provided here into their nature is rare. Zewail's mastery of presenting things with picture and illustration is evident all through book and is something to emulate. The basic message which Zewail seems to be offering to the reader, especially those from the developing and under-developed countries, is that if one is prepared to work hard and be dedicated, it is still possible to make wonderful discoveries. There seems to be one flaw in the logic though. Many of the experiments would not have been possible in any other place than in an affluent American university, which Zewail himself points out.

The book contains many nice photographs, spreading over the entire life of the much-honoured scientist. These are not only pictures of his parents and his other family members, but also of many famous scientists of our time, like Linus Pauling, Dick Bernstein, George Porter, to name a few.

On the whole, this is an enjoyable autobiography. One is spared from the egoism that often marks the autobiography of successful people. It will be nice if an Indian edition could be published so that the price is within the reach of Indian students for whom I would strongly recommend the book. In fact, the entire science community stands to gain if more such autobiographies are available.

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A Basic Course in Crystallography. J. A. K. Tareen and T. R. N. Kutty. 2001. vol. 1. 205 pp. Price: Rs 230.

Fundamentals of Crystal Chemistry. T. R. N. Kutty and J. A. K. Tareen. University Press (India) Limited, 3-5-819 Hyderguda, Hyderabad 500 029. 2001. vol. 2. 84 pp. Price: Rs 105.

These books are essentially lecture courses in crystallography, intended to cater to textbook needs of students in various interdisciplinary areas at the postgraduate levels. Accordingly, a simple and logical development of the basics of the subject, not commonly available in most textbooks of this kind, is presented in the first volume. The external and internal symmetry aspects of crystals are covered well, with lucid enumeration of the 32 point groups and 230 space groups. The symmetry descriptions essentially follow the International Tables of X-ray Crystallography, but strangely their reference is not included in the bibliography. The description of various crystal forms and habits as also the methods of symmetry projections and pole figures are presented well and should be useful to students of mineralogy, metallurgy, etc.

The crystallographic methods and techniques presented, however, are quite antiquated, as the presentation is restricted to the old classical methods and photographic methods only. It would have greatly benefited the students to have a glimpse of the phenomenal advances that have taken place in this field in recent years, since the advent of synchrotron radiation (SR) source. The high brilliance SR storage ring sources now available at several laboratories around the world, coupled with use of sophisticated instruments based on electronic position detectors or image plate systems have revolutionized practically all areas of X-ray crystallography, from powder diffraction to macromolecular crystallography. The presently available sample environments ranging from ambient to extreme conditions of temperature and pressure were not believed possible just a few decades ago. The current advances, apart from eliminating the earlier drudgery associated with crystallographic experiments, have opened up a wide variety of new applications in several areas of biology, chemistry, physics and materials science. Study of macromolecular structures using microcrystal samples, dynamical structure studies at nanosecond timescales, study of solid state reactions and growth of crystals are now carried out with precision and ease. Likewise, recent advances in global optimization methods (using the maximum entropy techniques, etc.) coupled with innovative processing of powder diffraction data are now able to provide high throughput (*ab initio*) crystal structure solutions for medium large (< 100 atoms) organic molecules using powder samples. Further, the use of the Rietveld profile refinement technique on high-resolution powder diffraction patterns can now refine these structures to precisions that were earlier possible only with single crystals. None of these advances are touched upon, even in passing.

Volume 2 is essentially a reproduction of chapter 4 of volume 1, re-emphasizing the basic concepts of inter-atomic forces, chemical bonds and the packing considerations needed to understand solid state chemistry. It includes a few simple examples of commonly encountered structures with good item-wise discussions. Inclusion of the bond valence concepts and some more examples would have been helpful to build a stronger foundation.

There are quite a few typographic errors some of which are misleading. For example, there are some confusing inconsistencies in Figures 2.28, 2.29 and 2.30; the shortest atomic distances are not indicated properly in Table 4.1 (also in Table 1.1 of vol. 2); 'incoherent scattering' is incorrectly defined on page 138; how does 'theta' become 100.6°, if the sine is calculated as 1.184 on page 143?

In conclusion, while seeking 'to present a comprehensive basic course in crystallography to Indian students', the books fail to enthuse them by not attempting to give a glimpse of any of the state-of-the-art advances that have taken place to revolutionize this exciting field of crystallography in recent years.

