

SCIENCE NOTES AND NEWS

Nobel Prizes, 1939.—The following awards have been announced: *Physics*: Prof. Ernest Orland Lawrence (California University) for his discovery of cyclotrone. *Chemistry*: Prof. Butenandt (University of Berlin), Prof. Ruzicka (University of Zurich) and Prof. Kuhn (Heidelberg University).

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The Thickness of the Liquid-Vapour Interface of Pure Water.—McBain, Bacon and Bruce (*J. Chem. Phys.*, 1939, 7, 818) have described an apparatus for measuring the surface film thickness of less than a monomolecular order of magnitude. The method is based on the optical theory of Drude. The retardation in phase sustained by plane polarised light at a transparent reflecting surface is compensated and measured by tension on a thin microscope glass cover slip. Experiments with pure water give the lower limit of 2-3 Å for the thickness of the interfacial layer at the liquid-vapour interface of pure water.

K. S. G. D.

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Upper Air Study in Madras.—An account of average conditions of temperature, pressure and humidity prevailing in the upper atmosphere over Madras, as obtained from measurements extending over a period of four years, is now published (*Memoirs of the Indian Meteorological Dept.*, 1939, 27, Part 2). Being a coastal station, Madras is suited for this kind of work only in the season in which balloons let off from there will be carried westwards by the winds, *viz.*, the months June to November. The study of the upper air climatology of the same latitude in other months is possible only by having an auxiliary inland station, for which Bangalore has been selected and has been functioning, with the co-operation of the Government of Mysore, from last year. The results of Bangalore can be studied with advantage only a few years hence.

Some of the most interesting results obtained from the Madras data are that between the heights of one and ten miles in the upper atmosphere above the earth, the mean temperature over Madras shows every little change from month to month in the period June to November. In October mean temperatures between one and eight miles are practically the same throughout the north-south extent of India, at least along the central strip. In November, from two to eight miles, Poona is warmer than either Agra or Madras.

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Adulteration of Drugs in India.—Tests conducted recently by the *Biochemical Standardisation Laboratory*, Calcutta, on samples of various medicinal preparations of quinine including mixtures, powders, tablets, etc., have shown that nearly *seventy-five* per cent. of the quinine preparations in the Indian market are adulterated. Many of them contain percentages of quinine far below those required to produce

any therapeutic effect while some do not contain quinine at all. A number of cases of malaria which have been found to be "quinine resistant" have been reported. While it is certain that there are types of malaria which are resistant to quinine, it is very probable, in view of the findings of the *Biochemical Standardisation Laboratory*, that in many of these cases, the preparations used for treatment contained little or no quinine. Some time back, the *Biochemical Standardisation Laboratory* carried out similar tests on samples of digitalis preparations and found that most of them were far below the strength prescribed by the pharmacopœia. It can be safely asserted that the position is equally bad with regard to other drugs also. The incalculable harm done to the public by adulteration of foods and drugs has been pointed out again and again and the Government of India has been repeatedly urged to introduce effective legislation to prevent adulteration—but so far with very little effect. No Government which has the good of its people at heart can afford to let the present state of things to go on. The work on quinine preparations done by the *Biochemical Standardisation Laboratory* is only one more proof (if any proof were needed) of the urgent necessity for taking immediate measures to prevent adulteration of foods and drugs in India.

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Mineral Production in India.—The total value of ores, minerals and metals produced in India during 1938 is estimated by the Geological Survey of India at about Rs. 34,13,95,000 or £25,477,000 as against Rs. 30,49,43,000 or £22,928,000 in 1937. This represents an increase of nearly 12 per cent. and is largely due to the record production of coal—28,343,000 tons valued at Rs. 10,64,24,000 or £7,942,000 which exceeds the production of the previous year by over 35 per cent.

Of the other minerals, ores and metals, the production of steel has gone up slightly; pig iron production is also better, but with the fall in price there has been a decline in the production of manganese. Gold output is steady, petroleum has improved and so have building materials and salt, but mica has fallen appreciably and so has copper. Ferro-manganese has more than doubled in value, while in ilmenite, with increasing production, India is leading. Chromite has fallen in value, but monazite, gypsum and steatite have improved. Diamonds, graphite and felspar have improved as against barytes, bauxite, asbestos and tungsten-ore which have declined in value. In bauxite the fall in value is entirely due to the fall in price and not to any fall in quantity. The total values of apatite, beryl, garnet and sapphire production have all fallen greatly.

