

BOOK REVIEWS

physics (and materials science) is about real materials. The author could have included examples of real materials and also brought to the attention of readers some typical applications of the material of a given chapter. This would have significantly improved the usefulness of the book. For instance, in the discussion of mechanical properties, it would have been useful to point out the relevance to MEMS or in the discussion of strain to the strain engineering of materials. I confess that the choice of these examples is driven by the bias of the reviewer. To be fair, most books do not focus on real materials or stress the possible applications. It is hence all the more reason for a modern book to do this and I hope that it will be rectified in a subsequent edition.

There are many errors – some arising primarily due to inaccurate statements. For example, the statement on p. 604, ‘The Fermi level plays the role of a potential which directs the flow of electrons.’ A more accurate statement would be: ‘The gradient of the electron (hole) quasi Fermi level is proportional to the electron (hole) current.’

Another example on p. 593 states, ‘Metal films having thickness greater than 100 nm are totally absorbing’. In reality, metal films have high reflectivity and only the fraction not reflected can get absorbed. There is some clarification in the following page – but can add to the confusion of the student. Similar confusion exists in a discussion related to the plasma frequency. There are many

such errors in the book and these should be corrected at least in the next edition.

Notwithstanding these shortcomings, overall this is a good textbook on materials science. The publishers have not priced it prohibitively high and hence it can easily find a place in college libraries. This fact, along with the worked examples makes it a good reference book in a first course on materials science.

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PERSONAL NEWS

Shyam Swarup Agarwal (1941–2013)

S. S. Agarwal, former Director, Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGI-MS), Lucknow, passed away on 2 December 2013 following a massive heart attack. He was a legendary figure in medical sciences, who excelled in whatever he did and acted as a role model for his students and colleagues.

Agarwal was born in Bareilly, Uttar Pradesh (UP) on 5 July 1941 to Satya Swarup Agrawal and Shyam Dubari. After obtaining his B Sc in 1958 from Lucknow University, he qualified for MBBS (Hons) with distinction in 9 out of 10 subjects in 1963, and MD (also with Hons.) in medicine in 1966. This performance in his UG course continues to remain a record for the institution till date. He was awarded the Chancellor’s Gold Medal for being the best student amongst all the faculties of Lucknow University in 1963. In 1967, he was awarded a postdoctoral fellowship of the International Agency for Cancer Research, and proceeded to work at Fox Chase Cancer Centre in Philadelphia, USA, where he specialized in the fields of genetics and immunology. His major research contribution was the discovery of the role of DNA polymerase in initiation of DNA synthesis in resting human

lymphocytes upon stimulation with phytohemagglutinin. He also made significant contributions to studies on fidelity of DNA polymerases and DNA repair.

Agarwal returned to India in 1970 and started his teaching career as a lecturer (1970–73) in medicine at his alma-mater, the King George Medical College (KGMC), Lucknow and then became a



reader (1973–86). Soon after joining KGMC, he set up a Medical Genetics Unit in the department which started spreading the importance of genetics in

medicine. This led to the department getting several multi-centric ICMR Task Force projects in the field of medical genetics, such as study of genetic effects of MIC gas leak in Bhopal and delineation of Handigodu disease, which has peculiar geo-ethnic traits from Shimoga district and few talukas in Chikmagalur district of Karnataka. Agarwal’s studies identified it to be a unique type of autosomal dominant spondylo-epiphyseal dysplasia, which has been recognized in the international classification on skeletal dysplasias as a separate entity. Another of his major contributions during this period was the clinical trial of guggulipid, a product developed by the Centre Drug Research Institute (CDRI), Lucknow as a hypolipidemic agent, based on gum guggul (an important drug of Ayurveda). During the course of this project I had an opportunity to closely interact with him. It was a pleasure to see his depth of understanding in designing the clinical trial protocols and the meticulousness with which the phase I–IV clinical trials were carried out and monitored. Results of these trials were closely monitored by a high-powered committee set up by DCGI, and cleared without any questioning. This led to the marketing of guggulipid in India as a modern

phytopharmaceutical. Agarwal thus emerged as a highly reputed and respected teacher and researcher in the department.

