

### The Skull of Holocephali.

OUR knowledge about the fish skull is far from being complete and recently a comprehensive account of the Teleostean skulls was published by William K. Gregory. The primitive groups like Holocephali have received very little attention and the paper by G. R. de Beer and J. A. Moy Thomas in the *Phil. Trans.*, 1935 B., 514, is certainly welcome. The former author by a careful study of the available embryological material of Holocephali elucidates the real nature of the palatoquadrate attachment, the structure of the hyoid arch and the nature of the so-called ethmoidal canal. The pterygoquadrate

is fused to the neuro cranium and an otic process is present. The skeleton of the hyoid arch is primitive and possesses pharyngo-hyal and epiphyal; it is non-suspensorial. The presence of the pharyngo-hyal points definitely to the conclusion that the ancestors were never amphistylie or hyostylie. The group Holocephali must have taken its origin from autodiastylie ancestor, from which also the selachian must have radiated. Thus the selachians are closely related to Holocephali. The third point which is stressed in the paper is about the ethmoidal canal; this canal is an extra-cranial space secondarily roofed over when the interorbital septum is formed.

### Science Notes.

*An Interesting Implement for Mud-fishing from Uttarbhag, Lower Bengal.*—At a meeting of the Asiatic Society of Bengal held on 4th March, Dr. S. L. Hora gave an account of a device for securing *Jiol Machh* from marshy areas in Lower Bengal. "A circular basket of the usual material and make, about 9½ inches in diameter and 23 inches in total length, is used. One end of the basket is open and the mouth is strengthened by a circular band of broad bamboo-strips. At a distance of about 16 inches from the mouth, there is another band of bamboo-strips, after which the split-bamboo sticks are pulled together and secured by a loop of string. The loop is fastened to the nearest band. In this way, the other end of the basket is closed and made to serve as a handle for manipulating the basket.

"The split-bamboo sticks, which run lengthwise, are about half an inch apart so that when the open end is dragged through mud, it passed out through the wide spaces and only the fish are trapped inside the basket."

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*A Note on the Distribution of Gloriosa superba Linn. (Vern.:—Bechnag, Kulhari, Bisha, etc.) towards Vikarabad and its medicinal importance.*—Messrs. M. Sayeeduddin and M. Abdus Salam, write: "We pointed out in our previous communication to *Current Science*, Vol. II, No. 3, Sept. 1933, p. 83, that, while ascertaining the distribution of *Lantana camara* Linn. towards Vikarabad we met with at a spot about 24 miles from the Hyderabad city a striking association of *Lantana*, *Gymnosporia montana*, *Butea frondosa*, *Tectona grandis*, *Dodonaea viscosa* and *Gloriosa superba* of which the last named was found evidently for the first time in our excursions towards this side. There is no definite record of its having been found this side before. The only reliable information one can get of the Hyderabad vegetation is from two works namely *Forest Flora of Hyderabad*, Decun by E. A. Partridge (Pub. 1911) and from *The Madras Journal*, Vol. XV (Pub. 1848) in which there are abstracts of botanical reports about Warangal and Dawlatabad districts. Partridge writes (p. 402) that "*Gloriosa superba* is very common everywhere, springing up after the rains in field-hedges and on the outskirts

of forests." Later on he mentions "Common in hedges, chiefly on black cotton soil." The latter statement makes us believe that his observations were made chiefly towards the Marhatwari side where the soil is mostly black and very suitable for the growth of cotton. No mention is made about this plant in the *Madras Journal* either, in which besides others, many plants of medicinal importance have been recorded. *Gloriosa superba* too happens to possess a few valuable medicinal properties (ref. Kirtikar, *Ind. Med. Plts.*, and Watt, *Dict. Econ. Prod. I.*) and it is strange that this plant has escaped the notice and consideration of the author of the above botanical reports.

