The second aspect of pest management is chemical control of crop pests. Zlotkin, in his review on 'the insect voltage-gated sodium channel as target of insecticides' suggests that due to its pharmacological uniqueness, the insect sodium channel (ISC) may serve as a high-priority target for future selective and resistance-manageable insecticides. Pharmacological specificity of the ISC may lead to the design of insect-selective toxicants, and its pharmacological flexibility may direct the use of ISC insecticides for resistance management. Likewise the review on 'insect P450 enzymes' by Feyereisen, talks about how these enzymes play a very important role in insecticide resistance. This review, I believe will open up research on the inhibitors of insect P450 enzymes.

The third aspect of pest management is the protection of crops against vector-borne viral diseases by effectively controlling the vectors. This topic is addressed by Perring *et al.* In order to effectively control any disease it is very important to have adequate knowledge of the disease epidemiology. This is very well brought out in the review by Perring *et al.*

Yet another way of overcoming food shortage is by looking for alternative food sources. In this regard the review by DeFoliart on 'insects as human food' could not have come at any better time! Insects like alate termites are being occasionally consumed mostly by the tribals in the third world countries. In that sense there is nothing new about insects being used as human food. But, what is important is the attitude of the western world on this issue. The western culture is spreading like wild fire in the developing and underdeveloped countries. In this sense I agree with DeFoliart that the western attitude towards insects as alternate source of food is important. This review will hopefully turn entomologists into looking for insect species that can be used as human food.

The use and management of other insects and non-*Apis* bees for crop pollination is important as in many crops in many locations the ability of honey bees to pollinate is limited. Heard reviews the role of stingless bees in crop pollination. To quote Heard: Stingless bees possess many characteristics that enhance their importance as crop pollinators both as wild populations and managed pollinators. Some of their social life characteristics like perenniality, polylecty, floral constancy, recruitment, harmlessness and resistance to diseases and parasites of honey bees suit them for pollination. Challenges to their widespread use include the lack of availability of large numbers of hives and the dearth of knowledge of the pollination needs and major pollinators of tropical crops. Stingless bees display greater diet breadth (play an important role in pollination of ~ 250 species) and range of foraging behaviour than honey bees, making them likely to be important to future development of pollinators best suited to the needs of particular crops and habitats. A combination of stingless bee species can be employed to pollinate a given crop. Such studies have hardly been attempted. Like Heard, I sincerely hope that this article will stimulate the necessary observations, experimentation and publication on this line.

A review on mate choice in tree crickets by Brown highlights the lack of data on the decision rules the females follow in choosing the males. There is no information on the role of chemical cues in female choice in the Orthoptera. Brown, in a large number of places, quotes his unpublished work. I believe reviews are meant to put published literature in a comprehensive form and draw plausible inferences and indicate future line of work. Therefore, citing unpublished data should be avoided for the simple reason that they have the danger of being cited pending verification by other workers in the field. That aside, there are several interesting questions that can be asked in a system like crickets due to their uniqueness, in the sense that females are in perfect control of the entire process of mating. One such question is, do females cheat? For example, when a female is hungry she may copulate with even an inferior male for the sake of the gift (as her survival itself depends on it) and after feeding she can remove the spermatophore and eat it and then look for a better male.

One would realize that about 70% of my review consists of chapters that have directly or indirectly dealt with agricultural entomology. This is because about 50% of the articles in this volume deal with this aspect. There are also reviews on mites in forest canopies, the evolution and development of dipteran wing veins, diptera phylogeny, emerging and resurging vector-borne disease, density-dependent physiological phase in insects and so on. The editors have done a commendable job in catering to workers in various fields of entomology from ecology to medical entomology. An overview of the contents of this volume of *ARE* provides a feel for the diversity of topics covered.

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Nurturing Biodiversity: An Indian Agenda. Madhav Gadgil and P. R. Seshagiri Rao. Centre for Environmental Education, Ahmedabad. 1999, pp. 163.

At a time when conservation of the earth's biological diversity (biodiversity) has become more of a social challenge than ecological science, several initiatives have arisen worldwide. And although this transition widely prevailed since the 1972 Stockholm Conference on Human and Environment Development, the UN Convention on Biological Diversity, that came into force in 1993, fully reinforced the need for a social approach to conservation and sustainable use of the earth's biodiversity.

The main emphasis of the UN Convention on Biological Diversity (CBD) is on conservation, sustainable use and equitable sharing of the benefits that arise from the use of biodiversity. All of the nearly 175 nations that are signatories to the CBD are thus obliged to nurture the biodiversity within their respective political boundaries guided by the provisions of the CBD.

