REVIEWS AND ANNOUNCEMENTS

Annual Reviews of Physical Chemistry. Vol. 31, Edited by B. S. Rabinovitch. (Annual Reviews, Inc., Palo Alto, California), 1980. Pp. 675. Price $ 20.00 and $ 21.00.

This volume starts with a fine account of the development of NMR spectroscopy by Jonas and Gutowsky who appropriately have titled their article "NMR in chemistry—An evergreen". It is enjoyable to read this bird's eye view of the major advances in this remarkable field. There are five reviews related to spectroscopy and the areas covered are reflection spectroscopy of organic solids (by Philpott), laser spectroscopy of cold gas molecules (by Levy), molecular vibration of polymers (by Fanioni), saturation transfer spectroscopy (Hyde and Thomas) and Two-photon molecular electronic spectroscopy (Friedrich and Mc-Clain). In the area of reactions, collisions and related areas, there are articles on bimolecular reactions of vibrationally excited molecules (Kneba and Wolfrum), two-body interaction energies (Scoles), inelastic and reactive processes at surfaces (Tully) and reactive molecular collisions (Walker and Light). Albery has written an article on the Marcus relation as applied to reactions in solution while kinetics of high temperature combustion are examined by Gardiner and Olson. Phase transitions in physisorbed monomolecular layer films are reviewed by Vilches and lipid bilayers by Nagle. Other interesting articles are on simulation of protein dynamics (McCammon and Karplus), simulations of freezing and supercooled liquids (Frenkel and McTague), light scattering by molecular liquids (Kivelson and Madden), and surface diffusion (Ehrlich and Stolt).

There are timely status reports on two important topics, the Avogadro constant by Deslattes and the minimum entropy production principle by Jaynes. The new results on the Avogadro constant by XRCD and possible future studies are both valuable while the historical aspect reviewed by Deslattes makes interesting reading. Jaynes finds the outlook for the minimum entropy production principle to be good, but it is not clear whether the basic principles can be reduced to simple rules useful in practice.

All the articles in this volume are useful and informative. Some are exciting and futuristic. A few of the articles relate to narrow areas of specialization while others deal with broad areas. The coverage in all the articles is, however, competent and up-to-date. I strongly recommend the volume to all physical chemists and chemical physicists, although the volume is directed more to the latter. Every library should have this volume to ensure up-to-date knowledge of practitioners in emerging areas.

Solid State and Structural Chemistry, C. N. R. Rao.
Indian Institute of Science,
Bangalore 560 012.

Annual Review of Neuroscience (Vol. 4), Eds.: W. M. Cowan, Z. W. Hall and E. R. Kandel. (Annual Reviews, Inc., Palo Alto, California, USA), 1981. Pp. 556. Price: $ 21.

The Volume contains 15 highly informative reviews covering a range of interesting subjects from the voltage-dependent calcium channel of nerve membrane to the biology of sleep and implications of consciousness.

The prefatory chapter has been contributed by Roger Sperry on the issue that concerns all—"Relation of mind to matter and to brain mechanisms". Sperry says that "Phenomena of conscious experience are conceived to play an active, directive role in shaping the pattern of cerebral excitation." He argues that "science and religion have to be fused." Science will have to take a "mentalistic, hollistic and subjectivist" stance, in contrast to the hitherto known "mechanistic, deterministic and reductionistic" approach. Subjectivity and consciousness are the "man's best channels for gaining an intimate understanding of and a rapport with those forces that control the universe and created man". (The Nobel Prize has been conferred on Sperry in October 1981).

The development of neuro-muscular synapse has been reviewed by M. J. Dennis. The differentiation of mesenchymal cells into myoblasts and then into muscle fibres occurs after the arrival of motor nerve terminals into the site. The basal lamina which is a molecular layer scaffolding the muscle fibre provides instructional signals to the nerve and muscle fibres in the formation of synapse. The review of D. B. Drachman on Myasthenia gravis shows that acetylcholine receptors at the nerve-muscle synapse can be severely reduced in numbers due to auto-immune disturbance.

The review of Aguayo and others conveys that the axon determines the locations of myelination. The density of sodium channels is high at nodes and low at internodes; 10,000/μm^2 and 25/μm^2 respectively.

This high density of sodium channels is lost when the axon is demyelinated. At paranodal regions, the axoglial junctions are septate gap channels, suggesting an intimate function. Hagiwara's detailed review on voltage-dependent calcium channel is concerned with the differentiating the calcium channel from the sodium channel by measuring the changes in regenerative responses and in the overshoot of spike potential caused by changes in external calcium, and by other tests.

The remaining reviews are on the subtypes of beta adrenergic receptors, on the cytoskeletal elements of neurons, on the enteric nervous system, on the issue of genetic and environmental effects on the nervous system, on the evolution of non-mammalian telencephalon, on synaptic plasticity, on vestibulo-ocular reflex, on oculomotor system, and on sleep physiology and its disorders.

Department of Neurophysiology, T. DESIRAJU.
National Institute of Mental Health
and Neuro Sciences,
Bangalore 560 029.

Susruta Samhita (A Scientific Synopsis). By Priyadaranjan Ray, Hirendranath Gupta and Mira Roy. (Indian National Science Academy, Bahadur Zafar Marg, New Delhi ; Under the auspices of National Commission for the Compilation of History of Sciences in India). Pp, 454. Price : Rs. 108, $ 36.00.

The authors have rearranged the textual matter of *Susruta Samhita* on topic-wise in English as required by the present day scholars who are interested in knowing what Ayurveda has contributed to our civilization. The book is divided into two parts. The first part comprises concepts and theoreis, anatomy and physiology, food and drinks, health and hygiene, diseases with treatment, pharmacology, classification of plants and animals, and comprehensive account of surgery. The second part consists of the most salient materials in a tabular form for ready reference and rapid survey.