It was summer time when we last visited Vikarabad. But in order to make a preliminary survey of its vegetation during the rainy season we undertook an excursion recently in August 1934. What was most striking is the gradual spread of *Gloriosa superba* and its association with *Gymnosporia montana* (Family Celastraceæ) whose root-action is claimed by Mr. Abdur Rahman Khan (ref. *Osmania University Research Jour.*, 1934), to be one of those responsible for turning rocks into morum. In all the cases mentioned below *Gloriosa superba* was found chiefly on *Gymnosporia montana*, which seems to prefer rather dry situations and hard substratum. While *Gloriosa superba* does not seem to be restricted to any particular kind of soil, it seems to have its own associations.

The exact spots where this plant was found within a distance of about 52 miles from the Hyderabad city are the following:—

16 miles and 7 furlongs from the city—A single plant on *Gymnosporia montana*. Between 16 and 18 miles—At two spots again in the same association. Between 18 and 19 miles—At several places with *Gymnosporia*, profusely in flower. Between 20 and 21 miles—All cultivated land, in some places slightly hilly. No trace of *Gloriosa*. At 21 miles—*Gloriosa superba* amongst dense vegetation consisting of *Gymnosporia*, *Dodonaea viscosa*, *Zizyphus* sp., and several herbs. Between 21 and 44 miles—No trace of *Gloriosa*. After this nearing Vikarabad it was noticed at one spot only. But it was to be found again in



the thick forest at "Anant Giri", a hill about 2 miles from the Vikarabad village.

It seems probable that *Gloriosa superba* has ultimately found its way towards Vikarabad from the Bombay side where it is met with in abundance. It seems to have followed the other course also from Bombay, that is via Aurangabad towards Hyderabad, and it was on this side, we believe, that Mr. Partridge made most of his observations as is evident from his statement that *Gloriosa superba* is found chiefly on black cotton soil. It is quite probable that *Gloriosa superba* has found its way recently towards Vikarabad. Further investigations are in progress.

**Goat Breeding in Western India.**—The Imperial Council of Agricultural Research has recently provided funds for a scheme of goat breeding to be conducted by the Government of Bombay.

There are two well-defined pure breeds of goat in Western India, (1) the Surti, a small cream-coloured, hornless animal, reared on stall feeding, and (2) the North Gujarat goat, largely reared on grazing and principally used for meat and hair production. The scheme is intended (a) to study the two breeds, the inheritance of their characters, their feeding and management contributing to high milk production, (b) to conduct feeding trials to ascertain the most suitable quantities and qualities of Indian foodstuffs and their most desirable combinations for high milk production and growth, and (c) to investigate the comparative hygienic and food value of goat milk for feeding children, patients and invalids.

The scheme will extend over a period of 10 years and the work will be carried out at 3 stations, Poona, Vadala and Ankaleswar. The Live-stock Expert to the Government of Bombay and the Nutrition Assistant with the co-operation of Mr. I. W. Moomaw and Rev. R. W. Fairbank will conduct the investigations.

**Agricultural Research Institute, Delhi.**—His Excellency the Viceroy performed the ceremony of laying the foundation stone of the Imperial Institute, at New Delhi on the 19th February. In the course of his speech His Excellency pointed out that the location of the Institute at Delhi which being more easily accessible will enable the staff to be in intimate touch with the Indian scientific workers, will remove the atmosphere of isolation, from which the Institute, situated as it was at Pusa, suffered so far.

Referring to the nature of research which the Central Institute will undertake, His Excellency said, "There are problems of fundamental research which it is not possible for each Province with the comparatively limited resources to undertake, nor is it advisable that in the investigation of such problems there should be duplication of effort, and therefore waste of energy and money.... It is my hope that the Institute will be regarded by the Provinces as an integral part of their agricultural organisation and that they would refer to it problems which are not of purely local interest or importance and which they consider suitable for investigation at the Central Place."

