

by means of main valencies into chains. The elastic properties are closely associated with the length of the chain. The saturated rubber obtained by hydrogenation is also elastic and is stable in air unlike the ordinary rubber which becomes brittle being attacked by oxygen. A reference was made to the excellent synthetic rubber from 2-chloro-butadiene and the great impetus which synthetic rubber research would obtain from Staudinger's work.

Colloid Chemistry of milk in relation to infant feeding and humanisation: Mr. M. Sreenivasaya.—The condition of the casein micellæ in its natural environment varies with different milks, the degree of its dispersion and its state of hydration being largely influenced by the content of (1) Lactalbumin, (2) the non-protein nitrogen and (3) the other crystalloidal constituents like lactose and salts. Milks having higher percentages of the components, in general, exhibit a higher degree of dispersion of their suspensoids and emulsoids and are more easily digestible. The fact that the digestibility of cow's milk can be enhanced by the addition of 0.5 to 1.0 per cent. urea, is a significant advance in the humanisation of milk.

The problem of humanisation was not merely a question of reduction and stabilisation of the colloidal particles of milk. The nutritive value of the dispersing and stabilising agents had to be considered in that connection. Attention was drawn to the limitations of humanisation imposed

by an imperfect knowledge regarding the composition of the caseins and lactalbumins from various milks.

ORIGINAL PAPERS.

21 papers were presented before the Session:—Physics, 8; Inorganic and Physical Chemistry, 4; Organic Chemistry, 2; Biochemistry, 1; and Industrial Chemistry, 3.

PUBLIC LECTURES.

Rao Bahadur Prof. B. Venkatesachar, M.A., F.Inst.P., gave a Lecture illustrated by lantern slides on "Transmutation of Elements", a subject of great theoretical importance. Dr. V. K. Badami delivered an address on "Sugarcane in Mysore", a subject of high economic interest. The lecturer exhibited several specimens of improved canes.

SOCIAL EVENTS.

Sir Venkata and Lady Raman were "At Home" to the delegates and the elite of Bangalore, on the 18th April. On the 20th April, there was another "At Home" arranged by the Societies participating in the Session, at the premises of the Industrial and Testing Laboratory.

VISITS.

Visits were arranged to the Government Transformer Factory and Government Industrial and Testing Laboratory. A whole-day excursion was also arranged for visiting the Mysore Iron Works, Bhadravati. At all the places excellent arrangements were made for the reception of the delegates.

Science Notes.

A Study of the Boundary Lubricating Value of Mineral Oils of Different Origin. (Lubrication Research Technical Paper No. 2. H. M. Stationery Office, Price 9d.).—This Report discusses the results of a more extended investigation on the lines described in Lubrication Research Technical Paper No. 1. That paper attempted to analyse the properties of commercial lubricating oils under boundary conditions but as two oils only (of unknown origin) were employed it was thought unsafe to base general conclusions on the results. In the present investigation oils of known origin have been employed and their properties as lubricants under boundary conditions have been correlated with what is known of their chemical constitution, particular attention being paid to the influence of wax. The results of a few preliminary experiments on the specific effect of the bearing surfaces are discussed.

The Evaluation of Glare from Motor Car Headlights. (Illumination Research Technical Paper No. 16. H. M. Stationery Office. Price 1s. 6d.).—The present paper applies the results of previous research undertaken by the Illumination Research Committee, to the practical problem of assessing the actual glare arising from powerful motor car headlights. By the method described in the paper a "figure of merit" with respect to freedom from glare can be obtained for any proposed headlight system. No attempt is made in the paper to lay down an ideal distribution of light nor to prescribe an actual anti-glare headlight. The practical aim is to help designers of headlights and others interested to assess the merits of

various distributions of light, without necessarily having to construct actual headlights to produce such distributions.

* * *

Atmospheric Pollution (Twentieth Report). (H. M. Stationery Office. Price 5s.).—Smoke pollution affects us in many ways—the cleanliness of our homes, the air we breathe, the state of preservation of our historic and other buildings, the sunlight we enjoy and so on. Data regarding deposited impurity, suspended impurity, destructive gaseous impurity, obstruction of light are therefore of close interest. It is the purpose of the investigation of Atmospheric Pollution, the Twentieth Report of which is now available, to supply such data.

