

obtained as light yellow needles from acetic acid. Reaction of the bromo compound with boiling pyridine afforded the unknown 5-hydroxy-6-benzoyl flavone (III) as colourless needles, m.p. 167–68°. The flavone (III) was also synthesised by the Kostanecki-Robinson benzoylation of 2-acetyl-4-benzoyl resorcinol followed by subsequent treatment with concentrated H₂SO₄.

All the compounds gave satisfactory analysis for C and H.

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Efficacy of Colchicine from the New Indian Source

Colchicine has been so long commercially extracted from the corms and seeds of *Colchicum autumnale*, *C. luteum* and *Merendera* species. Recently a new source has been found in the different members of *Iphigenia* (Liliaceae). The highest yield of colchicine so far recorded is from *Iphigenia stellata* (1.2 to 1.9%)^{1,2}, whereas the former species of Liliaceae yield 0.5 to 0.21% only³.

Colchicine extracted from the new source has been applied on *Allium cepa* to test its efficacy as polyploi-

dizing agent. The results are very promising. Cytological effects like metaphase arrest, different degree of polyploidy, multipolarity, diplochromatids, etc., are very predominant with all the three concentrations applied. The concentrations used are 0.01, 0.1 and 0.5% respectively.

The results have been compared with similar concentrations prepared from E. Merck sample. Tumours were induced on the root tips after 24 hours of treatment (0.01%). The divisional frequency with the above concentration from the new colchicine ranges from 8–30% whereas with that of E. Merck colchicine, the frequency is 1–23%.

The small stock of colchicine used in this experiment was obtained through courtesy of Dr. R. S. Rao, Deputy Director, Central National Herbarium, Botanical Survey of India.

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A. K. SARKAR.

1. Kapadia, V. H., Sukh Dev, Rao, R. S. and Ansari, M. Y., *Phytochemistry*, 1972, **11**, 1193.
2. Ansari, M. Y. and Rolla, S. Rao, *Bull. Bot. Surv. India*, 1976, **15**, 118.
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REVIEWS AND NOTICES OF BOOKS

Matrices and Tensors in Physics. By. A. W. Joshi. (Wiley Eastern Ltd., New Delhi), 1975. Pp. x + 250. Price Rs. 15-00.

This is a good book, welcome to the stock of texts to be used by the physics students at the University B.Sc. and M.Sc. level. The subject of matrices appears first in connection with the solution of simultaneous algebraic equations and then permeates into other areas especially quantum mechanics. Tensors, restricted to cartesian tensors, are applicable at an intermediate level to a number of areas in elasticity, crystal physics and so on, whereas the full blast of tensor analysis becomes indispensable when dealing with general relativity. The book makes a sincere attempt to introduce these two topics for the students and should succeed in its task.

The coverage of the topics is fairly conventional. On the first topic, one starts with the algebra of matrices, special types of matrices, solutions of

simultaneous equations, diagonalization and eigenvalue-eigenvector problems and finally deals with functions of matrices. On the second topic one starts with the definition and algebra of tensors, the metric tensor, tensor calculus and Christoffel symbols and goes to a discussion of the curvature tensor.

What distinguishes the book is the presence of about 100 worked examples and about 200 problems with partial answers, selected from different areas of physics. This should drive home the point that the subject is not an isolated study but is applicable to many areas of physics. The book bears the mark of having been taught earlier to groups of students. In a sense it is a tested product which can be recommended. The book, published with a subsidy from the National Book Trust, is also moderately priced at Rs. 15/- and deserves to be popular among the students.

E. S. R. GOPAL.

Drought and Agriculture. By C. E. Hounam, J. J. Burgos, M. S. Kalik, W. C. Palmer and J. Rodda. (Technical Note No. 138, published by the World Meteorological Organization, Geneva, Switzerland), 1955. Pp. i to xv + 127. Price not given.

This is the report of the working group on the assessment of drought which was set up by the World Meteorological Organization with Mr. C. E. Hounam as the Chairman and Messrs. J. J. Burgos, M. S. Kalik, W. C. Palmer and J. Rodda as Members.