"A number of young men return every year from Europe and America after taking research degrees but many of them do not at once find the employment adopted to the full utilisation of their training. Any scheme which would make

it possible for some of the best of them to devote their abilities to agricultural research would be of real benefit to India. This is a direction in which private philanthropy would largely help by endowing as in other progressive countries research fellowships tenable at the Central Institute."

**Institute of Population Research in India.**—The inaugural meeting of the Indian Population Conference will be held at Lucknow during the ensuing *Dewali* holidays under the auspices of the Institute of Population Research in India. The objects of this Institute which has recently been started are briefly to stimulate and organise population researches in different provinces of India, to co-ordinate such researches as are now being undertaken, to hold general and local conferences and to publish the results of researches and discussions at such conferences from time to time.

Population questions in India will play a great part in determining practical, economic, social and political programmes and it is the purpose of the Institute to collect statistics and data and systematise and co-ordinate scientific knowledge in respect of the various elements in the population problems of the country. Researches in the following special fields are now promoted under the Institute:—(1) Population, food supply and vital statistics; (2) Population, crops and agricultural practice; (3) Population and trend of population; (4) Indices of agricultural productivity and population trend in the U. P.; (5) Standards of living and cost of living indices; (6) Population, dietary and nutrition; (7) Anthropometric measurements of the inhabitants of U. P.; (8) Comparative study of the numerical variation of different castes and communities; (9) Economic and vital decline of the primitive people of India; and (10) Migration, rural, inter-provincial and overseas.

Further information regarding the Institute can be obtained from Prof. Radha Kamal Mukerjee, University of Lucknow.

**Evaporation in India calculated from other Meteorological Factors**, by P. K. Raman and V. Satakopan. (*Scientific Notes, India Meteorological Department*, Vol. VI, No. 61).—The paper contains a discussion of the mean monthly and annual evaporation at 80 stations in India. The evaporation is calculated from the formula

$$E = (1.465 - 0.0186 B) (0.44 + 0.118 W) \left( \frac{100}{h} - 1 \right) e$$

where E is the mean daily evaporation in inches, B the barometric pressure at station level in inches, W the mean wind velocity of the day at 4 feet above ground in miles per hour, h the mean relative humidity and e the vapour pressure in inches of mercury. Monthly and annual evaporation charts have been drawn and discussed. The values of "rainfall minus evaporation" at the 80 stations have been calculated; these indicate the arid and the wet zones of the country. Finally, the importance of evaporation in salt-works and its influence on plant life have been discussed.

**Earth Pressure Tables** (Building Research Special Report No. 24. H. M. Stationery Office, Price 2s.)—These tables, published for the first time, give data necessary for calculating the



pressure exerted by granular materials on plane retaining walls of any batter, and are accompanied by a summary of the Revised Wedge Theory in so far as is required by the practical engineer when using the tables.

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*Johne's Disease of Cattle.*—A useful and timely contribution on an important disease of cattle to which much attention has been given only of late appears as Bulletin 167,—New series, Dominion of Canada, Department of Agriculture. The nature, symptoms, post-mortem appearances, mode of the spread of the infection and methods of control of the Johne's disease are described in simple language so as to be easily understood by the live-stock owner. Much is not known yet about the disease but what little is known is brought out clearly in this small brochure. This disease—like tuberculosis—is as insidious as it is fatal, scouring and wasting being its chief signs. The infection is spread by direct contact with the affected animal or through contaminated pastures, ponds, etc. As there are no known methods, yet, of cure or preventive inoculation, the only measures advocated are destruction of the affected and in contact animals or, at least, strict isolation and thorough disinfection of the premises. As there is much reason to class this among the deficiency diseases properly balanced rations with the necessary vitamins and minerals should be particularly provided to all animals.

Certain additional information such as that sheep, goats and deer are also susceptible, though to a less extent than cattle, and that the disease is more often met with in low-lying and damp areas and also that the causal agency may be found in the rectal scrapings and in the milk of affected cows might have been included with advantage.