* * *

Scientific Results of the Dutch Expedition in Karakorum and the neighbouring areas in the years, 1922, 1925 and 1929-30.—The first volume which has recently been published, comprises the scientific results dealing with Geography, Ethnography and Zoology collected during Dr. Visser's three expeditions. The results referring to the other branches of science will be incorporated in the subsequent volumes. According to a notice appearing in the *Sunday Statesman* dated 31st March, the most thrilling pages of the book will possibly be those in which Dr. Visser describes the history of the discovery of Karakorum with dramatic simplicity. Mrs. Visser has given an account of her Ethnographical studies. Dr. Sunder Lal Hora of the Zoological Survey of India, has described the 418 specimens of fishes collected by Dr. Visser and his friends. 87

specialists have contributed to the first volume making it a scholarly production of great importance.

* * *

Mount Everest Expedition.—A fresh attempt to scale the Everest is to be made this year by a British Expedition under the leadership of Mr. Hugh Rutledge.

Mount Everest was 'discovered' by trigonometrical calculation 80 years ago. The first attempt to scale the peak was made in 1921 by Lieut.-Col. C. K. Howard Bury. In 1922, General Bruce with a party of experienced mountaineers reached a height of 27,300 feet only 2,000 feet remaining to reach the peak; with the experience gained in this attempt, General Bruce made a second attempt in March 1924 but unfortunately this too proved unsuccessful and the leader and also Mr. S. L. Mallory, another experienced mountaineer, lost their lives. 8 years later Mr. Hugh Rutledge led an expedition and reached a height of 28,000 feet, about 1,000 feet below the summit. Owing to the difficulty of negotiating the rocks covered with loose snow this attempt too proved futile. In the same year four British airmen flew over the peak at a height of 35,000 feet. They have taken a number of photographs and made several important observations and these are now available to the experienced leader, Mr. Hugh Rutledge, who is shortly to make another expedition this year.

* * *

The All-India Modern History Congress will be opened by the Governor of Bombay, at Poona on June 8th. Dr. Shafaat Ahmad Khan has been elected President. A historical exhibition has been organised and tours to places of historical interest will be arranged for the delegates during the session.

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The International Congress of Neurology will be held in London from July 29th to August 2nd.

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The seventh International Congress on Industrial Accidents and Diseases will be held at Brussels, Belgium, from July 22-27.

* * *

The tenth Congress of International Society of Surgery will be held at Cairo from December 30th to January 4th, 1936, under the presidency of Prof. A. Von Eisberg of Vienna.

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The fourth International Congress of Agricultural Industries will be held at Brussels from July 15-27.

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Professor Kenneth Aston of Cardiff has been appointed Professor of Electrotechnology, Indian Institute of Science, Bangalore.

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Dr. Ziauddin Ahmed, Member, Legislative Assembly, has been elected Vice-Chancellor of the Aligarh University.

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The Syndicate of the Annamalai University has appointed Dr. S. N. Chakravarthi, Professor of Chemistry, Annamalai University, temporary Vice-Chancellor, in the place of Mr. S. E. Ranganathan, on his retirement.

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Dr. R. P. Paranjpye, whose term of office as Vice-Chancellor of the Lucknow University, expires on September 15th next has been re-

appointed Vice-Chancellor for a further period of three years.

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The Director of Industries and Commerce, Government of Hyderabad, invites applications from *Mulki* candidates for 3 scholarships for 2 years for training in Sugar Technology at the Harcourt Butler Technological Institute, Cawnpore.

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It is understood that permission has been granted to Professor W. Norman Brown, Professor of the American School of Indian and Iranian Studies and Director of Fine Arts in Boston, for archaeological excavations in Sind. The excavation work is expected to commence during the next autumn.

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Mr. H. G. Champion, M.A., I.F.S., Silviculturist, Forest Research Institute, Dehra Dun (India), is leaving India for 8 months, on leave. Mr. M. V. Laurie, I.F.S., will officiate in his place during the period.

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From Moscow comes the announcement that before the close of the year a rocket aeroplane capable of flying at terrific speed will be piloted through the rarefied air of the stratosphere. The result of the experiment will be watched with the greatest interest as the possibility of using rocket-propelled machines for flying in the stratosphere, with the idea of eventually reaching the moon is being talked about by a large number of scientists.