Occurrence is reported of antimony-ore (zinckenite) in Chitral; explorations are being continued for the discovery of tungsten-ore.

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Eradication of Kans.—The Imperial Council of Agricultural Research have sanctioned a two-year scheme of research for studying *Kans*, a noxious weed ruining thousands of acres of cultivated land in Central India, Bundelkhand and Central Provinces.

Once the weed gets established, especially in black cotton soils, there is no end to the damage. The cultivator is unable to plough it out with the ordinary plough. The weed spreads with ferocious rapidity.

The Bhopal Government purchased two of the heaviest agricultural tractors available in India at a cost of about Rs. 50,000 and spent an additional sum of Rs. 75,000 in ploughing *Kans* infested land to a depth of 10–12 inches. This method brought many a field under cultivation but it could not be regarded as a permanent solution of the problem.

At present scientific information on the life-cycle and root-system of the weed does not exist. Methods adopted in Central Provinces and Indore were found by the Bhopal Director of Agriculture to be helpful to a limited extent in bringing the weed under control but not in eradicating it. He also found that Mr. (now Sir) A. Howard and the late Mrs. Howard's method was too expensive for the cultivator.

In the working of the scheme, the Advisory Board has suggested that a study should be made of the work done on the subject in Central Provinces, Bombay and Indore.

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Recent Work at Rice Research Stations.—On account of the amazing diversity of soil and climate in India, the number of varieties of rice is immense, and the methods of cultivation vary considerably. At one end of the scale, there is deep water paddy such as grows in parts of Assam where the rice stem elongates as the flood water rises and may attain a length of eight feet. At the other, we have in Baroda and parts of Gujerat, rice grown purely as a rain-fed crop without any flooding and sometimes along with and in the same field as cotton. Obviously no single central station can tackle all the problems connected with rice.

The problem of producing suitable rices for export has been investigated at some places. In Bengal several crosses have been made to evolve high-yielding strains of rice conforming to the requirements of the export trade for Britain. A hybrid strain has been evolved which is close to the *American Blue Rose* in size and texture. An improved strain *Gosaba 23* is distributed in the regions where the quality of *Patnai* rice, a favourite export strain, is found deteriorating.

In addition to the obtaining of varieties with higher yields, plant-breeding work has been successful in providing strains which resist certain pests and diseases. The problem of saving the early rice crop in the United Provinces from the rice fly, *gundhi*, which by sucking the grain destroys the crop over extensive areas, has been handled by crossing prolific grained strains with a coarse grained and early poor yielding type known as *Sathi* which by virtue of a leaf covering the ear-head escapes the attacks. Hybrid strains immune to the fly

have now been bred. They are superior *Sathi* in yield and fineness of grain and earlier than the types under distribution.

In certain rice areas self-sown wild rice is a nuisance. To enable it to be recognised and pulled out at an early stage in the Central Provinces, strains have been evolved as a result of hybridisation, which are more prolific in yield and can be distinguished from wild rice by a distinctive colour in the early stages. The seeds of these hybrids have been distributed and have met with success.

To criticise programmes, to study results and to help in deciding policy, there is a standing Rice Committee of the *Imperial Council of Agricultural Research*, on which all interests are represented. The Committee not only coordinates research, but also makes sure that research is adapted to the needs of the cultivator and the trade.

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Vegetable Insecticides.—The Industrial Section of the *Indian Museum, Calcutta* (Botanical Survey of India) has recently acquired and placed on show specimens of *Derris* root, commercially known as Tuba root, and flowers and plants of *Pyrethrum*. The *Derris* root and *Pyrethrum* flowers are considered to be essential ingredients in insecticidal preparations used as dust or spray.

The *Derris* roots have been obtained from Assam, Bangalore and the Central Experimental Station at Serdang in the Federated Malay States, and the *Pyrethrum* plants and flowers from Kashmir and the Murree Hills of the Punjab. Some *Pyrethrum* flowers have also been received from Harpenden in the United Kingdom and Kenya. To make the exhibit attractive, pictures of the plant specimens drawn in their natural colours have been placed by their side.