The arrangement of sections is quite systematic and each topic carries reference to the original classics. The authors have devoted much attention to the study of authoritative commentaries of different ages. Bibliography and index add to the value of the work. Technical words are rendered into simple English to make the reader understand the classical terms, as close to the ancient concept as possible. For instance, to explain vayu in modern terms, is not so simple as air or a nerve impulse. The eight branches of Ayurveda are explained lucidly for the use of historians, scientists, teachers and research workers. The present book is indispensable for frequent reference to one and all in the field.

Member, Central Council of Indian Medicine and Ayurvedic Committee, New Delhi, Shankarapuram, Bangalore 560 004. Y. PARTHANARAYANA PANDIT.

AND

(Retd.) Prof. of Ayurveda, 48, Gandhi Bazar, Bangalore 560 004. M. MAHADEVA SASTRY.

Science Review (Vol. I). (Indian Science News Association, Calcutta). Pp. 103. Price Rs. 10.

According to the publishers, "This is the first number of a series of publications which will attempt to give the general reader an inkling of what is going in the world of Science and Technology". A good idea indeed, especially considering the enormous progress made in recent times. There are magazines such as the *Scientific American* or *New Scientist* from abroad and a few others like *Seience Today* published in India also to serve these purposes. The intention of Indian Science News Association is laudable, nevertheless. It is not clear however, to whom this format is meant or whom the publishers called the general reader. In appearance and get up, the first volume is like a high school science text-book. The contents of this volume being so varied, have helped me judge how an expert, fairly educated or totally strange person would react to a publication of this sort. The first Chapter on 'Genes and Chromosomes' is an area of my specialization while on 'Lectins', I have heard off and on. "Ion Channeling in Crystalline Solids" is an area I am totally unfamiliar. The Chapter on Genes and Chromosomes by A. K. Sharma contains a good amount of information; it is surprising, however, that no mention is made about the recent discoveries on chromatin structure—the nucleosome structure and how the DNA is wound around the histone octamers, the linker region, the transcriptionally active chromatin, etc. The chromatin reconstitution experiments—where the transcriptional specificities of brain or liver cells have been interchanged using reconstituted chromatin employing nonhistone chromosomal proteins of the different tissues—have not found a place in this article. Also the statement made by Sharma that 'there is no reason to suppose that chromosomes which are packed for transmission through germinal line are identical in all respects with

the chromosomes of the body cells' (page 26, lines 12–15) is misleading. The nuclear transplantation experiments conducted by the noted Oxford Zoologist Gurdon have established the 'totepotency' concept unequivocally. Since I am more familiar in the area of genes and chromosomes, I have examined this Chapter more critically. The Second article, Lectins by Appukuttan and Bacchawat is informative. The publishers have obviously chosen the most appropriate scientists from India as authors for this article. With a background of physics and chemistry like mine (undergraduate level and that too more than 2 decades ago), I found the review on Ion channeling by Ghose and Karmohapatro too technical and not too light a reading.

The publishers' idea of organizing the future volumes around some single theme sounds more interesting. These series of publications might prove to be of use to the high school or junior college science teachers.

Microbiology and Cell Biology Laboratory,
Indian Institute of Science,
Bangalore 560 012.

K. P. GOPINATHAN.

TECHNOLOGY OF ELECTRICAL INSULATION AND HIGH VOLTAGE PULSE TECHNIQUES

Department of Atomic Energy has sponsored a five-day BRNS Workshop-Course on "*Technology of Electrical Insulation and High Voltage Pulse Techniques*" at the BARC., Bombay, during 1–5 March, 1982. The topics include (*a*) *Review* of breakdown mechanisms, partial discharges and epoxy casting techniques, (*b*) *Design* of HVDC supplies, Marx generators, air-cored pulse transformers, transmission lines, spark-gaps, grounding and shielding, transducers and data acquisition, capacitors and capacitor banks and (*c*) *Applications* in metal-forming, flash X-ray radiography and thermonuclear fusion. Persons from industry, teaching institutions and research labs. interested in attending may please write to "convenor, HV Pulse Workshop-Course, Plasma Physics Section, BARC, Bombay 400 085" for details.

SEMINAR ON HEATING SYSTEMS FOR GALVANIZING PLANTS

Indian Lead Zinc Information Centre is organising a Seminar on the above subject at Claridges Hotel, New Delhi, on 30 November and 1 December 1981.

The Seminar reviews the existing furnace designs and methods for measuring temperature and controlling energy input in Indian Galvanizing plants in relation to the developments in these areas in different parts of the World. About 15 technical papers from India and overseas will be presented by experts including the emerging alternative fuels for application in the galvanizing sector. The seminar assumes special significance in view of its strong emphasis on the efficient and economic utilisation of fuels and zinc.

For registration details, please contact:

INDIAN LEAD ZINC INFORMATION CENTRE
B 6/7, Shopping Centre, Safdarjung,
New Delhi 110 029.

HOMI BHABHA AWARD

The Homi Bhabha Memorial Award for 1981 for outstanding research contribution in nuclear medicine has been awarded to Colonel N. Lakshmipathi, Director of the Institute of Nuclear Medicine and Allied Sciences, New Delhi.

The award will be presented on the 13th annual session of the Society of Nuclear Medicine in India. Previous recipients of the award are as follows: Dr. Raja Ramanna, Dr. Vikram Sarabhai and Prof. V. Ramalingaswami.

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