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Dr. H. W. Dudley, Biochemist, Medical Research Council and Dr. Chassar Moir, London University Gynaecologist, have isolated an alkaloid from ergot, named ergometrine, which produces strong contractions of the uterus after 8 minutes, if administered orally, and within 4 minutes by hypodermic injection.

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Hydrogen of atomic weight 3—tritium—the evidence for which was obtained by nuclear disintegration processes at Cambridge and at the Palmer Physical Laboratory, Princeton, has now been produced by Dr. P. W. Selwood of the Frick Laboratory at Princeton by the electrolysis of 75 tons of water over a period of 1 year. 0.5 c.c. of the precious fluid has thus been obtained. This type of hydrogen exists in a concentration of 1 part in ten thousand million parts of ordinary water.

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The taste of 'heavy' water.—Professor H. C. Urey and Dr. S. Failla who have compared the tastes of 'heavy' and ordinary distilled water conclude that the pure deuterium oxide has the same taste as ordinary distilled water. The 'dry' burning taste experienced by Professor Hansen, of Oslo, on tasting 'heavy' water thus remains unconfirmed.

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In the course of an article on "Animal Husbandry in India," appearing in *Statesman*, 30th March, Col. A. Oliver, Animal Husbandry Expert, Imperial Council of Agricultural Research Department, stresses on the need for organising Animal Husbandry Departments in every Province and State, "devoted solely to the interests of livestock and capable of carrying on systematic disease investigation and control and of giving

effective assistance and advice to villagers throughout the country in such matters as expert selection and registration of improved stock combined with better feeding of females and young stock; the proper selection and care of suitable sires combined with systematic castration of inferior males; and in the disposal of their stock and produce." In the past, there has been no organised effort and there has been none of that continuity from generation to generation without which no lasting progress can be effected in livestock improvement.

* * *

In the course of his presidential address delivered at the annual meeting of the Indian Chemical Society (Punjab Branch) Prof. Ruchi Ram Sahni dealt with "The Place of Science in Mass Education", a subject of very wide appeal. He outlined the constructive proposals for rationalising the education of pupils so as to make them well fitted for life. At home and at school, boys and girls should, throughout, be imbued with the spirit of science and the training should be so designed as to inculcate in the child a distinct bias in the direction of a proper scientific appreciation of facts and principles with which he may be brought into contact in the course of his studies or observation. "No subject of instruction is capable of exciting, stimulating and satisfying the same variety of tastes and interests and bringing the mind and the soul of the pupils into relation with their surroundings in the same intimate manner as the study of the sciences does."

* * *

Stricken Formosa.—A severe earthquake rocked Formosa on the 21st April and is the worst in the Japanese territory since the disaster of 1923, when about a hundred thousand deaths were caused. As a result of the recent cataclysm two Provinces were devastated and four large towns were severely affected. Nearly three thousand persons are reported to have perished, about ten thousand houses collapsed and more than eleven thousand were damaged. The total loss to property is estimated to exceed 10,000,000 yen. Fortunately the sugarcane industry has been spared. An oilfield in the stricken area is reported to have rocked severely releasing a gusher which caught fire, adding terror to the inhabitants.

Stricken Formosa has evoked the sympathy of the nations and offers of help are forthcoming from the American Red Cross and other organisations.

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Co-operation in Tea Research.—With a view to secure personal contacts between the staffs of the various Research Institutes devoted to Tea Research, Dr. R. V. Norris, Director, Tea Research Institute of Ceylon, with Mr. Forbes of the Planters' Association, Ceylon, will shortly proceed to Java, where they will have every opportunity to study the Research Organisations. They will be accompanied in the tour by Mr. Carpenter, the Director of the Tocklai Experimental Station, India. Arrangements have also been made for Mr. T. Eden, Agricultural Chemist, Tea Research Institute of Ceylon, to visit the Tocklai Station and for Mr. Cooper of the Tocklai Station to visit the Tea Research Institute of Ceylon.

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The Kelvin Medal awarded by the Electrical Institute for outstanding Researches was presented to Sir Ambrose Fleming, the octogenarian inventor of the thermionic tube.