In the early 1980s, the UP Government decided to set up SGPGI-MS in Lucknow and Agarwal played an active role in its planning. He was a member of the team that was sent by the UP Government to various leading medical institutions world over to draw a blueprint for the institute. He also actively participated in discussions with the expert teams from the Japanese Government that provided a generous grant-in-aid for equipping the new institute. When the institute was established in 1986, Agarwal moved there as professor and Head, Department of Medical Genetics and Clinical Immunology (1986). His vision of establishing the specialties of medical genetics and clinical immunology, the first of their kind in India at that time, led to their spread; the seeds that he had sown started to grow all over the country. Not only is Agarwal considered the father of medical genetics and immunology education in India, but he also became the steering force for research in these specialties in the country. He headed various task-force committees of ICMR, DBT, DST such as for thalassemia control, lysosomal storage disorders, newborn genomic screening, stem-cell research, etc. and guided the younger generation in these fields. Agarwal served as the Director of SGPGI during 1993–97 and 2000–01. He greatly expanded the research landscape of the institute and emphasized that medical research is needed to back up the clinical contribution of the physicians to provide full benefits of the knowledge available for

the benefit of the patients. He also tried his best to give full administrative support to the academic and clinical work of the faculty. He fully integrated basic research and clinical studies and set an example how these two facets of a clinician should be integrated. In addition to his continuing studies on Handigogu syndrome, his research studies also included characterization of mutations of β -thalassemia in the population of UP, studies on Indian childhood cirrhosis, evaluation of genotoxic effects following the Bhopal gas tragedy of 1984, genetic causes of mental retardation in India, prevalence and spectrum of congenital malformations, delineation of genetic syndromes, albumin variants in North American Indians, familial hyperlipidemia in coronary atherosclerotic heart disease, studies on the immunogenetics of recurrent spontaneous abortion, evaluation of indigenous plant products and synthetic peptides for immunomodulatory activity, seroepidemiology of malaria, studies on lymphocyte biology and so on.

Following his superannuation from SGPGI in 2000, Agarwal accepted another challenging task of activating the newly established Advanced Centre for Treatment, Research & Education in Cancer (ACTREC), a research wing of the Tata Memorial Centre at Kharghar, Navi-Mumbai. He was its founding Director from 2001 to 2004, and made the institute functional before he returned to Lucknow to become an advisor at CDRI as a Senior Scientist and Honorary Director, Research and Academics, Vivekanand Polyclinic and Institute of Medical Sciences, which kept him fully occupied till the last day of his life.

Agarwal was the recipient of practically all the prestigious science awards of the country, including the Shanti Swarup Bhatnagar Prize, the Ranbaxy Award for clinical research and the Vigyan Ratna Award of the UP Government. He was elected a Fellow of the Indian Academy of Sciences, Bangalore (1985); Indian National Science Academy, New Delhi (1995); National Academy of Sciences, Allahabad (1998), and National Academy of Medical Sciences, New Delhi. He is also a Founder Fellow of the Indian College of Physicians, Mumbai. He delivered several prestigious national lectures, including the Glaxo Oration; Gen. Amir Chand Oration of the National Academy of Medical Sciences, New Delhi; Jawaharlal Nehru Birth Centenary Lecture and T.S. Trimurti Memorial Lecture of the Indian National Science Academy; B.C. Guha Memorial Lecture of the Indian Sciences Congress Association; J.B. Chatterjee Memorial Oration and J.B. Parekh Memorial Oration of the Indian Society of Hematology and Blood Transfusion; Bhatia–Misra Oration, Mathur–Mehrotra Oration and Krishnamurthy Oration.

Agarwal is survived by his wife, daughter and son. He has left behind a rich legacy of contribution to medical genetics and immunology and his demonstration of integrating medical research and patient care, which will keep his memories alive for generations to come.

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