Much work has yet to be done to investigate the extent of the incidence of the disease and to discover diagnostic, therapeutic and prophylactic agents for combating it effectively. It is most satisfactory to note that the Imperial Council of Agricultural Research has taken up this question in earnest and has also awarded a grant for investigational work in Mysore.

It would be indeed most useful if this monograph could be translated into the various vernaculars in India and distributed among the owners of cattle.—S. D. A.

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*300th Anniversary of the Establishment of Chemical Industries in America.*—The American Chemical Society will be celebrating at New York this Spring the tricentenary of the first serious American Chemical enterprise by John Winthrop, Jr. This will be a happy occasion for, few, even among chemists, have realised that the chemical production of America—measured in dollars or tons—is three times that of Germany, four times that of Great Britain and probably, half of the entire world's output. Modern American Chemical Industry is built solidly on research and holds a splendid record of achievement. It may be mentioned that a recent survey of the activities of the research and process development laboratories of the chemical industries revealed the fact that during the recent depression period, research was being continued without abatement. Many new processes have been developed for making products that could not be produced economically before and many

new processes have been developed that have been designed to meet the needs of new and better living conditions.

During the celebration, a symposium on the "Economic, Social, Scientific and Political Foundations of the Chemical Industries" by leading industrialists, financiers and scientists has been organised. A very elaborate programme has been arranged with the assistance of the Merchants' Association, art and educational institutions and entertainment organisations of the New York City. Messrs. Lamont du Pont, E. M. Allen and George W. Merck, will co-operate with the Committee of the American Chemical Society headed by Prof. Arthur Hixson, in making the necessary arrangements.

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Prof. William Whitehead Watts, F.R.S., the famous Geologist and author of the well-known '*Geology for Beginners*' which for 40 years has "provided the first introduction of the science to young Geologists in all the English-speaking World" has been elected President of the British Association for the Advancement of Science, 1935.

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*The Ramanujam Memorial Prize in Mathematics* for 1933 which was offered by the Madras University for the best thesis based on original contributions submitted by an Indian (or one domiciled in India) on some definite branch of Mathematics, pure or applied, has been divided equally among (1) S. Chandrasekhar, M.A., for his thesis entitled "Polytropic Distribution"; (2) S. Chowla, Ph.D., for "The Theory of Dirichlet's L-Functions" and (3) D. D. Kosambi, for "Notes on the Mathematical Analysis of Space".

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*Element with Atomic Number 93.*—Under the title *Bohemium—an obituary*, Max Speter, in a note published in *Science* (1934, 80, 588) draws attention to the fact that the alleged element of atomic No. 93 and atomic weight 240, discovered by Odelen Koblic has been subjected to rigorous X-ray spectrographic study by Walter and Ida Noddack at Berlin. Negative results for an element of atomic No. 93 were obtained. Chemical tests show that the specimen consisted chiefly of tungsten, vanadium, etc. and tungsten was responsible for the observation that had led Koblic into his erroneous statement.

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*Irrigation Research in U.P., 1933-34.*—The activities of the research section were confined to (1) the investigation of losses in water courses and in channels, (2) the study of the best means of lining channels and water courses, and (3) the design of distributary heads intended to exclude heavy silt. As it was of great importance to ascertain whether the lining of water courses was economically justified in tube-well projects, a very large number of experiments were undertaken to ascertain gul losses. The losses in small water courses varied with the depth of water. At present, the prevailing low prices make the lining of channels a doubtful economy. A number of fresh observations of losses in distributaries and minors showed that in general, the large channels gave smaller losses than the small ones, which fact lends colour to the view that the greater part of the losses occurs through the sides of channels. The greatest scope for lining is in small channels and water courses, and with this object several lining experiments were conducted.