More efficacious and less costly to produce than there has been in recent years a growing world demand for insecticides of vegetable origin which are comparatively harmless to human beings, to replace more dangerous arsenical and other chemical preparations.

Insecticidal preparations from *Derris* have been tried with success in Assam against biting and sucking insects and in Madras against caterpillars which damage the cabbage crops. In Bengal, too, a preparation has been tried as spray against mango leaf hopper and found efficacious, but the cost is reported to be high.

Attempts are being made to cultivate "Tuba" in several parts of India; the plant grown in Mysore, in particular, has been found to give a good yield of rotenone, the active principle on which depends the value of these products as insecticides.

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Electro-Magnetic Grain Cleaner.—The electro-magnetic seed cleaning is based on the observation that many wild seeds, particles of stubble and broken grain have a rougher surface as compared to that of good seeds. When the seeds are mixed with fine iron powder, the iron adheres to the rough surface and can be separated away from smooth-surfaced good grains by passing over magnetic cylinders. In

actual practice, steel dust is employed and a small quantity of liquid medium, either water or a mixture of castor and olive oils, is used to increase the adherence of the powder to the rough surface of the useless material.

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Biological Control in the Lac Industry.—Lac insects are subject to the attack of two classes of enemies, internal parasites and external parasites and external predators, whose control is a factor of major importance in the commercial production of lac. The practicability of biological control of these enemies is discussed in a paper by Glover and Gupta in a contribution published by them in a recent number of the *Indian Journal of Agricultural Science* (1939, 19, 523). According to these authors, predators constitute the more destructive agents affecting about 30–40 per cent. of lac cells. The emphatic statement that the damage done by parasites is small (4.8 per cent.) may be questioned by other experienced workers in the field, whose work as is customary with these authors, has been ignored. They refer to the “recently discovered egg parasites of lac predators” the practical demonstration of whose effectiveness will be awaited with keen interest.

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Indian Central Cotton Committee.—The *Annual Report* for the year ending 31st May 1939, which we have just received, provides an impressive record of service rendered to the Indian Cotton Industry. The spinning value of 635 samples of new cottons has been determined thus providing the various provincial agricultural departments, as well as others, with complete and authoritative reports on the spinning value of their products. Many samples of yarn, cloth and cotton were received for fibre tests as also some samples for moisture tests and dye absorption tests. In addition, tests on trade samples, samples from cotton mills and Indian standard cottons were carried out. Many of these tests are of a routine nature, such as the determination of tensile strength of cloth or yarn, determination of actual counts, number of turns per inch, reed and pick, etc., but some of the interesting features met with in the course of testing these samples are mentioned in the Report.

Several technological tests such as the effect of fibre weight on spinning quality of Indian cottons, effects of storage on the quality of Indian cottons, have been carried out and reported during the period under review, in the form of technological bulletins and circulars. For the interested public, two small brochures have also been issued from the Laboratory.

Summaries of technological bulletins as also a list of tests which may be carried out for the trade on payments are found in the Report.

It is gratifying that in about two years time, the number of samples received has increased by 50 per cent.; but the total number of samples received is not commensurate with the large volume of the industry. It is to be hoped that in the coming years, the cotton mills and firms will take greater and greater advantage of the facilities offered by this official testing house of the Indian Textile Industry.

P. S. S.

The League of Nations' World Economic Survey, 1938/39 (Ser. L.o.N. P., 1939, II A. 247 pages) was completed on the eve of the outbreak of hostilities in Europe. According to a communique issued by the Information Section, it covers events up to beginning of August 1939, and thus presents a picture of the world economic situation up to the date of the beginning of hostilities. During the first months of 1939 the world was making a rapid recovery from the major depression with which it had been threatened in the first half of 1938. This rapid reversal of economic conditions may be ascribed in part to financial measures taken in the United States of America and in other countries in order to stimulate the lagging demand for goods and services. But in the main it was due to increased expenditure on armaments and war preparations.

This issue—the eighth in the series—includes a number of special studies. One chapter, for example, is devoted to a study of the economic effects of recent changes in the trends of population.

