

In this volume 35 articles which appeared in Annual Reviews of: Biochemistry (7), Biophysics and Bioengineering (9), Neuroscience (1), Pharmacology and Toxicology (6), Physical Chemistry (2), Physiology (9) and Plant Physiology (1) during 1978-80 have been collected and grouped under Excitable membranes, Active Transport, Membrane structure and Chemistry and Receptors. There are ten reviews on excitable membranes covering electrical properties of egg cell membranes, mechanisms of slow synaptic responses, ionic currents and mechanisms of excitation in Molluscan soma and *Paramecium*, effect of Neurotoxins and on the role of cyclic nucleotides. Another ten articles on active transport consisted of the electrogenic  $\text{Na}^+$ ,  $\text{K}^+$  pump in smooth muscle, biochemical mechanism of the sodium pump, transport of sugars, amino acids and  $\text{Na}^+$  cotransport, cellular transport mechanisms and energy coupling for membrane transport in plants. Under membrane structure and chemistry, eleven authoritative articles

on  $\text{Ca}^{2+}$  dependent ATPase of the sarcoplasmic reticulum, membrane ATPases of prokaryotes, NMR studies on membrane structure and dynamics, assembly of proteins in biological membranes, lipid asymmetry in membranes, viral envelopes and plasma membranes and lipid bilayer phase transitions were presented. The remaining four reviews were on the role of lipids in receptor mechanisms, receptors for amino acids, biophysical analysis of receptor function and opiate receptors. Being an excellent collection of exhaustive and critical reviews on many aspects of contemporary interest in biological membranes, this volume would be particularly useful to research workers and for advanced level teaching in the field of membrane biology.

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## SCIENCE NEWS

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### NUTRITION AND THE DEVELOPMENT OF THE CHILD

An international workshop on 'Nutrition and the Development of the Child' was conducted at the Biochemistry Department of the M.S. University, Baroda from 8 to 15 January 1982. This workshop was sponsored by COSTED, UNICEF, UNESCO/IBRO, ICMR and UGC.

The objectives of the workshop were: (1) identification of factors which act as constraints or stimulants for the development of the child, their prevalence and impact; (2) stimulation of further research and social action designed to eradicate the former and explore the latter and (3) creation of an awareness of these factors among people in different walks of life concerned with the child and its development.

The formal sessions of the workshop were preceded by the inaugural sessions on the 8th which marked the silver jubilee celebration of the Biochemistry Department.

In sessions 1 and 2 on 'pregnancy and fetal development' the key points emphasized were the different approaches to and problems in the formulation of nutritional requirements and dietary allowances for pregnancy (Roderuck), the nutritional and biochemical phenomena and anomalies during pregnancy (Rajalakshmi), the potentiality of using selected serum constituents and other parameters such as blood glucose, serum lipids, tocopherols and magnesium, and their value in preventing fetal malnutrition

(Metcoff, Raman and Peramma), pregnancy gains and birth weights (Jansen), the fetoplacental unit (Agarwal) and the pattern of fetal growth retardation with maternal malnutrition (Bhatt).

Session 3 on 'postnatal care and development' was concerned with the nutrition of the pre-term with particular reference to the value of human milk (Gaul), the prenatal maturation of the intestine in relation to infant nutrition (Koldovsky) and the relevance of pre-natal and post-partum practices for maternal and infant nutrition (Jayam).

In session 4 on 'lactation and milk composition', the aspects discussed were milk yield and energy exchange (English), lactation in relation to maternal body build, food intake and infant growth (Kusin), and the special biochemical features of milk and their possible relevance for infant nutrition. These included lactose, nitrogen, protein and taurine, and short chain fatty acids (Gaul), hormones such as ACTH, corticoids, erythropoietin and thyroxine (Koldovsky), immunoglobulins such as IgA, IgG and IgM (Reddy) and lactoferrin,  $\text{C}_3$  macrophages, lymphocytes and other cells (Barrois) and the capacity of human milk to prevent and reduce intestinal putrefactive processes (Haenel and Agarwal).

Session 5 on 'breast-feeding, bottle-feeding and weaning practices' was concerned with the possibility of reversing the increasing trend of bottle-feeding in urban areas by appropriate home-based and

community-based services (Clavano and Johnson), the association of this reversal with reduced infant mortality and morbidity (Clavano), the predictable increase in bottle-feeding with urbanization and the transition back to breast-feeding with adequate support for the mother on the basis of studies carried out in diverse regions (Bertrand and Raphael) and patterns of feeding in specific regions (Thimmayamma and Paneru).