India is a signatory of the CBD since February 1994. Amongst the signatory nations, India has some unique qualities. Firstly, it has been globally ranked amongst the 12 megadiversity countries.

Two of its biogeographic provinces, viz. Western Ghats and Eastern Himalayas are considered as 'hot spots' of biodiversity. In fact there are only 18 such hot spots throughout the world. Despite India's large human population and the great diversity of cultures, its land and waters shelter a wide variety of natural habitats and an estimated 500,000 species of living organisms. It is also widely acknowledged that such a remarkable heritage of biodiversity is not merely the product of the varied geography of the country but its people and their time-tested conservation traditions.

Efforts to conserve India's biodiversity have constantly evolved over the millennium. However, what has often been projected as 'conservation' in the country is the more recent system of protected areas: wildlife sanctuaries, national parks and biosphere reserves. These are all government initiatives and despite being successful in declaring nearly 5% of the country's surface area as legally protected, the entire system has attracted a considerable amount of criticism and has often been rated as 'flawed' by the import of western ideals – ideals that exclude people from the parks.

The book under review has made an attempt to discuss in fair detail the inherent weaknesses of the existing system of biodiversity conservation in the country. It highlights the merits of the traditional systems of biodiversity conservation in India and proposes means to integrate these into a more meaningful countrywide system of management wherein the participation of people is more guaranteed.

The recommended approach to conservation of biodiversity in India is based on the recognition of two key principles: (1) there are valuable elements of biological diversity in all parts of the country's landscape, waterscape and seascape; within and outside protected areas, in pristine as well as highly human impacted ecosystems and (2) conservation of biological diversity does not call for total exclusion of all human use. Another key point that is repeatedly made in the book is that the Indian society has by and large been highly inefficient in the use of both its natural resources and the available informational resources. Such a weakness has been attributed to a centralized non-transparent bureaucracy that the country has adopted from the British Raj – a system that still prevails in its pristine form especially in the forest departments.

An alternate strategy for managing India's biodiversity adopting a system that is less bureaucratic, more transparent, decentralized and participatory is what more than half the book is about. It outlines, what is proposed as the most appropriate strategy, in great detail starting at the level of the *gram sabhas* of the village, neatly weaving it through the political limits of the districts, states and nation and finally linking it to the international driving forces. Such a hierarchical system of biodiversity management begins at the level of the village with the election or selection of what has been termed a Village Nature, Health and Education Committee (VNHEC) which could serve as the trustee for the management of both biological and knowledge resources. And as a tool primary to the management of these local resources, the People's Biodiversity Registers have been recommended.

Sustainable management of biodiversity involves conservation and prudent use. Conservation efforts both in the past and now have kept aside certain portions of biological resources – species, communities or habitats, untouched by human beings. Such well-preserved fragments of biological resources, as the authors have rightly pointed out, are essential for the sustainable management of maximum levels of biodiversity in any landscape. In this context while the significance of sacred groves are repeatedly highlighted, an attitude condemning the exclusion of people from the modern system of protected areas does not seem justified. Is it solely because the former is an indigenous intervention? Or is it being managed more democratically? The system of sacred groves has its inherent weaknesses which, apart from factors of ecological significance, especially the often small size, suffers from the monopoly of temple management and social inequity when it comes to access. In fact, many sacred groves in south India, do not permit the entry of women, at least partially.

In the year 1995, UNESCO celebrated the 25th anniversary of its Man and Biosphere initiative at Seville in Spain. The outcome of this event is the Seville Strategy for Biosphere Reserves. Of the salient features, what is currently relevant are the objectives of the Seville Strategy that emphasize the need to conserve cultural biodiversity, integrate biosphere reserves into conservation planning, secure the support and involvement of local people and improve the knowledge of interactions between humans and the biosphere. At least 10 landscapes spread across India are today declared biosphere reserves. India's first biosphere reserve was established in 1986. What lessons have we learnt from the country's biosphere reserves? It is a little disappointing that not once in the book has the concept and relevance of biosphere reserves in participatory management of biological resources been mentioned.

Finally, while the agenda proposed for nurturing biodiversity in India does at a glance seem the best, implementing it is not as easy as the milk co-operatives in Gujarat for instance. For, while, thanks to advancements in dairy technology and veterinary science, sustainable management of a very basic biological resource as that of milk and the producer of that resource, the cow, is possible, we know too little of the functioning of more complex biological systems to be able to sustainably manage them. Sustainable management of biodiversity will be most effective only when the rural people and the scientists work together. The book has shown us a pathway for bringing in the former.

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