A second chapter studies the problems of public finance, and examines the extent to which the costs of rearmament have eaten into the national incomes of various countries.

The concluding chapter, entitled “The Economic Effects of War, Rearmament and Territorial Changes” summarises the main theme of the volume. Economic destruction in Spain and China and the reduction in the standard of living in Japan as a result of war; the economic effects of the territorial expansion of Germany; and the greatly increased intervention of the State in economic affairs for the purposes of national defence;—these are the main subjects of the chapter. In various other chapters the growing importance of political tension and of rearmament is emphasised in their effects on economic activity, on world trade, on hours of work and the demand for labour, on budgetary and monetary policies, and on commercial relations between the nations.

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Business Cycles in the United States of America, 1919-1932.—The Economic Intelligence Service of the *League of Nations* has just published the second volume of the series “Statistical Testing of Business-cycle Theories” dealing with the business cycle in the United States of America from 1919 to 1932. According to a communique from the Information Section of the *League of Nations*, this volume applies the system of mathematical analysis described in the first volume to the post-War trade data of the United States. It aims at determining on the basis of existing statistics and with the help of the “multiple correlation method,” the more important quantitative relationships which have governed the economic system of the United States of America during the period under review. In this way, some forty equations are found, which are thought to represent the main characteristics of the mechanism of the United States business cycles in that period. The combination of these equations by mathematical treatment (“elimination process”) yields one “final” equation, from which

emerges the general nature of the United States cycle (cf. *Curr. Sci.*, 1939, 8, 192).

Scientific Expedition to Central Pacific.—The expedition sponsored by the *National Geographic Society and the University of Virginia with the U.S. Coast Guard co-operating* (cf. this *Journal*, 1939, 8, 391, 493), has been indefinitely postponed, owing to the outbreak of war in Europe. According to a communique issued by the *National Geographic Society*, the expedition was to have sailed from San Francisco on September 19 on the Coast Guard cutter *Hamilton*, but plans had to be shelved when the *Hamilton* was ordered to Atlantic waters as part of the coast patrol established by President Roosevelt to preserve American neutrality.

Tons of scientific equipment had been shipped to the Pacific Coast to be loaded on the *Hamilton*, and scientist members of the expedition had spent months of intensive work preparing apparatus for studying geology, magnetism of the earth, variations in gravity, earthquakes, marine biology, weather, ocean currents, and for collecting samples of the ocean bottom from great depths. The expedition was to have conducted the most extensive programme of scientific work ever attempted in the Pacific Islands region.

Most of the expedition's apparatus now is being shipped back to scientific laboratories, universities, and government agencies which supplied it. Some of the supplies will be stored for future use when the expedition can proceed, and perishable materials will be sold.

Prof. Wilbur A. Nelson, leader of the expedition, will return to his duties as Professor of Geology at the University of Virginia to await conditions better suited to scientific research on the high seas.

A Phytogeographic Map for India.—At the ordinary meeting of the *Royal Asiatic Society of Bengal* held on Monday, 6th November, Dr. D. Chatterjee presented a paper on his studies relating to the endemic flora of India and Burma. The author has traced the relationships of the various groups of Indian plants with those of the surrounding countries, and also discussed the nature of invasion of foreign plants into India. The author states, "In a continental area, it is unusual to find a high degree of endemism but 61.5 per cent. of Indian plants has been found to be endemic. A possible explanation based mainly on the theory of isolation has been put forward in the present case. The endemic species have been found in high concentration in three regions: (a) The Himalayas, (b) South India, and (c) Burma".

The following students of the *Imperial Agricultural Research Institute, New Delhi*, have been awarded the Diploma of the Institute (Assoc. I.A.R.I.) after the completion in 1939 of their two-year post-graduate courses and the acceptance by the Institute Council of theses submitted by them in the subjects noted against each:—

- (1) Atamaram Bhairav Joshi (Botany);
- (2) G. Suryanarayana Murti (Botany);
- (3)

- Ram Mohan Arora (Botany);
- (4) Sham Lal Juneja (Botany);
- (5) W. V. B. Sundara Rao (Agricultural Chemistry);
- (6) Abhiswar Sinha (Agricultural Chemistry);
- (7) Atam Prakash Kapur (Entomology);
- (8) Raghubir Sah Mathur (Mycology);
- and (9) S. Y. Padmanabhan (Mycology).