A new form of lining, consisting of from one half inch to one inch thickness of cement mortar, reinforced with open weave hessian, was found useful. Tests into a number of silt-excluding heads constructed on different distributaries show that there are no means of complete silt exclusion; all that is possible is to reduce the amount. Experience on the Sarda Canal has shown that regime slopes are a function of the silt factor or type of silt transported, and that with a fine silt are associated flatter water surface slopes. Valuable silt distribution curves obtained from the Research Institute, Lahore, have shown that silt sampling is a most useful adjunct to the study of channel behaviour.

*Annual Report of the Director, Research Institute, A. & P. Tibbi College, Delhi, for the year 1934.*—This institute was started in March 1930 and is devoted to researches on the chemical constituents of indigenous medicinal plants. Valuable work on the alkaloids of *Holarrhena antidysenterica*, which has acquired immense medicinal interest through the pharmacological and therapeutic investigation of Col. Chopra and his co-workers as a cure for amoebic dysentery, has been carried out by the Director and his collaborators. The synthesis of the chief alkaloid of the plant Conesine has been achieved and this is a matter of considerable industrial significance. Among other researches carried out at the Institute, mention may be made of the work on the constitution of ajmaline and its subsidiary alkaloids, isolated from the *Rauwolfia serpentina*, Benth. These alkaloids have been successfully employed as a cure for violent insanity, chronic insomnia and chronic uterine and intestinal sluggishness. The work relating to the alkaloids of *Cassia absus*, Linn. also deserves mention.

In this report, the Director has stressed the need for expanding the Institute so as to include a Pharmacological Section. This is only appropriate as the work of the Institute is of a specialised character and calls for the co-operative efforts of organic chemists and pharmacologists. We hope that the authorities would be able to supply this long-felt want at an early date.

*Indian Chemical Society—Eleventh Annual General Meeting, 1935.*—At the annual meeting held on the 4th January 1935 with Dr. N. R. Dhar, the President of the Society, in the Chair, the following office-bearers were elected:—

*President:* Sir U. N. Brahmachari (1935-36); *Vice-President:* Sir Martin Onslow Forster (1935-37); *Honorary Secretary:* Prof. R. Ray (1935); *Honorary Treasurer:* Dr. Sudhamoy Ghosh (1935); *Honorary Auditors:* Mr. P. C. Nandi and Mr. J. P. Mookharjee (1935); *Ordinary Members:* Prof. R. N. Sen (Bengal) 1935-37; Dr. T. S. Wheeler (Bombay) 1935-37; Dr. P. C. Guha (S. India) 1935-37; Dr. K. R. Krishnaswami (S. India).

The President presented the Sir P. C. Ray 70th Birthday Commemoration Medal for 1933 to Mr. Susil Kumar Ray for his work on "Polyhalides" adjudged to be the best paper for the competition.

The President announced that Mr. Pulin Behari Sarkar has been recommended by the Board of Examiners for the J. M. Das Gupta Medal.

A Special Committee of the Council was formed in order to consider the advisability of instituting

Associate membership, publishing news bulletin and abstracts of papers in the *Journal of the Society*.

We acknowledge, with thanks, the receipt of the latest number (Vol. VI, No. 4, Dec. 1934) of the *Quarterly Journal* published by the Geological, Mining and Metallurgical Society of India, Calcutta. The Society has to be congratulated on having successfully run the journal for these six years, thus providing a means of publication for several important papers on geological and allied subjects from workers in different parts of India. The general get-up of the journal is quite good. It strikes us, however, that the rates of subscription charged (Annual Rs. 16, Single copy Rs. 6) are a little too much, even after providing a wide margin for the high cost of scientific publication in India. We wish the journal a useful and prosperous career.

We have received three numbers of Volume I of *Marriage Hygiene*, a new Journal which is published from Bombay under the Editorship of Dr. A. P. Pillay. The journal is intended to diffuse sane and scientific ideas of sex problems and the use and technique of contraceptive methods among the educated Indians. Writing about the journal, Mrs. Edith How-Martin expresses as follows:—

"If this new journal of *Marriage Hygiene* can help to bring the light of scientific knowledge to bear upon and to overcome even some of the prejudices and social and religious taboos with which marriage is surrounded, it will make a notable contribution to human happiness."