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Professor L. Ruzicka of the Technische Hochschule, Zurich, will be a visiting Professor at the Department of Chemistry, University of Chicago, during the summer quarter beginning June 15th. The Professor will give two series of lectures: (1) Special topics in the chemistry of alicyclic compounds and terpenes and (2) Selected topics in Biochemistry.

* * *

According to a note appearing in "Chemical Age" the measures taken to eradicate malaria during 1931 as reviewed at a recent Moscow conference, include spraying from air craft over 600,000 hectares of marshland with Schweinfurt green and flooding 25,000 hectares with petroleum by the same means. 7,000 hectares of marshy ground have been drained. The Soviet Union has allocated 80 million roubles for fighting malaria in 1935. At the Conference, reference was made to the new synthetic anti-malarials, *Plasmozit* and *Akwichen*.

* * *

We have just received the Supplement to the *Journal of the Zoological Society*, Muslim University, Aligarh, India, dealing with the zoological laboratories, their equipment and staff. This is one of the many well-equipped teaching universities in India coaching students for the B.Sc. (Hons.), M.Sc. and Ph.D. courses. Besides lecturing work, the list of research papers given at the end of the supplement gives us to understand that the members of the staff are also pursuing original investigations in Helminthology and we do not very well agree with them when they say on page 2, that "This is the only university institution in India where research in Nematology in relation with the Tropical Diseases of Man and the Domestic animals is carried out." It is such a pity that the "Muslim community has not yet realised the value of research." This narrow-mindedness is not an exclusive monopoly of the Muslim community. It is largely prevalent elsewhere also. We hope that this limitation will soon disappear, and in building up the reputation of any department it is necessary to have a capable director inspiring an enthusiastic band of workers besides possessing a good library. We expect to see all this in the zoological laboratories of the Aligarh University.

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The report on the Royal Botanic Gardens for 1933-34, which has been recently published, clearly points out the scientific and educational value for India of the Botanical Gardens. During the year considerable progress was made towards the enrichment of the Garden as a repository of the more useful and beautiful tropical and semitropical trees and shrubs. The garden of medicinal plants started sometime ago has been added to and renewed. Large exchanges with gardens abroad have been kept up. The requests for identification of specimens have been on the increase and the Royal Botanic Gardens have actively helped several institutions in starting reference herbariums. Thus, the School of Tropical Medicine, Calcutta, is building up a herbarium of medicinal plants with the help of the Royal Botanic Gardens and the Forest

Research Institute, Dehra Dun, received a collection of duplicate Malayan specimens. The report also mentions that a treatise on Indian Water plants intended primarily for distribution by the Malaria Survey of India for workers engaged in researches on the distribution of malaria carrying mosquitoes, is under preparation.

We acknowledge with thanks the receipt of the following:—

"Journal of Agricultural Research," Vol. 49, Nos. 10 and 11.

"The Journal of the Royal Society of Arts," Vol. 83, Nos. 4296-4300.

"Biochemical Journal," Vol. 29, No. 3, March 1935.

"American Journal of Botany," Vol. 22, No. 3, March 1935.

"The Journal of Institute of Brewing," Vol. 41 (Vol. 32, New Series), No. 4, April 1935.

"Canadian Journal of Research," Vol. 12, No. 3.

"The Chemical Age," Vol. 32, Nos. 821-825.

"The Journal of the Indian Chemical Society," Vol. 12, Nos. 2 and 3.

"Experimental Station Record," Vol. 72, No. 2.

"Forschungen und Fortschritte," Vol. 11, Nos. 10-12.

"The Quarterly Journal of Geological, Mining and Metallurgical Society of India," Vol. 7, No. 1, March 1935.

"Monthly Statistics of the Production of Certain Selected Industries of India," No. 9 of 1934-35, December 1934.

"Functions and Organisation of the Indian Meteorological Department," Government of India, Department of Industries and Labour, 1935.

"List of publications of the Institute of Plant

Industry—Leningrad, U.S.S.R.," for the year 1933.

"Report and Accounts of the Coconut Research Scheme for 1934," March 1935. Sessional Paper, Part 4, 1935.

"Coconut Research Scheme for 1933," April 1934, Sessional Paper, Part 5, 1934.

"Coconut Research Scheme for 1932," May 1933. Sessional Paper, Part 8, 1933.

"The Coconut Research Scheme, Ceylon," Bulletin No. 1, Report on the Soap Industry in Ceylon, November 1934.

