SCIENCE NOTES AND NEWS

Award of Research Degrees

Andhra University has awarded the D.Sc. degree in Physics to Shri V. Nagarajan for his thesis entitled "Studies on Chlorine Nuclear Quadrupole Resonance"; and Ph.D. in Physics to Shri P. Balaramarao for his thesis entitled "Studies on Drift and Anisotropy of Ionospheric Irregularities".

M.S. University of Baroda has awarded the Ph.D. degree in Zoology to Kumari A. K. Susheela for her thesis entitled "Studies on the Cellular Organisation and Metabolic Adaptation in the Mammalian Diaphragm".

Conference on "Luminescence"

The Institute of Physics and the Physical Society, 47, Belgrave Square, London S.W. 1, announces that it is arranging a Conference on "Luminescence" to be held in the University of Hull on the 15th, 16th and 17th September, 1964. There will be a number of invited papers but offers of contributions will be welcome. Such offers should be accompanied by 3 copies of short abstracts (100-200 words) which should be sent as soon as possible *and not later than 1 June 1964*, to Professor G. F. J. Garlick, Physics Department, The University, Hull, Yorkshire.

It is provisionally proposed to hold sessions on the theoretical aspects of luminescence, etc., phosphor preparation, single crystal growth, organic phosphor systems, luminescent materials for lasers, etc.

Further particulars and application forms will be available in about June, 1964, from the Administration Assistant.

Symposium on "Glycosides and Saponins"

A three-day symposium on "Glycosides and Saponins" under the joint auspices of Pharmaceutical and Drugs Research Committee, C.S.I.R., and Immunity Scientific Association, Bengal Immunity Research Institute, will be held at the latter's premises at 39, Acharyya Jagadish Bose Road, Calcutta-16, from 2nd to 4th April 1964.

The scope of the symposium covers: (1) Isolation, detection, assay and therapeutic evaluation; (2) Structural features: (*a*) degradative processes, (b) enzymes, and (c) structural evidences on aglycones and sugars; (3) Pharmacological properties including structure-activity relationship; (4) Pharmacognosy, role of glycosides on plant physiology and allied subjects, and (5) Economic production of the active principles. Abstracts and full papers to be presented should reach Dr. A. N. Bose, Secretary, Immunity Scientific Association, 39, Acharyya Jagadish Bose Road, Calcutta-16, before 15th February 1964.

Indian Science News Association

Prizes each of the value of Rs. 250 will be awarded to the authors of articles adjudged to be the best in each of the following subjects: (a) Importance of forests in the economic development of India; (*b*) Future of non-ferrous metals in India; (c) Use of micro-organisms in industry; (*d*) High power chemical fuels; (*e*) Importance of biology in higher secondary education in science.

Last date for submission of articles is 31st March 1964. Further particulars regarding the above 'Meghnad Saha Popular Science Prizes, 1964', can be obtained from the Honorary Secretary, Indian Science News Association, 92, Acharya Profullachandra Road, Calcutta-9.

Occurrence of Salt-Pseudomorphs in the Vindhyans

Shri R. S. Mithal, Department of Geology, University of Roorkee and G. S. Mehrotra, Central Building Research Institute, Roorkee, write:

In Bhima Series (Vindhyans) of Wadi area of Mysore State (previously in Hyderabad State) some well-preserved sedimentary structures have been observed. These consist of stylolites, solution cavities, salt-pseudomorphs, rain-prints, pits and mound structures.

The occurrence of salt-pseudomorphs in upper surface of the limestones overlain by red shales is of great importance to Vindhyan Geology. So far salt-pseudomorphs were reported from the Cambrians of the salt-range (Pakistan) only. Recently Prof. Misra of the Lucknow University has reported the occurrence of salt-pseudomorphs and other sedimentary structures from the upper Vindhyans of Maihar-Rewah areas of Madhya Pradesh and has correlated the Vindhyans with those of the salt-range of Punjab. The present discovery of similar

characters including the minor salt-pseudomorphs from the Lower Vindhyans (in which the Bhima Series are grouped) confirms similar conditions of environments and deposition as those in Maihar-Rewah area. If this observation is confirmed by the detailed work (which is in progress) the stratigraphic position of the limestones of Bhima series occurring in the Mysore area may have to be reconsidered.