Our sentiments are identical. The number for February 1935 contains articles written by the well-known writers like, Havelock Ellis, W. F. Geikie-Cobb, G. L. Gillin, R. R. Awati, Waldemar E. Coutts, Paul Popenoe, G. S. Ghurye, A. R. Kaufman and others.

We acknowledge with thanks the receipt of the following:—

"Actualites Scientifiques et Industrielles", Nos. 161, 163, 164, 165, 167, 170-175; 178-179; 184, 188, 194, 195, 197, 198, 205 and 208. (Hermann et cie, Paris).

"Journal of Agricultural Research," Vol. 49, No. 9, Nov. 1934; Index to Vol. 48, Jan. 1-July 15, 1934.

"Journal of Agriculture and Live-stock in India," Vol. 5, Pt. I, January 1935.

"The Journal of the Royal Society of Arts," Vol. 83, Nos. 4288-4291.

"Indian Journal of Agricultural Science," Vol. 4, Part VI, December 1934.

"Journal of the Annamalai University," Vol. IV, No. 1, January 1935.

"Biochemical Journal," Vol. 28, No. 6, Vol. 29, No. 1, 1935.

"American Journal of Botany," Vol. 22, No. 1, January 1935.

"The Journal of the Institute of Brewing," Vol. 41 (Vol. 32—New Series), No. 2, February 1935.

"Canadian Journal of Research," Vol. 12, No. 1, Jan. 1935; and Index to Vol. 11, July-Dec. 1934.

"Chemical Age," Vol. 32, Nos. 813-816.

"Berichte der Deutschen Chemischen Gesellschaft," Vol. 68, No. 2.

"The Journal of the Indian Chemical Society," Vol. 12, No. 1, January 1935.



"Experimental Station Record," Vol. 71, No. 6; Vol. 72, No. 1.

"Indian Forester," Vol. 61, No. 2, February 1935; No. 3, March 1935.

"Forschungen und Fortschritte," Vol. 12, Nos. 4-6.

"The Quarterly Journal of Geological, Mining and Metallurgical Society of India," Vol. 6, No. 4.

"Report on the 3rd Imperial Mycological Conference," 1934.

"Report of the 22nd Annual Conference of Educational Associations," held at the University College, London, 1934.

"Union of South Africa—Fisheries and Marine Biological Survey" Report No. 11, for the year ending December 1933.

"Report of the Fermentation Industries for 1934," by R. H. Hopkins and F. W. Norris.

"Second Report of the Royal Institute of Science, Bombay" (1926-1934).

"Indian Journal of Veterinary Science and Animal Husbandry," Vol. 4, No. 4, December 1934.

"Scripta Mathematica," Vol. 3, No. 1, January 1935.

"Nature," Vol. 135, Nos. 3404-3407.

"Natural History," January 1935 and February 1935.

"The Journal of Nutrition," Vol. 9, Nos. 1 and 2.

"Journal of the Osmania University College," Vol. 2, 1934.

"The Journal of Chemical Physics," Vol. 3, No. 2.

"Journal de Chimie Physique," Tome 31, No. 10; Tome 32, No. 1.

"The Indian Trade Journal," Vol. 116, Nos. 1494-1498.

"Indian Journal of Medical Research," Vol. 22, No. 3, January 1935.

"Marriage Hygiene," Vol. 1, Nos. 1-3, 1934-35.

"Department of Commercial Intelligence and Statistics, India,—Monthly Statistics of the Production of Certain Selected Industries of India" October 1934, No. 7 of 1934-35.

"Bulletin of the Patna Science College Philosophical Society," No. 5, January 1935.

## Academies and Societies.

### Indian Academy of Sciences.

(Proceedings, Vol. I, No. 8.)