Review of the activities of the Coconut Research Scheme of Ceylon," by Dr. R. Child (Reprint from the "Tropical Agriculturist," Vol. 83, No. 1, July 1934).

"Handbook of the Institute of Agricultural Research—Facilities of Study and Research," Benares Hindu University.

"Mathematics Student," Vol. 2, No. 4.

"Medico-Surgical Suggestions," Vol. 4, No. 4.

"Journal of the Indian Mathematical Society," Vol. I, No. 4.

"Nature," Vol. 135, Nos. 3412-3416.

"Natural History," Vol. 35, No. 4, April 1935.

"The Journal of Nutrition," Vol. 9, Nos. 3 and 4.

"The Journal of Chemical Physics," Vol. 3, No. 4.

"Journal de Chemie Physique" Vol. 32, No. 3.

"Research and Progress," Vol. I, No. 2, April 1935.

Inter-University Board, India—Annual Report 1934-35.

"Russian Journal of General Chemistry," Tome 4 (66), No. 9.

"Science Progress," Vol. 29, No. 116.

"The Indian Trade Journal," Vol. CXVII, Nos. 1501, 1505.

The Spirit of Research.

IN an interesting address to the Fellows and Associates of the Institute of Chemistry at their Annual Meeting, Prof. J. F. Thorpe dealt with certain aspects of the profession of Chemistry both in academic life and in industry. (*Vide J. and Proc.*, 1935, Pt. II, p. 121.) Although these remarks were primarily intended for the chemists, they do nevertheless hold true for others as well; it appears therefore to be of importance to extract the relevant portions of the address.

These remarks relate to the application of team-work for the solution of important and urgent problems. This idea of team-work is the legacy of the Great German Schools led by Bensen, Victor Meyer, Fischer and others and in England by Perkin Jr. of recent memory. In all these instances, the individual was deeply engaged in one major problem with a number of research workers, while other questions of moment were also examined by him side by side. Thus, individualism marks out generally the man of superior merit and it is an innate quality which can neither be manufactured in the laboratory, nor its power be suppressed or hidden for long. Those who lack it, are mere workers under direction, however great their manipulative skill may be. Unless this quality is discovered and given free play, the force that directs other minds becomes dormant and rusty. In the present day,

team-work has lost this sense of expression of the individual and is replaced by grouping a number of workers, working for the state under some recognised leader. This feature is the resultant of war-time activities, when all brains and manipulative skill were harnessed by one, two or more powerful individuals, who co-operated among themselves. These were extraordinary circumstances.

Post-war conditions have not tended to modify the above system but extended it in a more virulent form—a feature which is the very essence of many Research Associations and industrial firms, resulting in or aiming at Mass Production. In consequence, individualism is not generally recognised resulting in necessarily killing craftsmanship. One of the chief aids to the development of individuality is indicated by *the impetus of acknowledgment and publication*. In order to encourage the workers in a team, it is quite essential to secure the publication of results under the names of the workers concerned which, many a time, is lost sight of by those above. By so doing, the individual worker feels confident, that he is capable of taking up other work, when the need arises for it.

How this capacity for the expression of the individual in a person can be detected, is a matter for serious consideration and is generally solved by

the persons concerned, in the light of their experience. It is, however, significantly true that neither our modern system of education nor the training in the post-graduate course, provides adequate ground for such recognition. According to Prof. Thorpe, the institution of Ph.D. degree in several universities, represents one way of overcoming the defects. This method may be open to question, particularly when we consider that many universities have abolished or are considering the abolition of this degree. It is claimed that the three qualities—self-reliance, patience and initiative, so necessary to work of merit—are evinced by an average worker for the above degree. Men of experience may have a different tale to tell. Another defect, inherent to the selection of the proper individual lies in the fact that different universities have different standards in science training. In the case of higher degrees the institution of qualifying examination by the Institute of Chemistry, is of great benefit to the research worker in the making. In this way, he becomes a "qualified" chemist.

