

by the older generation of physicists, he is said to have replied that they would never be able to accept it; they would just have die off and the younger generation, brought up with the new ideas, would absorb them without any difficulty.

Crowe's book is not without flaws, but they are too minor to warrant listing here. Whether you wish to learn some history, or you wish to learn how science develops or if you just want to have a few good laughs, the book is an excellent read. The charm lies in the fact that science is an intensely human activity, with all the attendant drama, humour and pathos. I strongly recommend this book.

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Photosynthesis in Algae. Anthony Larkum, Susan E. Douglas, John A. Raven, eds. Kluwer Academic Publishers, Dordrecht, The Netherlands. **Advances in Photosynthesis and Respiration.** Govindjee Series Editor. University of Illinois, Urbana-Champaign, USA. Vol. 14. 500 pp. 2004. Hardbound. ISBN 0-7923-6333-7. November, 2003. Price: 255 US Dollars/232.00 Euros/160.00 British Pounds.

In most Indian universities, the undergraduate (B Sc) and postgraduate (M Sc) courses in botany and plant sciences include algae as a subject. Nowadays, the programmes in life sciences, biotechnology and microbiology also include algae as a major subject. Further, in many universities, phycology is taught as a specialization. However, the course structures on algae in these programmes are mostly limited to discussion on a bit of morphology, systematics and life cycles of some selected algae. The algal physiology, biochemistry, the economic resource aspects and ecology of this important group of plants are rarely discussed. This is largely because of lack of good textbooks on algal biology and biotechnology. If one searches for the new books – both text and reference types, *Photosynthesis in Algae* is a forceful book on this exciting topic.

The first introductory chapter written by the three editors tells about origin and discovery of algae, their diverse photo-

synthetic mechanisms. It discusses various groups of algae like green, red, brown chromophytes, euglenas and chloroachinophytes, and the algal genomes. It also points to rich algal bioresources and one can understand the importance of algae in biotechnological industries. The phylogenetic tree of major plant taxa is instructive. The nature of endosymbiotic origin of algal plastids, fine structure of algal plastids, the route of chlorophyll (Chl) *a/b* binding protein and pigments, chlorophyll *c* as well as appearance of thylakoids in different groups make interesting reading in next chapter.

Prochloron, prochlorothrix and prochlorococcus represent unique type of Chl *a/b* protein-containing oxyphoto prokaryotes. Like cyanobacteria (blue bacteria), these oxyphotobacteria are photosynthetic prokaryotes, but contain Chl *b*. These organisms have unique nature of light harvesting pigment organization and photosynthetic apparatus. They exhibit unusual dynamics of short-term state shifts mechanism as well as long-term acclimation. Molecular phylogeny of chl *b* containing oxyphotobacteria is presented in the third chapter. We owe to algae our current understanding of photosynthesis, the discovery of the prochloron type green oxyphotobacteria. Unicellular algae like *Chlorella*, *Scenedesmus* and *Porphyridium* and cyanobacterium *Anacystis* (*Synechocystis*) have been extensively used for photosynthesis research – both in the investigations of light reactions and of carbon assimilation reactions. These algae were and still are uniquely suitable for biochemical and biophysical studies, and data generated by using these algae led to the foundation of our current knowledge on photosynthesis. Of course, the use of isolated chloroplasts and thylakoids proved valuable for exploring the intricacies of photosynthetic electron flow and related redox reactions. I recall that, in the late 1960s, hand-drawn pictures of damsels by Fred Cho who did his PhD with Govindjee, were pasted on the walls near Eugene Rabinowitch's office. These pictures were that of *Anacystis*, *Chlorella* and *Porphyridium*. Such was the influence of algae on photosynthesis research in the bygone era (!!!). Thus the book under review is an important book in current AIPH series.

The book contains 19 chapters, contributed by 25 experts besides the three editors. These chapters deal with the following five major aspects: general structure, molecular genetics, biochemistry–physio-

I ought to also add that the invention of quaternions must be regarded as a most remarkable feat of human ingenuity. Vector analysis, without quaternions, could have been found by any mathematician by carefully examining the mechanics of the Cartesian mathematics; but to find out quaternions required genius.' This was, of course, tongue in cheek.

Many readers may be surprised to learn that the leading British physicist of the time, Lord Kelvin, and the leading mathematician, Arthur Cayley, were both opposed to the development and use of vector analysis. The fact, however, is that science, or rather the scientific establishment, is conservative and usually opposed to any serious change. When Planck was once asked when the new physics would be accepted