

ries of hearings, there was a moving and prophetic testimony rendered by the Secretary of the Viswakarma Mahajan Conference Committee, who stated that while the artisans were '...the industrial backbone of the country, they were not going to be the beneficiaries of the new policy regarding technical schools'. He observed that most of the manual workers were not educated and lacking exclusive literary training, were ineligible for technical scholarships. Citing the 1911 Census Report on the 'complete disassociation with the intellectual class in the country from its industries', he remarked that 'the mistake lay in the very first steps taken', viz. in the selection of students to go to foreign countries for training from communities other than the industrial or artisan classes, who possess the initial aptitude for manual labour which a university graduate of any other class despised as derogation of his caste dignity or literary merit<sup>7</sup>. Sadly, it appears that this divide continues even today. While the authors have taken note of activities of bladesmiths of USA, no interaction seems to exist with the Viswakarma community of our own country.

On the whole, the book is well produced and beautifully illustrated, with nice photographs and artwork. The text is by and large free from typographical errors, barring some stray instances (spelling of *Arthasastra* on p. 15, the name of Verhoeven misspelt on p. 64, etc.). Greater care could have been exercised in a few cases. While describing Figure 17, the authors state that the picture contains '...a touch of pathos conveyed by the playing of the harp', while the figure shows what seems to be a *Tambura*, and certainly not a harp. It is also a little painful to see what is today widely recognized and accepted as India's first war of independence of 1857 being described as the 'Indian mutiny'.

The major shortcoming of the book is the almost exclusive reliance on literature and testimonies from the West (including 'travellers tales'), with little attention to Indian language sources. It also appears as if the authors' awareness regarding Indian developments and initiatives in this area may have been confined to published papers in scholarly journals due to which they have missed out on certain rich sources of information and insights from India. One certainly needs to guard against the ethnocentric bias that permeates some of the Western sources. In his

landmark publication on Indian science and technology in pre-British India, the doyen of Indian science historians, Dharampal has made deeply perceptive observations on this matter, pointing out how the British Royal Society was also part of such ethnocentric bias<sup>8</sup>. Helenus Scott, in his communication to the Royal Society in 1794, sent them a sample of Wootz and wrote that 'it appears to admit of a harder temper than anything we are acquainted with'. However, when this communication was published by the Royal Society in *Philosophical Transactions*, the article quoted his letter as '...admits of a harder temper than anything known in that part of India'. Today the bias may not be so obvious in writings from the West, since the discourse has become much more sophisticated. However, the pitfalls of an exercise with a heavy reliance on only Western sources for Indian technology are quite obvious.

Despite some of the shortcomings, the book is undoubtedly a significant achievement. It marks a new phase in our studies on this important material from ancient India. There is no doubt that future work on this subject can get strengthened and enriched considerably by also drawing inspiration from not only Indian source material, but also our traditional metal workers and artisans, who are still the carriers of this tradition in a significant sense. The book certainly deserves a place in every collection about the history of metallurgy and in the library of anyone who is interested in the history of science and technology in India.

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***Heliothis/Helicoverpa Management: Emerging Trends and Strategy for Future Research.*** Hari C. Sharma (ed.). Oxford and IBH Publishing Company Pvt Ltd, New Delhi. 2005. 469 pp. Price not mentioned.

This unique volume highlights the diverse management strategies against the cotton bollworm *Helicoverpa/Heliothis*, whose adaptations to exploit transient habitats created by the intensification of agriculture, have made them major pests causing huge economic losses worldwide, including the semi-arid tropics, USA, Canada, Australia and South America. Their high mobility, polyphagy, high reproductive rate, ability to diapause and development of high level of resistance, are contributory factors towards the pest status. This book therefore is a timely publication presenting diverse positive strategies currently in use against *Helicoverpa armigera* in India and *Helicoverpa zea* and *Helicoverpa virescens* in other countries. The volume comprises 24 chapters written by specialists across the globe on diverse facets of bollworm biology, bioecology and management strategies involving a combination of strategies for the traditional cultural management, biological and chemical control and genetic engineering.