National Institute of Sciences of India.—The following gentlemen have been elected Fellows of the Institute:—*Ordinary Fellows*: (1) Dr. I. Banerjee, D.Sc., Reader in Physics, Dacca University. (2) Prof. F. R. Bharucha, B.A., B.Sc., D.Sc., Professor and Head of the Department of Botany, Royal Institute of Science, Bombay. (3) Dr. R. N. Ghosh, D.Sc., Reader in Physics, Allahabad University. (4) Prof. H. K. Mookerjee, D.Sc., D.I.C., University Professor and Head of the Department of Zoology, Calcutta University. (5) Prof. V. V. Narlikar, B.Sc. (Bom.), B.A. (Cantab.), F.R.A.S., Professor and Head of the Department of Mathematics, Benares Hindu University. (6) Dr. C. G. Pandit, M.B.B.S., Ph.D., D.P.H., D.T.M., Offg. Director, King Institute of Preventive Medicine, Guindy, Madras. (7) Major C. L. Parischa, I.M.S., Professor of Pathology and Bacteriology, School of Tropical Medicine, Calcutta. (8) Prof. L. Rama Rao, M.A., F.G.S., Professor of Geology, Mysore University. (9) Dr. M. Shariff, D.Sc., Ph.D., Entomologist, Haffkine Institute, Bombay. (10) Dr. K. Venkataraman, M.Sc. (Tech.), Ph.D., D.Sc., Director, Bombay University Laboratories of Chemical Technology and Textile Chemistry.

Honorary Fellows: (1) Dr. E. V. Appleton, M.A., D.Sc., F.R.S., Secretary, Department of Scientific and Industrial Research of Great Britain. (2) Prof. Charles W. Edmunds, A.B., M.D., Professor of Pharmacology and Therapeutics, University of Michigan Medical School, U.S.A. (3) Prof. R. A. Fisher, Sc.D., F.R.S., Galton Professor in the University of London. (4) Prof. Waldemar Lindgren, Emeritus Professor of Geology, Massachusetts Institute of Technology, Cambridge, Mass., U.S.A.

Herbert Akroyd Stuart Award, 1937-39.—Information has been received at Calcutta that Mr. S. N. Mukerji, M.Sc., A.M.I.E. (Ind.), a member of the Research Staff, *Government Test House, Alipore*, has been awarded the prize of £50 under the above award for his paper on "The Origin and Development of Heavy-Oil Engines". The award is provided under the will of the late Herbert Akroyd Stuart, a pioneer in the development of oil engines, bequeathed to the *Institute of Marine Engineers, London*, for the best paper by a member or non-member on the subject above referred to. The award is given every two years. The Awards Committee reported that the 'entries received on this occasion were of a very high standard of merit', and they have specially complimented Mr. Mukerji on his excellent essay. Owing to the difficulty of distance the requirement that the winning paper shall be read at a meeting of the Institute has been waived and the paper will be published in the November issue of the *Institute's Transactions*.

University of Mysore.—I. GENERAL: The Senate, the Academic Council and the University Council were reconstituted for a period of three years (1939-42). **II. CONVOCATION:** The Twenty-second Annual Convocation for conferring degrees was held on the 25th October 1939, His Highness the Chancellor presiding. Sir Nripendranath Sirkar, K.C.S.I., delivered the Convocation Address. **III. MEETING OF THE ACADEMIC COUNCIL:** The first ordinary meeting of the Academic Council was held on 8th September 1939. The propositions that were passed at the meeting of the Academic Council held on the 8th September 1939 included—one relating to the institution of course of study in Chemical Engineering, and another relating to the institution of French and Latin as second languages which may be offered at a University Examination provided satisfactory arrangement for instruction is made by the candidates themselves. **IV. LECTURES:** The Sri Krishnarajendra Silver Jubilee Lecture of a previous year was delivered by Sir T. Vijayaraghavacharya, K.B.E., at Bangalore on the 1st September and that for the current year by Sir Alladi Krishnaswami Aiyar on 30th September 1939, the subjects being "Scientific Research in Agriculture" and "Law as an Instrument and Measure of Social Progress" respectively. **V. EXAMINATION:** The results of the L.M.P. Examinations held in October 1939 were published. They were as follows:—