Trematoda and Trematode Diseases

Professor George Anastos, Department of Zoology, University of Maryland, writes :

A revision of Stiles' and Hassall's *Trematoda and Trematode Diseases*, Part I : Supergenera and Genera A-B by Mildred A. Doss, Collaborator, U.S. Department of Agriculture, assisted by Katharine Forsyth Roach and Virginia L. Breen, all of the Zoology Department, University of Maryland, has just been published by United States Department of Agriculture. Part II Supergenera and Genera C including the Cercaria will be issued shortly. These publications must be used with the Index-Catalogue of Medical and Veterinary Zoology : Authors, Parts 1-18, Supplements 1-13 as the bibliographical key. Qualified persons may obtain all of these publications free of charge from the Beltsville Parasitological Laboratory, Agriculture Research Service, Beltsville, Maryland, U.S.A.

Occurrences of Paleocene and Eocene Beds in the Barmer District (Rajasthan)

Messrs. H. N. Siddiquie and Iqbaluddin of Geological Survey of India, 27, Chowringhee, Calcutta-13, write :

In the Barmer District, Rajasthan, the Lathi formation (Triassic to Jurassic) is followed by the Barmer Sandstone (Cretaceous) and this by the Kapurdi formation containing fuller's earth (Up. Paleocene to L. Eocene). The fossils from Kapurdi and Nagurda have been described by Barooah (*Current Science*, 1946), Glassner and Rao (*Rec. Geol. Surv. Ind.*, 1957) and Prasad (*Ind. Minerals*, 1961). Recently, Siddiquie collected clay samples from about 10 wells and auger holes in this area between Lat. 25° 45′ and 26° 12′ and between Long. 71° 20′ and 71° 28′, lying between Barmer and Sheo. *Venericardia* of *Semi-inflata* is abundant in the sample from near Rohli, while *Corbula, Arca, Lucina* and *Nuculana* are also present. The microfossils from the various samples include *Cibicides, Rotalia, Globorotalia, Ammobaculites, Haploragmoides, Discorbis, Cyrodina* and *Bolivina*. There are also some minute molluscan shells. Studies of the fossil collection by Iqbaluddin indicate that they are shallow marine benthoric and of Upper Paleocene to Lower Eocene age. The well data indicate the thickness of the Paleocene-Eocene beds to be about 80 m. The strata mentioned here are bordered on the east by the Malani igneous suite and on the west by exposures of Lathi and Barmer beds. The fossils will be described in detail elsewhere.

Semiconducting Polymers

Among polymers there is a group of conjugated-bond polymers. Owing to their "flexible" structure, they show semiconductor properties under certain conditions. Carbon-nitrogen conjugated-bond polymers were first obtained by Academician Valentin Kargin and co-workers. More recently, a group of researchers have synthesized high-molecular carbon-nitrogen conjugated-bond polymers at the Gubkin Institute of Petrochemistry and the Gas Industry.

The reaction was effected between solid salts which were heated to 250–300° C. in an autoclave under a pressure of 20–25 atmospheres in the absence of oxygen. The experiments lasted from five to thirty hours. The new polymers are finely crystalline powders, from light brown to dark brown in colour (depending on the duration of the experiment). They are non-melting substances which begin to decompose at over 700° C.—(*Soviet Science News.*)

Space Activities will reduce Van Allen Belt

At the 14th International Astronautical Congress held in September 1963 at Paris, Dr. S. Fred Singer of the U.S. National Weather Satellite Center stated that the hard-radiation inner Van Allen belt surrounding the earth between the two 40° parallels, discovered by satellites in 1958, will be naturally reduced by man's expanding space activities.

When offering, in 1958, his cosmic ray albedo theory (simultaneously developed independently by Soviet scientists) on how the inner Van Allen belt is maintained, Dr. Singer suggested that the high-energy electrons and protons making up the belt are extremely long-lived (measured in hundreds of years). A very small input of high-energy particles, which result from the action of cosmic rays on the earth's atmosphere and are trapped in the belt by the earth's magnetic field, is sufficient to maintain the belt.