Host plant resistance has received more emphasis on the physical and chemical mechanisms of resistance as well as utilization of wild relatives of crops for resistance. Of particular interest are the chapters on the development of transgenic crops for resistance, resistance to *Bt* and insecticide resistance management strategies. Recent trends of research have been well discussed, especially molecular

## BOOK REVIEWS

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breeding of *Helicoverpa*, resistance to gram legumes, alternative molecules as candidates for genetic transformation of crops for resistance and strategies for development of *Helicoverpa*-resistant transgenic crops.

Interesting and useful information has been presented in terms of the adoption of Integrated Pest Management (IPM) approaches, which have expanded dramatically in cotton production in countries like Australia. Adoption of IPM has been facilitated by on-farm demonstration, and increased availability of selective pesticides and transgenic crops which are compatible with IPM. Emphasis has been laid on an integrated approach to the *Helicoverpa/Heliothis* problem, so that it may be possible to achieve a long-term goal of sustainable pest-management strategies with minimal impact on the environment.

Monitoring and forecasting *Helicoverpa/Heliothis* population are discussed besides the life table analysis emphasizing key mortality factors, success and failure and emerging trends in the management and prospects of future research. Equal emphasis has been laid on high priority of biotech-assisted programmes using multidisciplinary teams that embrace the application of genomics to enhance utilization of genetic resources in plant breeding programmes. The role of biotechnology acting as a functional bridge between germplasm collections has been highlighted with breeding programmes facilitating the mining of genetic resources for drought, insect and disease resistance. Recent trends in research involving molecular breeding of *Heliothis* resistance to gram legumes, alternate molecules as candidates for resistance and strategies for development of *Helicoverpa*-resistant transgenic crops have also received considerable attention.

In today's scenario, management of *Helicoverpa/Heliothis* holds priority and the book under review brings to light multidimensional profiles of the subject, by a host of competent authors whose practical experience in the field, notably

scientists of ICRISAT, has brought to light some of the major problems and solutions to the same. The editor Hari C. Sharma, a competent entomologist, needs to be congratulated for compiling this useful and excellent volume, which should adorn the shelves of entomologists and agricultural scientists.

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**Seeds of Plenty, Seeds of Hope – On-farm Conservation of Indigenous Genetic Resources: The Asian Experience.** K. Vijayalakshmi and A. V. Balasubramanian. Centre for Indian Knowledge Systems, No. 30, Gandhi Mandapam Road, Kotturpuram, Chennai 600 085. 2004. 136 pp. Price: Rs 200.

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This is a timely book since both the Plant Variety Protection and Farmers Right Act 2001 and the Biodiversity Act 2002 have now become operational. Both these Acts emphasize the importance of conserving biodiversity at three levels – ecosystem, species and varieties/land races. In the past, *in situ* on-farm conservation of intraspecific variability was common. Such conservation traditions are now either disappearing or getting diluted. *Ex situ* conservation of perennial plants through botanical gardens and arboreta was also common. Species of keystone value were preserved in sacred groves. As the pressure of population on precious bioresources increases, the urgency of conserving intraspecific variability in village-level seed banks and cryogenic gene banks has increased. This is where the present book which deals with traditional seed conservation techniques is a timely one.

The book consists of a series of papers dealing with different aspects of community seed management. The papers clearly bring out the need for conservation as well as the search for new genes. I would like to congratulate and thank K. Vijayalakshmi and A. V. Balasubramanian for putting together a series of useful papers. These papers are based on practical experience and hence are valuable, since one ounce of practice is worth tonnes of theory. We should rapidly multiply live gene banks both in crop plants and farm animals. Such live gene banks can be set up in the epicentres of agrobiodiversity.

The experience gained in other countries like Bangladesh is also described in detail. The relationship between biodiversity and food security has been brought out well. Biodiversity is not only the feedstock for the biotechnology industry, but it is the very backbone of food and nutrition security systems.

The authors have compiled examples of community conservation and organic farming in a meaningful manner. Gender dimensions of biodiversity conservation have also been highlighted. This book will be found useful by scholars, non-governmental organizations and others interested in assisting local communities to conserve biodiversity. I am glad the book deals with nutrition in a holistic manner. If the various suggestions contained in this book are brought together for implementation, they will help launch an integrated gene management system involving an appropriate mix of *in situ* and *ex situ* conservation and *in situ* on-farm conservation methods. We owe a deep sense of gratitude to Vijayalakshmi and Balasubramanian for sowing the seeds of an integrated gene management system in our country at the community level.

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