In session 6 on 'the influence of environmental, hormonal and emotional factors in early development' the major aspects discussed were the importance of mother-child interactions (Mundy-Castle), the adverse impact of malnutrition on such interaction probably mediated by apathy (Gunnar) and the importance of normal patterns of such interactions for the capacity of the infant to cope with stress (Levine).

Session 7 on 'nutrition and immunology' was concerned with the impairment of immunoresponses in malnourished children and small babies as judged by a variety of criteria including cutaneous hypersensitivity and blood parameters such as *T. lymphocytes*, thymic hormone activity, antibody production, opsonization and phagocytic activity and the complement system (Chandra) and altered immuno responses to measles and polio vaccine (Sundaravalli).

Session 8 on 'the ecological, physiological, and biochemical correlates of severe malnutrition in children' was concerned with changes in the profiles of malnutrition with an increase in marasmus and a decrease in kwashiorkor associated with the decline of breast-feeding (Omololu, Hijazi and Pratapkumar), regional variations in biochemical profile in relation to clinical category (Pratap Kumar) and abnormalities in skeletal growth (Shah).

Session 9 on "Surveillance of growth and development during childhood" was concerned with the importance of integrated surveillance systems involving somatic measurements, diet patterns, socio-economic conditions and cultural practices and the efforts of the National Nutrition Monitoring Bureau in this direction (Rao), the problems posed by squatter slums and the organisation of action programme in urban areas of Kuala Lumpur (Yusof), the growth status of infants in relation to feeding practices (Kardjati) and differences in the patterns and span of adolescent growth in different groups in relation to age at puberty, body fat, BMR and skeletal growth (Jyoti).

Sessions 10 & 11, concerned with the impact of malnutrition on the CNS, began with comprehensive reviews by Udani (man) and Balazs (animals). Specific aspects discussed included changes with malnutrition on histological features of the sural nerve (Dastur), brain DNA and related enzymes (Subba Rao), oxygen and glucose uptake (Mehta), isoenzymes of GDH, and gray and white matter lipids

with special reference to phosphoinositides (Ramakrishnan), mitochondrial enzymes (Mourek), inhibitory neurotransmitters (Ramanamurthy) and essentially similar alterations in EEG patterns in malnourished animals (Desiraju) and children (Sail). The need for taking full advantage of the plasticity of the CNS as judged by several observations for reversing the effects of malnutrition was emphasized by Balazs.

Session 12 on 'animal models of behaviour' was concerned with the impact of malnutrition on social behaviour as judged by cooperation or aggression (Smart), spatial memory in relation to changes in the hippocampal region (Jordan), other aspects of memory and learning (Myslivicsek), maternal behaviour (Singh), sleep patterns, exploratory behaviour and avoidance learning to somatostatin (Tamassy).

In sessions 13 & 14 on 'changes in behavioural development in relation to nutritional and non-nutritional factors and the prevention and reversal of developmental retardation', the emphasis was on specific aspects of the home environment critical for development such as patterns of mother child interactions, child care and psychosocial environment (Ricciuti), an emphasis supported by data on the psychological status of children subject to varying degrees of environmental, emotional and/or nutritional deprivation (Rajalakshmi) and deficits in specific aspects of development and their partial reversal by intervention programmes (Muralidharan) and the need for involving parents in such programmes whether home-based or community based (Caldwell, Tompar-Tiu and Mistry). The potentialities and problems presented by Piagetian models for assessing cognitive development were discussed by Dasen.

Session 15 on 'nutrition intervention measures' was concerned with the formulation of nutritionally adequate foods based on locally available foods and their comprehensive evaluation by studies in the laboratory and in the field (Rajalakshmi), the use of supplementary feeding programme based on this approach for vulnerable groups (Chandrasekhar), the impact of the Special Nutrition Programme (SNP), the vitamin A prophylaxis programme (Rao), and the Integrated Child Development Services (Gopaldas) and problems in translating the results of such pilot studies to the national scale (Gopaldas, Bagchi). Gopalan in his special lecture on this aspect emphasised the public health aspects and socio-economic indices associated with malnutrition.

