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Punjabrao Krishi Vidyapeeth,
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A Preliminary Note on the Free amino Acids in *Centella asiatica* Linn.

Centella asiatica Linn. Urban Syn., *Hydrocotyle asiatica* Linn. (Umbelliferae) is a prostrate perennial, mildly aromatic herb found throughout India. This plant is widely used in Indian systems of medicine^{1,2}. The present study is aimed at the detection and distribution of the free amino acids present in the different regions of the plant. The presence of five amino acids in this plant has been reported earlier.³

The plants for investigation were collected around Tiruchy town and separated into leaves, petioles, stolons and roots. A known quantity of each part was stabilized in 80% ethyl alcohol and the amino acid fraction extracted and identified by two-dimensional descending paper chromatography⁴.

Twenty free amino acids were identified in all the four different regions of the plant. They are : cysteine, aspartic acid, glutamic acid, serine, glycine, threonine, alanine, arginine, lysine, histidine, tyrosine, amino-butyric acid, valine, methionine, proline, isoleucine, leucine, phenylalanine and tryptophan.

A colorimetric comparison of the quantity of the amino acids present in the different regions of the plant was made on the basis of the intensity on ninhydrin colour spot. It was found that the distribution of free amino acids in the leaves, petioles and stolons was about the same. In these regions glutamic acid, serine and alanine were found in larger quantities than the other amino acids. In the root, the various amino acids were found in greater quantities than in the other parts ; and in particular, aspartic acid, glutamic acid, serine, threonine, alanine, lysine, histidine and amino-butyric acid were in abundance.

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Tiruchirappalli-620002, June 10, 1975.

1. *The Wealth of India : Raw Materials*, C.S.I.R., Delhi, 1950, 2, 116.
2. Chopra, R. N., Nayar, S. L., Chopra, I. C., *Glossary of Indian Medicinal Plants*, C.S.I.R., New Delhi, 1956, p. 58.
3. Malhotra, C. L., Das, P. K., Sastry, M. S. and Dhatta, N. S., "Chemical and Pharmacological studies on *Hydrocotyle asiatica*," *Indian J. Pharm.*, 1961, 23, 106.
4. Gnanarethnam, J. L., Contribution a l'etude de quelques aspects biochimiques et physiologiques des plantes intoxiquees par la simazine, *Ph.D. Thesis*, University of Paris, France. 1968, p. 18.

REVIEWS AND NOTICES OF BOOKS

World Meteorological Organization. Technical Note No. 131. *Climate under Glass*. By Dr. J. Seemann. 1974. Pp. 40. Price not given.

Dr. J. Seemann has rendered a great service to agricultural scientists interested in raising tropical or sub-tropical crops in temperate or frigid zones under the suitably controlled environment of a glass-house. He has presented in this brochure a critical digest of several experiments in glass-houses already carried out under European conditions by workers in this area.

Stressing that solar radiation is a major factor the author emphasises that in northern latitudes, the diffuse sky radiation can at times compete with the contribution from direct solar radiation. The glass or other plastic material enclosing the glass-house cuts off the ultra-violet and allows only a part of the solar energy to be transmitted into the interior of the glass-house. The blanketing effect of the glass or plastic covering as well as the energy balance at

the soil surface within the glass-house irradiated by solar radiations that reach that surface are greatly responsible for making the "climate under the glass" so much warmer than outside.

The author develops the subject under two main headings, viz., Chapter 1: "Elements and factors of climate in the greenhouse" and Chapter 2: "Control of climate in the greenhouse". In Chapter 1, the author discusses the several environmental factors like: (i) Radiation and heat balance, (ii) Heat transformation, (iii) Temperature conditions including air, soil and plant temperatures, (iv) Air humidity, (v) Evaporation and consumption of water and (vi) the Carbon-di-oxide factor. Chapter 2 covers topics like the basis of climatic control, regulation of temperature, shading, ventilation and water atomising installations and short period spraying.

The author has presented a clear picture of the large number of factors controlling the climate within the glass-house which is rendered congenial to the growth

and development of plants which would have no chance of survival under the extreme cold of the open climate. The various interesting points discussed are aptly illustrated by diagrams presenting the results of some of the glass-house investigations already carried out in Europe.