Any electron or proton absorber, which any satellite is, will reduce the radiation present in the belt by absorbing these charged particles faster than they arrive.

"Sweeper" satellites, specifically designed for that purpose, may be practical for wiping up man-made radiation belts, resulting from high altitude nuclear explosions.

Data show that the flux of high energy protons has maxima at two different levels in the space above earth. The first, a higher maximum, is at 1·5 earth radii and the second, a lower one, at about 2·2 earth radii. Dr. Singer hypothesized very speculatively that the second peak may exist only in relation to a proton flux intensity 'valley" created by the presence of a meteoric dust belt, which absorbs protons, at about 2 earth radii.

Synthesis of ACTH

R. Schwyzer and P. Sieber of Ciba Limited have reported the complete synthesis of the molecule adrenocorticotropic hormone (ACTH). The hormone which contains 39 amino-acid sub-units is the largest polypeptide yet synthesized. ACTH is produced by the anterior part of the pituitary gland; it stimulates the adrenal cortex to make a variety of steroid hormones that regulate carbohydrate metabolism and the balance of sodium and potassium in the body fluids. A subsidiary effect of ACTH is to darken the skin by stimulating the activity of the pigment-producing cells melanocytes.

Partial synthesis of the ACTH molecule was reported as early as 1960, by C. H. Li *et al.*, of the University of California, who succeeded in linking together the first 19 amino-acid sub-units of the molecule. This short molecule was found in human subjects to have about 80% of the adrenal stimulating activity of the natural hormone. Later, workers at the Pittsburgh University, and also at Ciba, reported successful synthesis of the molecule up to 24 amino-acid sub-units. Curiously, these shorter molecules showed a greater skin-darkening action than the natural hormones. The explanation is that the first 13 sub-units in ACTH are almost identical with the 13 sub-units found in one form of melanocyte-stimulating hormone (MSH), also produced by the anterior pituitary.

The present report of the synthesis of the complete ACTH molecule should help to clarify how the skin-darkening action of the first 13 sub-units is suppressed by the remaining 26 sub-units.—(*Scientific American*, October 1963.)

Changes in Earth's Magnetic Poles

According to the results of study on rock magnetism conducted by the U.S. Geological Survey, the direction of the earth's magnetic field was reversed at least twice in the course of geological time. In the period between 980,000 and 1·9 million years ago, and prior to 3·4 million years ago the magnetic north pole lay deep in the southern hemisphere. The present orientation of the field has prevailed for the past 980,000 years, and also existed once before between 1·9 m. and 3·4 m. years ago. These conclusions were drawn from a study of old lava flows in many parts of the world, particularly those in Hawaii and those from Mount Etna in Sicily. The remnent magnetism in volcanic rocks faithfully records the direction of the earths magnetic field at the time the lava flows took place. In the present study the rocks were dated by the K–Ar dating method. —(*Scientific American*, October, 1963.)

Summer School on "Molecular Physics" (1964) —Ooty

Under the auspices of the Council of Scientific and Industrial Research and the University Grants Commission, a Summer School on "Molecular Physics" is being organised with special emphasis on current developments. This School is expected to function during the period 17th May to 6th June 1964 in Ooty (Nilgiris). Courses of lectures on the following topics will be delivered by experts in the respective fields: Group Theory; Molecular Orbital Theory and Complexes; Electronic Spectra; Infra-red Spectroscopy; Raman Spectroscopy; Crystal Spectra and Luminescence; Structure Determination by X-Rays; Neutron and Electron Diffraction; Microwave Spectroscopy; and Magnetic Resonance. There will also be Seminar Talks given by specialists followed by discussion on subjects connected with Molecular Physics.

An Organizing Committee has been formed with Professor R. S. Krishnan, Head of the Department of Physics, Indian Institute of Science, Bangalore-12, as the Chairman and Convener. For further particulars, the Chairman may be contacted.

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