them to undertake new and challenging areas of research. He had guided 15 Ph D students. He was elected fellow of Indian National Science Academy, Indian Academy of Sciences, National Academy of Sciences and National Academy of Agricultural Sciences. He started a 'Plant Biochemical Society' in 1974, which published *The Plant Biochemical Journal* and held symposia to promote biochemical research in plants. Subsequently, the society was re-named the 'Society for Plant Physiology and Biochemistry' and the journal, the *Journal of Plant Biology*. Sinha also organized an International Congress of Plant Physiology in 1988 which was attended by 200 eminent scientists from abroad. He compiled a book entitled *Classical Papers of Plant Physiology*, including the works of eminent scientists like J. C. Bose, Dastur and others, and got it released at the congress.

Sinha received several national awards, notable among them being Vasvik Award for Research in Agricultural Science (1985), O. P. Bhasin Award for Research in Agricultural Science (1988), Birbal Sahni Medal (1989), Jawaharlal Nehru Fellowship (1991), Sunder Lal Hora Medal (1993), B. P. Pal Memorial Lecture (1999) and the Jawaharlal Nehru Birth Centenary Award (2000). He occupied several important positions in his career, including President, Agriculture Section, Indian Science Congress Association (1986–87); President, Agriculture Society of India (1986); Secretary General, International Congress of Plant Physiology (1988); Secretary, National Academy of Agricultural Sciences; Secretary, Society for Plant Physiology and Biochemistry; Secretary General, 2nd International Crop Science Congress (1994–96), and Presi-

dent, Society for Plant Physiology and Biochemistry.

Sinha had a desire to utilize the knowledge available in agricultural science for the benefit of farmers. This prompted him to establish a 'Centre for Environment, Agriculture and Development' (CEAD) in 1993, which had a major objective to render help, guide and advice on scientific methods in agriculture, approaches to protect the environment and to initiate a process of development. In the Vision 2020 document, TIFAC had identified Eastern UP, Bihar, Orissa, Eastern MP, West Bengal, northeastern India and Uttaranchal as regions with low productivity despite high productivity potential, and which therefore needed focus as well as strategic action. With the financial assistance provided by TIFAC, Sinha initiated agricultural developmental projects in Bihar, Eastern UP, Orissa, Kanjipuram, Pinder Valley, Uttaranchal and Sikkim, so that Vision 2020 could become a mission and reality. He had the support of Abdul Kalam, then Chairman TIFAC and Principal Scientific Advisor, Government of India. His endeavours resulted in increased productivity of wheat and rice, and motivated the farmers to diversify the cropping system by including pulses, oilseeds and vegetables in their cultivation.

Sinha was a kind, warm-hearted, simple person who believed in the inherent goodness of mankind. He was broad-minded and open to change. The void created by his untimely demise will be felt by the scientific community and his colleagues. His approach to life can be summed up as follows: 'Do not follow where the path may lead... Go instead where there is not path and leave a trail'.

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