The brochure provides a list of references and bibliography on "Climate under glass".

We warmly recommend this valuable publication of W.M.O. for perusal by our agricultural scientists in India who may wish to utilise these techniques particularly in the northern regions of the country where crops and orchards are exposed to frost hazards in winter.

L. A. RAMDAS.

Coping with Increasing Complexity—Implications of General Semantics and General Systems Theory.

By Donald E. Washburn and Dennis R. Smith. (Gordon and Breach, Science Publishers, New York London, Paris), 1974. Pp. x + 398. Price \$ 12.80.

Apart from the noise factors mathematically explored by information theorists, there is, in human communication, a much more fundamental source of distortion, attributable to the human mind itself and its conditioned 'world view'.

In recent times, starting from the beginning of this century, knowledge (specialized to a large extent) has been increasing at an explosively high rate. This has led to over-specialization and isolation of scientists in different disciplines and to the growth of mutually unintelligible jargons.

It is here the book under review comes to throw some light on the reorientation of the human mind, human attitudes and human linguistic and thinking habits, towards the search for *relations* and 'relations of relations', that is, towards the search for *isomorphism*. Nothing is absolute and permanent. All knowledge is relative.

Man (the observer), the human nervous system and the way in which the human mind psychologically, logically and linguistically dissects and 'maps' reality in terms of the symbols of his description, are all inalienably linked with the confusion of man's interaction with his ecology, ever increasingly becoming complex.

In the book, while the 'General Semanticist' is concerned with the structural similarities of language and the world it attempts to 'map', the 'General Systems Theorist' strives to discover structural similarities in different fields of knowledge. The book (an outgrowth of the joint conference sponsored by the Institute of General Semantics and the Society for General Systems Research) must be read by every educated thinking person, at least to be aware of the

limitations of our knowledge, the limitations of our logic and the limitations of our symbolic communications systems (the 'maps' like natural language (P. C. Ganeshsundaram, "Structural Relativity in Languages," paper presented to the 4th International Congress of Applied Linguistics, AILA, Stuttgart, August, 1975, to be published in the *Journal of the Indian Institute of Science*, Bangalore, in press, mathematical symbolism, etc.) and the limitations imposed by our own nervous system in 'mapping' the 'territory' of the external 'reality', which we can only interpret *relative* to ourselves and never in absolute terms.

Contributions to this book have been made by 28 scholars, some of whom are 'general semanticists' and some 'general systems theorists'.

P. C. GANESHSUNDARAM.

Annual Review of Physiology (Vol. 37), 1975. (Annual Reviews, Inc., Palo Alto, California 94306, U.S.A.). Pp. 558. Price not given.

The main aim of this *Annual Review* has been "to play a distinctive and useful role in providing the reader with a comprehensive survey of research in selected areas of physiology". This has been fairly achieved by the contributions which cover a wide range of topics. "Vestibular mechanisms" deal with the mechanisms of hair cell action and the physiology of the Vestibular end organs. "Electrophysiology of Neuroglia" brings home the conflicting opinions pertaining to the functions of the neuroglia; the properties of receptor units in the Somatosensory system and their Central Nervous System connections, "The Neural control of the pituitary" and 'Structure function relationships in excitable membranes', the extra visual effects of visible and ultra-violet light on humans and other mammals and mechanisms involved in the control of body temperature are presented in various chapters. 'Renal physiology' has been limited to dynamics of glomerular filtration, control of sodium reabsorption and uric acid excretion. Nervous and hormonal control mechanisms of vascular beds of the heart, brain, kidney and other organs is emphasised in the review on 'Regional blood flow'.

Advances in hormone research is dealt with in the reviews on 'Hormonal regulation of the reproductive tract in female mammals', "the regulation of growth by endocrines" "Peripheral actions of glucocorticoids", "Circulating gastrin" and "erythropoietin".

Physiology of respiration covers 'regulation of respiration in man' and 'defense mechanisms of the lungs'.

Of general interest are the topics on "Avian physiology", "Comparative physiology of Suspension feeding" and "The Sodium pump". M. SIRSI.

Grape Varieties in India—Description and Classification. By K. L. Chadha and G. S. Randhawa, (Indian Council of Agricultural Research, New Delhi), 1974. Pp. 221 52 Text-Figures. Price Rs. 10.25.

