

TABLE I

Frequency of cells in different stages (in per cent) of the total dividing cells

Duration of treatment	Mitotic index	Pro-phase	Scattered metaphase	Meta-phase plate	Ana-phase	Telo-phase/binucleate	Tetra-ploid	Unequal separation/laggards	Multi-polar mitosis	Soma-tic reduction	Chromo-some clumping
1 hour	6.4	39	13.8	11.7	4.7	9.3	17	1.0	3	0.5	..
2 hours	4	56	13.4	2.7	1.4	7	11.9	1.8	2.2	1.4	2.2
3 hours	1.5	47	18	2	2	4	4	1.0	22

Germinating seeds of *Vicia faba* with the roots of about one cm in length were immersed in aqueous solution (0.05%) of chlorflurenol 7301 (Celamerck, 6507 Ingelheim, Germany) at $25 \pm 1^\circ \text{C}$ for 1, 2 and 3 hours durations separately. Treated seeds were thoroughly washed and allowed to grow half dipped in water. After three hours' recovery period in each case, the roots were fixed in Carnoy's solution. Root tips were feulgen squashed for cytological observations. In all cases, the count determinations were based on approximately 500 dividing cells.

Chlorflurenol inhibits mitosis and arrests the dividing cells at metaphase causing scattering of metaphase chromosomes. However, it allows a certain percentage of cells to proceed further like colchicine² resulting in tetraploidy and binucleate cells followed by failure of cytokinesis. Of the various abnormalities induced by the treatment involves unequal anaphase separation, lagging chromosomes, multipolar mitosis, somatic reduction, chromosome clumping, etc. The cells showing anaphase separation of chromosomes without kinetochore separation and bipartitioning into chromatids (*i.e.*, somatic reduction³), suggest that

chlorflurenol interferes with glycolytic enzymes and thus inhibits the cleavage of kinetochore, similar to the glycolytic inhibitors (*e.g.*, iodoacetic acid, iodoacetamide)⁴. Preliminary studies using other plants *e.g.*, *Allium cepa*, *Hordeum vulgare* show that chlorflurenol may be used as a pretreating agent in chromosome work. Results are documented in Table I.

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1. Sankhla, N., Bohra, S. P., Vyas, S. P. and Sankhla, D., In H. Y. Mohan Ram, J. J. Shah and C. K. Shah, (eds.), *Form, Structure and Function in Plants*, Sarita Prakashan, Meerut, 1975, p. 255.
2. Sharma, A. K. and Ghosh, S., *Acta Bio. Acad. Sci. Hung.*, 1969, 20, 11.
3. — and Sharma, A., *Chromosome Techniques: Theory and Practice*, Butterworth, London, 1972.
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REVIEWS AND NOTICES OF BOOKS

Annual Review of Astronomy and Astrophysics, Vol. 14. (Edited by Geoffrey R. Burbidge, David Layzer and John G. Phillips. (Annual Reviews, Inc., 4139 El Camino Way, Palo Alto, California 94306, USA), 1976. Pp. 500. Price: U.S.A. \$ 17.00, Elsewhere: \$ 17.50).

In these days of rapid growth in various branches of theoretical and observational astronomy, there is every need for comprehensive review articles to keep the knowledge of the practising astronomer up-to-date. The series of *Annual Review of Astronomy and*

Astrophysics are filling such a need admirably since their inception and the present volume is no exception.

The fourteenth volume contains 17 articles covering a wide spectrum. Two articles deal with instrumentation — Echelle spectroscopy with emphasis on its astronomical applications and the young and rapidly growing field of Radio Astrometry, which has applications in Geodesy besides dynamical astronomy. Three articles are concerned with solar system studies — Chemical composition of solar primitive material, physical processes in comets, and orbital resonances

of satellites. Four more are devoted to stars — stellar opacity, the structure of cataclysmic variables and nonradial oscillations.

The interstellar medium is dealt with in two articles, one on magnetic fields, and the other on hydrogen line studies. There are two articles on other aspects of the galaxy — one on its chemical evolution and the other on galactic soft X-ray sources.

The last five articles cover the fields of extragalactic sources and cosmology. They deal with line emission from quasi-stellar sources, radio emission from spiral galaxies and extended extragalactic radio sources, radio and optical properties of BL Lacertae objects and observational tests of antimatter cosmologies.

Like most of the preceding volumes in this series, the present one is a must for any library catering to astronomers or astrophysicists.

CH. V. SASTRY.

A Text Book of Geology. By S. K. Chadda. (Kapoor Brothers, Jammu-Srinagar, Kashmir), 1976. Pp. viii + 300. Price: Rs. 15.60.

The book is a welcome addition to a few books on Geology written recently by Indian authors. The book has 28 chapters covering probably the syllabus of degree colleges in Jammu-Srinagar area. The titles of some chapters do not sound well (Ex. :- Water working under the ground). There is a chapter on soils in general and on the soils of India, though brief in coverage. Some chapters have the heading, "Study of.....". There is no consistency in giving proper titles to the various chapters. Chapter dealing with 'Stratigraphy' covers 'geological record of India' which is not complete as it ends with the Upper Gondwana System. This is one of the serious drawbacks of the book. An index at the end has contributed something to the value of the book. At the end of each chapter is given a set of 'typical questions' to probably justify the book being a 'text book'. The material or quantum of information given to serve the interests of those studying Civil Engineering and Technology is not sufficient. The author's attempt to give some illustrations from the Indian region is laudable, though mainly all of them are poor in quality and many more illustrations could have been selected from the Indian region to replace those from other countries. The book has a clear

imprint of "notes book" with plenty of awkward expressions. A language expert would have been of great use to improve the language of this book. The price of the book is quite reasonable. The book would become more useful if improvements are attempted in the next edition.

S. SAMBE GOWDA.

Selected Topics in Environmental Biology. Editors: B. Bhatia, G. S. Chinna and Baldev Singh. (Published by Interprint Publications, New Delhi), 1975. Pp. 529 + xiy. Price: Rs. 300.

In the recent years, there has been intensification of activities in many countries on the studies relating to interactions between man and his environment. This is due not only to the urge to prevent human suffering and disease and to maximise human output, but also to expand the limits of habitable regions necessitated by the pressure of rapidly increasing population.

Environmental biology has been rightly considered to be of sufficient interest for a discussion by the International Congress of Physiological Sciences.

The present volume is based on the Symposia and the papers presented at the XXVI International Congress of Physiological Sciences held at New Delhi, October 20-26, 1974. The papers presented in the volume demonstrate world wide interest and effort in research related to environmental biology and the wide gaps in our knowledge of the subject.

Symposia were arranged on the subjects of high altitude physiology, underwater physiology, physiological effects of cold, physiological effects of heat and physical and physiological effects of accelerations. The other topics discussed have been classified and presented under the following sections: Thermoregulation, Cold stress, Heat stress, Hypothermia and Thermal injury, Adaptation to stress and physical work, Prolonged exposure and short term exposure to hypoxia, Pulmonary oedema, Constitution and body function in different ethnic groups, Speed acceleration and gravity, Environmental pollution, Noise, Hyperbaric and Emotional stress and Cyclic variations in body functions.

This volume is certainly a valuable reference book for those concerned with the quality of environment and the effect of stress on human health.

M. SIRSI