	Number	
	Examined	Passed
First L.M.P.	.. 14	7
Second L.M.P.	.. 25	14
Third L.M.P.	.. 40	19
Final L.M.P.	.. 43	18

Announcements

The 11th Session of the Indian Mathematical Conference will be held at Hyderabad under the auspices of the Osmania University from 21st to 23rd December 1939. Apart from the reading of papers, two Symposia will be held on (1) "Generalised Geometry, including Relativity and Field Theory", and on (2) "Warring's Problem". A discussion on the Teaching of Mathematics in Schools and Colleges will also be held. Three public lectures will be delivered, the subjects being (1) Meteoric Astronomy; (2) Mathematical Recreations; and (3) Mathematics, the Handmaid of Arts, Science and Economics.

Excursions, specially to the famous Ellora and Ajanta Caves, are also being arranged.

Those who wish to attend the Conference can communicate with the Local Secretary, Department of Mathematics, Osmania University, Lalaguda, Hyderabad (Deccan).

All-India Sugar Conference.—The Government of India have decided to convene an All-India Sugar Conference representing all interests, at an early date. It will consider measures for the rationalisation and stabilisation of the sugar industry.

Items such as the regulation of cane production, payment of premium for special varieties

of cane, legislation for zoning, licensing of factories, establishment of industries subsidiary to sugar and of a central marketing organisation, etc., have been recommended by the Sugar Committee and the Advisory Board of the *Imperial Council of Agricultural Research*. These items will be referred to the proposed All-India Sugar Conference.

Science Progress.—The Editors and Publishers (Messrs. Edward Arnold & Co.) of this well-known quarterly review, founded by Sir Ronald Ross in 1907, announce with regret that the October number will be the last to appear for the present. The purpose of the review is to record recent advances in pure science and to publish articles by those who have played a leading part in such work. Research of this kind is bound to be seriously diminished in war-time, and therefore it has been reluctantly decided to suspend publication until conditions are more favourable.

An article by Sir Arthur Eddington on "The Cosmological Controversy" is a notable feature of the October number.

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We acknowledge with thanks receipt of the following:—

"Journal of Agricultural Research," Vol. 59, No. 3.

"Agriculture and Live-Stock in India," Vol. 9, Pt. 5.

"The Philippine Agriculturist," Vol. 28, No. 5.

"Monthly Bulletin of Agricultural Science and Practice," Vol. 30, No. 9.

"L'Agricoltura Coloniale," Vol. 33, No. 7.

"Biochemical Journal," Vol. 33, No. 8.

"Contributions from Boyce Thompson Institute," Vol. 10, No. 4.

"Journal of Chemical Physics," Vol. 7, No. 9.

"Comptes Rendus," (DOKLADY), Vol. 24, Nos. 3-4.

"Experiment Station Record," Vol. 81, No. 3.

"Indian Forester," Vol. 65, No. 11.

"Forschungen und Fortschritte," Vol. 15, No. 23/24.

"Genetics," Vol. 24, No. 5.

"Review of Applied Mycology," Vol. 18, No. 9.

"Calcutta Medical Journal," Vol. 36, No. 4.

"The Mathematics Student," Vol. 7, No. 2.

"The Bulletin of the American Meteorological Society," Vol. 20, No. 7.

"Journal of the Indian Mathematical Society," Vol. 3, No. 7.

"Indian Medical Gazette," Vol. 74, No. 10.

"Nature," Vol. 145, No. 3646.

"American Museum of Natural History," Vol. 44, No. 2.

"Proceedings, Royal Netherlands Academy," Amsterdam, Vol. 42, No. 6.

"Indian Journal of Physics," Vol. 13, No. 4.

"Sky," Vol. 3, No. 11.

"Indian Trade Journal," Vol. 135, Nos. 1738, 1740-41.

"Indian Journal of Veterinary Science and Animal Husbandry," Vol. 9, Pt. III,