These formal and informal sessions were followed on the 15th by a lecture series on theoretical and methodological problems by key participants. A special lecture on immunology (Chandra) was arranged earlier.

The meeting concluded with a valedictory session at which Metcoff presented a report on the formal sessions. Bagchi in his valedictory address referred to the unabated persistence of malnutrition in poor areas and emphasized the imperative need for political and economic steps.

The workshop promoted a good deal of informal discussion between the participants outside the venue of the conference hall and the seminar rooms and was attended by postgraduate students and staff from the departments of Biochemistry, Child Development, Foods and Nutrition and Pediatrics.

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## ANNOUNCEMENT

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### PROFESSOR C. N. R. RAO

It has been announced that Professor C. N. R. Rao has been elected a Fellow of the Royal Society, London. He was born in 1934 and obtained the B. Sc. degree from the Central College, Bangalore (1951), M. Sc. degree from the Banaras Hindu University (1953) and Ph.D. degree from Purdue University (1957/1958). He then joined the Department of Inorganic and Physical Chemistry of the Indian Institute of Science, Bangalore as a Lecturer in 1959. The D. Sc. degree of the University of Mysore was awarded to him in 1961. In 1963 he joined the Indian Institute of Technology, Kanpur, as the Professor and Head of the Department of Chemistry. Professor Rao was a Visiting Professor at Purdue during 1967-68. He was a Commonwealth Professor at the University of Oxford and Fellow of St. Catherine's College during 1974-75. He came back to the Indian Institute of Science in 1976 where he organised a new unit devoted to solid state and structural chemistry. Professor Rao's main research interests are in chemical spectroscopy, molecular structure, solid state chemistry and surface science. He has employed UV photoelectron spectroscopy in recent years to investigate electron states of free molecules. In solid state chemistry he has made major contributions to phase transitions, defect solids, electronic and magnetic properties of complex metal oxides and spectroscopy of solids. In phase transitions he has carried out extensive studies on structural transitions of inorganic and organic solids. Monte-Carlo simulations of polytypes, mictomagnets and plastic crystals have also been carried out. A variety of oxides and other materials of novel structures have been synthesised in Prof. Rao's laboratory with a view to presenting unified explanations of properties of complex solids based on chemical bonding principles. In the last few years, he has developed the first surface science laboratory in the country with X-ray and UV photoelectron spectroscopy, Auger spectroscopy, EELS and so on. One of the main characteristics of Prof. Rao's research is the multipronged approach

based on extensive use of a variety of modern experimental methods and theoretical calculations.

Professor Rao is the author of nine books and over 300 research papers and reviews. His first book on UV and Visible Spectroscopy was published (Butterworths, London) in 1960, to be soon followed by 'Infrared Spectroscopy' (Academic Press, New York, 1963). His book with Dr. K. J. Rao on "Phase Transitions in Solids" published in 1979 by McGraw Hill, New York, attempts to make a unified presentation of this cross-disciplinary subject.

Professor Rao is a Fellow of the Indian Academy of Sciences (1965) and the Indian National Science Academy (1974). He has received several national and international honours and awards; the Marlow Medal of the Faraday Society, England (1967), the S. S. Bhatnagar prize of CSIR in Chemical Sciences (1968), the Yedenapalli medal and prize of the Indian Chemical Society (1973), the Jawaharlal Nehru Fellowship (1973), the Sir C. V. Raman Award in Physical Sciences of the UGC (1975), the Centennial Foreign Fellowship of the American Chemical Society (1976), Federation of the Indian Chamber of Commerce and Industry prize for research in physical sciences (1977) and the S. N. Bose Medal of the Indian National Science Academy (1980). The President of India bestowed on him the national honour, Padmashri, in 1974. He was elected foreign member of the Academy of Sciences, Yugoslavia in 1981. Purdue University will confer the degree of Doctor of Science (honoris causa) in May 1982.

Professor Rao is a member of the Bureau of the International Union of Pure and Applied Chemistry. He was the Chairman of the Commission of Chemical Education of the International Union till recently and he is now the Chariman of the Commission of Spectroscopy and Molecular Structures. He is a member of the Executive Committee of the Committee on Data for Science and Technology (CODATA) of the International Council of Scientific Unions. Prof. Rao was the Vice-President and is now