#### SECTION A.

B. V. RAGHAVENDRA RAO: *Examination of Molecularly Scattered Light with a Fabry-Perot Etalon. Part II. Liquids: Toluene and Carbon Tetrachloride.*—It is found that the relative intensities of the central to the outer Doppler components is much greater for carbon tetrachloride than for toluene. The shift, reported by Cabannes, of the central Rayleigh line towards the red is unreal and is due to the fluctuations of temperature and pressure of the surroundings. T. S. SUBBARAYA: *On the Analysis of the Band Spectrum of Cadmium.*—The peculiar behaviour of the ground state, observed by the author for mercury, in having  $\Delta F$ 's which increase at first and then decrease, and in having a large anharmonic term, is found also in the case of cadmium. M. A. GOVINDA RAU AND B. N. NARAYANASWAMY: *Effect of Solvent in Dipole Moment Measurements.—Polarisation and Moment of Nitro-benzene.*—Six different solvents have been used, and the structure of the  $-\text{NO}_2$  group is discussed. M. A. GOVINDA RAU: *Theory of the Solvent Effect in Dipole Moment Measurements.*—On the basis of the theory of Raman and Krishnan of anisotropic field constants prevailing in a liquid medium, a rigorous expression is derived for the polarisation of a solute in infinite dilution in a non-polar solvent, after eliminating the influence of the solvent. A. N. MELDRUM AND K. S. VAIDYANATHAN: *Synthesis of Substances Related to Cochinilic and Carminic Acids.*—The synthesis is effected through the condensation of chloral with 5-hydroxy-*m*-toluic acid. S. CHOWLA: *On Sums of Powers.* S. CHOWLA: *Some Infinite Series.* S. CHOWLA AND S. SASTRY: *On Sums of Powers.* P. K. SESHAN: *Chemical Studies on Coal.*—A study of a number of coals from the Indian and the American coal-fields shows that cellulose is destroyed very

much more rapidly than lignin at the earlier stages, and more slowly than lignin at the later stages of coalification. R. K. ASUNDI, C. M. BHASKER RAO AND R. SAMUEL: *On the Absorption Spectra of Some Organo-Metallic Compounds.*—Dimethyl, diethyl and diphenyl mercury, and diphenyl lead are among those studied in the vapour state. The results are discussed with Frank-Condon diagrams. K. NAGABHUSHANAM:

*On the Form  $\sum_{r=1}^n p_r dq^r$ —Hdt.* S. CHOWLA: *The Lattice Points in a Hypersphere.*

#### SECTION B.

S. S. PATWARDHAN: *On the Structure and Mechanism of the Gastric Mill in Decapoda. III—Structure of the Gastric Mill in Anomura.*—The seven types of Anomura examined contained a complex gastric mill. A brief account of the cordiac and the pyloric stomach and a comparative account of the principal ossicles of the gastric mill is given. S. S. PATWARDHAN: *On the Structure and Mechanism of the Gastric Mill in Decapoda. IV.—The Structure of the Gastric Mill in Reptantous Macrura.*—The suborder Macrura can be divided into two groups (a) Reptantous Macrura comprising crayfishes and lobsters, and (b) Natantous Macrura comprising prawns and shrimps. The former group is characterised by a universal presence of the gastric mill. BANADUR SINGH AND T. N. SHIVAPURI: *The Gametophytes of Nectunia oleracea.* *Lour.* B. N. SINGH AND R. S. CHOUDHURI: *Induced Morphological, Physiological and Chemical Variations Following Seed-Exposure to X-Radiation in Nicotiana tabacum.*—As a result of the treatment with softer doses more vigorous and healthy crops can be produced. Variabilities in offspring are produced by X-radiation. T. EKAMBARAM AND RAMA RAO PANGEE: *Contributions to Our Knowledge of Balanophora. I.*—The morphological relationships of the host with parasite as well as the manner of origin of the inflorescence has been dealt with.