This is an attempt by the authors to describe the characters of 130 cultivated varieties of grapes in India. Most of these varieties are confined to a few research stations under the Indian Council of Agricultural Research. Nevertheless, the authors have given detailed descriptions of each variety, some of them illustrated with text-figures.

There are four Chapters, I. Introduction, II. Characters Used in Grape Description and Classification, III. Description of Varieties and IV. Classification of Grape Varieties. Chapter I is precise and brief. Chapter II reflects the thorough understanding of this specialized branch by the authors. The characters taken up for description and classification are well described and illustrated. Chapter III is descriptive, though somewhat repetitive, which perhaps could not be avoided in such a treatise. Chapter IV gives the classification of 136 varieties of grapes, with a key for identifying the varieties. A pictorial analysis of the grape varieties is also given.

In India we grow only a limited number of grape varieties. The fact that 130 varieties are available in the research stations in India, for economic exploitation by the farmers is clear from the data given in the book. Considering there are about 7,000 varieties of grapes in the world, this number of 130 is too small. However, at least some of the more promising varieties under Indian conditions should be taken up for wider cultivation. The authors' attempt to bring out the various characters of these varieties would stand credited if our extension workers take the lead from this point. The key for classification of grape varieties given by the authors is rather complicated, though the authors seem to feel that the key is "simple and suitable for rapid and accurate identification of varieties". Considering that several of these characters, particularly the colour of the fruits and of the leaves vary perceptibly under the influence of different climatic factors and the soil and other agronomic factors, including nutritional deficiencies in the soil, some of the characters suggested for classification and identification may not be very accurate. What is applicable to Delhi conditions may not be applicable to Bangalore, or Dindigul condition in all the varieties. Perhaps with additional information collected over a period of years, from different agro-climatic regions of the country, the key may be suitably modified.

The authors' efforts to collect all the available information on grape varieties in India, and present them

in a systematic and meaningful manner are highly commendable. This monograph will be an asset to the research workers and students specialising in grapes. Extension workers and progressive farmers could get rich information on the scope for grape cultivation of a widely varying number of varieties under Indian conditions. The book could be a valuable addition to the libraries in India.

G. RANGASWAMI,

Magnetic Resonance in Chemistry and Biology.

Ed. Janko N. Herak and Kresimir J. Adamic. (Marcel Dekker, Inc., New York), 1975. Pp. ix + 551, Price \$ 34.50.

This book is a collection of articles based on lectures at the Ampere International Summer School on Magnetic Resonance, held in Yugoslavia in 1971. The stated purpose of this book is to 'introduce magnetic resonance to younger scientists working in those natural sciences for which these techniques have proven particularly useful'. The chapters vary widely in their level of sophistication and their usefulness to chemists and biologists. The introductory articles on Spectroscopy (Adamic), NMR (Bovey) and ESR (Bard) may prove useful to the uninitiated. The articles on Applications of Magic Angle Rotation, Study of Molecular Motion in Solids and Spin-Lattice Relaxation in Low Magnetic Fields are perhaps unnecessary for the non-spectroscopist. The chapter on Mathematical Analysis of Distortion Effects in an ESR Spectrometer and the discussion of Signal to Noise Ratio of NMR Oscillator Detectors are of interest only to a small fraction of 'natural scientists', who are instrumentally minded, while the last two chapters dealing with Dielectric Measurements are totally out of place.

Chemically, interesting applications of ESR to kinetic problems and electrochemistry are described and may prove useful. The biologically useful chapters are those dealing with 'Radiation Induced Processes in Nucleic Acids' (Herak), 'Hemoglobin' (Maricic) and the description of Studies of atomic and molecular motions by NMR (Jones). The article on High Resolution NMR of biopolymers is too brief to be of much use to the non-specialist. The book has been published four years after the conference and does in no way accomplish its stated purpose of introducing magnetic resonance to 'natural scientists'. The publication of conference proceedings of this type serves only to enhance the list of publications of the contributing authors. It is time the scientific community took a serious look at the duplication of reviews and papers to prevent our libraries from being drowned in a sea of redundant material.

P. BALARAM,