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Sustainable Human Ecology. H. D. Kumar. Affiliated East-West Press Pvt Ltd, 105 Nirmal Tower, 26 Barakhamba Road, New Delhi 110 001. 2001. 307 pp. Price: Rs 195.

The author in his Preface suggests that this book is a modest attempt to collage and summarize on his part, a variety of views of 'enlightened and discerning people', who have written on a variety of issues in this multidisciplinary area.

Indeed, the book attempts to cover a whole range of issues – historical ecology, many ecological concerns of today, population, resource consumption, agriculture and food security, land use dynamics, transportation, resource management, etc. of current environmental concern; as well as economic and social issues of interest towards what the author calls as 'human-scale development'(?). In doing this, he claims that the book is directed towards a whole variety of audiences – students/researchers in biology, botany (?), ecology, economics, forestry, geography, geology, oceanography, sociology, climatology, demography, limnology, and above all, the lay public!

The author has attempted this huge task through a set of 10 chapters, starting with one set of three chapters – 'Population and resource consumption, History of human ecology', and 'Environmental concerns'. The next set of chapters deals with 'Food, nutrition and agriculture', 'Transportation and mobility', 'Resource management' and 'Land use and cover change'. The last three deal with economic, social and human-scale (?) issues of sustainability/development. In putting together these sets of 10 chapters, the author has brought together a variety of information, from different sources.

Having said this, I found it extremely difficult to read through this book, let alone follow the message that comes out from each of the chapters individually, and the 'big picture' that comes out of the book as a whole. This is largely because of the absence of a theme that is developed, or attempted to develop through a sequential thematic approach to the issues discussed. To be more specific:

(i) In the first place, the chapters are poorly sequenced. I would have assumed that the history of human ecology (Chapter 2) is the obvious starting point, followed by chapter 3. Chapters 1, 7, 4 and 6 in that order, I see as dealing with natural resources and their management. Chapter 5 being a topic which stands on its own (transportation issues) could then have come, followed by the last three chapters – 9, 8 and 10 in that order.

(ii) Many of the chapter contents represent a set of disjointed writing. To cite a couple of examples: Chapter 2 has the following sub-titles ranging from science and technology through human ecology in Ladakh, and a whole variety of disconnected issues placed in between. The sub-titles and the way they are presented in chapter 3, is another example of this disconnected discourse. At the end, one is left wondering about the ultimate message that comes out of each one of these chapters.

(iii) Often, given a sub-title, the contents do not reflect the topic under discussion. To cite only a few random instances: (Chapter 2 – 'Science and culture', has little discussed on culture; Chapter 4 – what is discussed under 'Agricultural sustainability' has little to say in this emerging area of studies; Chapter 6 – 'Rangelands and sustainable livelihood', deals with statements, without saying anything worthwhile on the topic under discussion.

(iv) The book has many illustrations that are quoted from others and some possibly constructed by the author himself. I was particularly concerned about the latter. A few examples that caught my attention: (a) Figure 7.5 is a poor representation of a village ecosystem where the humans and land use-based and human-managed ecosystems/sub-systems such as agriculture, animal husbandry and domestic system should have been put up-front, with other natural ecosystems such as forests, grasslands, etc. all forming an interactive unit (unlike what is presented), within and outside the village boundary; (b) Similarly, I find it difficult what to make out of Figure 3.5, which is a simplistic view of highly complex issues; (c) Figure 6.11 placed in the context of 6.12, is very confusing. While grasslands in the temperate world could be climax formations, they are often qualitatively different in the tropical world – representing a product of disturbances. These two illustrations are placed out of context.

(v) A few minor issues: (a) There is much repetitive writing which could have been avoided through better organization of the subject matter and trying to evolve the 'big picture' in a more systematic manner. (b) To cite only one example of lack of coherence in presentation of issues – sustainable development as a paradigm comes up in all the chapters, and yet a lay person's definition of it pops up much later – 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' – on page 155 in chapter 6!

To sum up, dealing with linkages between natural and social sciences is indeed a difficult task, even for the few experienced scientists working in this emerging interphase area. If the book is an attempt to address the audience in a developing country like India, it has little to say about it, though there is much out there in the literature in the form of scientific analysis and non-governmental organization-based participatory developmental initiatives, which remain ignored. A treatment of the subject of the kind that is attempted here is not likely to be very helpful to those audiences who are targeted. In the ultimate analysis, the concept of sustainability/sustainable development implies a series of compromises; though it has strong ecological implications, it cannot be used to qualify ecology!

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