This technical note gives a systematic analysis of the drought problem from the agricultural point of view. The various definitions of drought classified according to the criteria such as rainfall, rainfall with mean temperature, soil water and crop parameters, climatic indices and estimates of evaporation, and other general definitions have been given. The different meteorological indices of agricultural drought, methods of analysis of the rainfall data and water balance equations developed by the use of climatic parameters have been explained in detail. Nature of drought injury to plants, structure and mechanical features of plants in relation to drought resistance, the behaviour of plant communities as in pastures and the effect of drought on livestock and water requirements in general are also presented.

Drought conditions lead to direct losses from reduced crop yields, pasture deterioration and at times death of livestock. There are number of indirect losses affecting the socio-economic conditions of the people. As such understanding the drought and planning to mitigate the drought effects become necessary. This technical note which contains the recent research work can be made use of for planning development of drought-prone areas. This publication is greatly useful to the research workers and for those involved in agricultural planning.

G. V. HAVANAGI.

Mulching Effects on Plant Climate and Yield.

By J. W. Davies. (Technical Note No. 136, published by the Secretariat of the World Meteorological Organization, Geneva, Switzerland), 1975. Pp. i to xi + 92. Price not given.

The Commission for Agricultural Meteorology set up by the World Meteorological Organization discussed the topic of importance of mulches on the successful production of crops at the Fifth Session of the Commission held in 1971 and Mr. J. W. Davies was the rapporteur on Meteorological Effects of soil cover. This publication contains the report.

The review of published papers between 1954 to 1970 concerning the effect of mulches on crop yields and micro climate of the soil are included. Effects of mulches on temperature, soil moisture, erosion and soil physics, pests and diseases, growth and yield of crops and weed suppression are the major topics presented. Each part is subdivided into no specific crop, temperate fruit trees, temperate soft fruits, vegetable and flowers, forestry, grasses and cereals and tropical and sub-tropical crops. Effect of the organic and inorganic mulches are reviewed separately and mixed mulch comparisons are also made wherever needed.

Mulching or covering of the soil surface with organic or inorganic mulches help in decreasing the loss of soil moisture due to evaporation, reducing the soil temperature fluctuations and protecting the soil from the impact of rain thereby minimising the soil loss due to erosion. The mulches can be used advantageously for the cash crops or fruit trees wherever they are grown under limited rainfall or irrigation water.

This publication is very useful as a reference book for workers in agriculture involved in research on the efficient use of soil moisture.

G. V. HAVANAGI.

ANNOUNCEMENTS

Award of Research Degrees

Karnatak University, Dharwar, has awarded the Ph.D. degree in Physics to Shri Patil Ranganagoud Laxmanagoud; Ph.D. degree in Chemistry to Shri Narke Chandrashekhara Sharanappa; Ph.D. degree in Botany to Shri Sadanand Nagesh Hegde.

M.S. University of Baroda has awarded the Ph.D. degree in Chemistry to Kumari Jasoda Hariram Pardani; Ph.D. degree in Biochemistry to Shri Hira Lal Nakhasi; Ph.D. degree in Zoology to Shri Pratap Lalsing Yadav; Ph.D. degree in Microbiology to Shri Ashutosh Nilkanthrai Kachhy and Kumari Salma Mohammed Amin Baqui; Ph.D. degree in Physics to Shri Arvindkumar Raman Vyas.

Osmania University, Hyderabad, has awarded the Ph.D. degree in Biochemistry to Shri S. Bapu Rao; Ph.D. degree in Chemistry to Shri Satyanarayana Murthy; Ph.D. degree in Physics to Shri Narasimhaacharyulu; Ph.D. degree in Genetics to Smt. L. Geetha.

Sri Venkateswara University, Tirupati, has awarded the Ph.D. degrees in Botany to Shri T. Haragopal; to Shri M. Narasimha Reddy; and to Shrimathi M. Santha Kumari; Ph.D. degree in Physics to Shri N. Manohara Murthy.