Speaking about the system of research control by committees, it has been said that it is also the outcome of the war and has continued even to-day. Given wide breadth of view and strong human sympathy on the part of the persons composing the committee, it is one of the best methods of solving some urgent problem, but in wrong hands, it is highly susceptible of destroy-

ing personal initiative and individuality. Team-work in such cases demands that there should be free discussion among the members of the team. It is, however, rather unfortunate that the members cannot individually claim personal merit for any discovery or work of outstanding merit, while the results of such investigations form the property of the whole team. The snag, in such cases, is that the humble worker does not get adequate recognition for his work, which is rightly due to him. On the other hand, if members of a team do not exchange notes or discuss freely for fear that some one else might get the credit for what is originally his, the benefits of co-operative effort are completely lost. It is a happy sign that this attitude is fast dying out. In fine, team-work requires suppression of the self of its component parts, in the interest of the team, while those in charge of the investigation or the employers, should scrupulously avoid suppressing individualism of these parts. In the words of General Smuts, "The disappearance of the sturdy, independent-minded, freedom-loving individual and his replacement by a servile standard of mass-mentality is the greatest menace of our time."

These timely remarks coming from such an eminent authority, it is hoped, will not be lost sight of in the development of scientific and industrial research in this country, which is yet on its path to recognition in the scientific world.

"CHEMIST."

Academies and Societies.

Indian Academy of Sciences.

April 1935. SECTION A. T. S. SUBBARAYA: *Analysis of the Band Spectrum of Zinc*.—The analysis of Hg_2 , Cd_2 and Zn_2 bands given by the author removes many of the difficulties inherent in the previous explanation that each one of the band series is a single ν' progression. C. N. SRINIVASIENGAR: *Singular Solutions of Simultaneous Ordinary Differential Equations*. I. CHOWLA: *Some Problems of Waring's Type*. S. CHOWLA: *A Theorem on Sums of Powers with Applications to the Additive Theory of Numbers*. S. CHOWLA: *A Theorem on Sums of Powers with Applications to the Additive Theory of Numbers II*. T. SURYANARAYANA MURTY: *Note on Dirichlet's L-Functions*. D. S. SUBBARAMAIA: *On the Depolarisation of Tyndall Scattering in Colloids*.—The light incident on a system can be either unpolarised, or plane polarised with electric vector vertical, or plane polarised with electric vector horizontal. The inter-comparison of the corresponding values for depolarisation, ρ_u , ρ_v and ρ_h furnishes important information regarding the size and anisotropy of shape or structure of the scattering particles. R. S. KRISHNAN: *On the Depolarisation of Tyndall Scattering in Colloids*.—On the assumption that the law of distribution in direction of the orientation scattering by larger particles is the same as that for very small ellipsoidal particles, the following simple numerical relationship $\rho_u = (1 + 1/\rho_h) / (1 + 1/\rho_v)$ has been derived and found to be in satisfactory agreement with the observations reported in the previous paper. R. SAMUEL AND M. ZAKI-UD-DIN: *Note*

on the Absorption Spectrum of CaI.—The end absorption in the ultra-violet is the only real absorption of CaI molecule. There are no bands present. S. K. BANERJI: *Theory of Microseisms*.—Microseisms of a definite type are produced by the disturbance of pressure at the bed of the sea produced by storm waves in the mid-Arabian Sea and mid-Bay of Bengal. A theory of these microseisms has been worked out by introducing into the usual hydrodynamical equations terms involving compressibility, and the amplified theory gives a satisfactory explanation of all the observed facts. Various other causes which might also produce microseisms are discussed. AKSHAYANANDA BOSE: *The Weiss Constant of Paramagnetic Ions in the S-State. Part II. Aqueous Solutions of Ferric Salts*.—The product χT for aqueous solutions of ferric salts is appreciably less than the theoretical value. A study of these deviations, with respect to nature and concentration of salt, the acid content, and the temperature, indicates that the deviations might be due to the hydrolysis of the salts.

SECTION B. M. K. SUBRAMANIAM: *Preliminary Observations on the Effect of Fertilization on the Golgi bodies in the eggs of Acentrogobius neilli (Gobius neilli, Day)*.—On fertilisation the golgi elements below the zona enlarge and the rim of the fatty yolk droplets break up into irregular granules; concurrent with these changes the inner portions of the zona become converted into a mucilaginous envelope, after the completion of which, the majority of the golgi are extruded. H. CHAUDHURI: *A Bacterial Disease of Wheat in the Punjab*.—By means of successful inoculation