

## SCIENCE NOTES AND NEWS

**Photo-Fission of Uranium and Thorium.**—Hahn and Strassmann's discovery of the neutron-induced fission of uranium atoms resulting in two fragments of nearly equal masses early in 1939 was quite a sensational piece of scientific news. Scientists were therefore well prepared in 1940 for the preliminary announcement from the Westinghouse Research Laboratories, East Pittsburgh, Pennsylvania, that uranium and thorium atoms behaved similarly under the influence of energetic  $\gamma$ -rays. The discoverers of this phenomenon of photo-fission, R. O. Haxby, W. E. Shoupp, W. E. Stephens and W. H. Wells have recently (*Phys. Rev.*, 1941, 59, 57) given a fuller account of their findings. High energy protons (2–3 Mev.) from the Westinghouse electrostatic generator were, after magnetic analysis, directed on to a  $\text{CaF}_2$  target in a Faraday cage. The bombardment of fluorine gave rise of  $\gamma$ -radiation of the required energy (about 5 Mev.), which in turn irradiated a 12  $\text{cm}^2$  piece of uranium metal, placed on the high voltage plate of the ionisation chamber. The authors have thereby measured the cross-sections for the photo-fission of uranium as well as thorium and find that

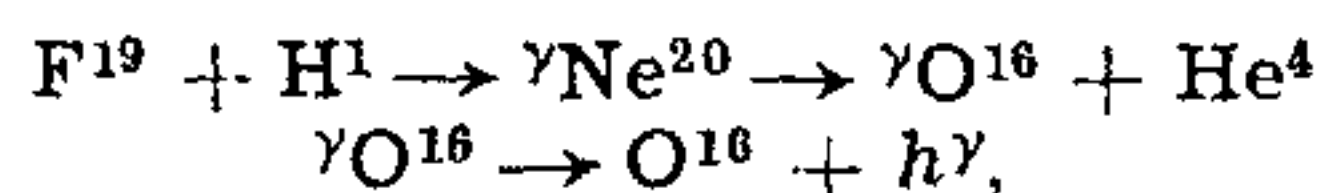
$$\sigma_U = 3.5 \times 10^{-27} \text{ cm}^2 \text{ and} \\ \sigma_{\text{Th}} = 1.7 \times 10^{-27} \text{ cm}^2,$$

with a probable error of about 30 per cent. The fission of the heavy nucleus is thus not a frequent happening. The chance that one quantum of  $\gamma$ -rays per  $\text{cm}^2$  will cause the fission of one atom of uranium is  $3.5 \times 10^{-27}$ . Under comparable circumstances, the cross-section of the uranium atom for fission by slow neutrons would be about  $3 \times 10^{-24} \text{ cm}^2$ . Thus the neutron-induced fission is roughly 1,000 times as probable as the photo-fission. These recent experimental values for the cross-sections in photo-fission agree well with the theoretical estimates by Bohr and Wheeler.

L. S.

**Electrostatic Generator and Transmutation of Fluorine.**—In the February issue of the *Physical Review* (1941, 59, 241) Tom Lauritsen, C. C. Lauritsen and W. A. Fowler have published the details of construction of a pressure electrostatic generator that they have erected in the Kellogg Radiation Laboratory of the California Institute of Technology, Pasadena. A brief review of the details of this generator with the diagrams (reproduced by permission) has been attempted in the columns of *Current Science* (1941, 10, 124) by C. K. Sundarachar, J. F. Streib and B. V. Raghavendra Rao. Complete details regarding the design of the generator, the high potential electrode, the pressure vessel, the supporting and insulating columns, the charging system, the ion source and the accelerating tube are now directly available from the Kellogg Laboratory for those interested in the construction of a similar generator in India. The dependence of the terminal voltage on the charging current as

well as the relation between the maximum operating voltage and the tank pressure have been studied. The performance of this generator which operates at 1.7 Mv. in a cylindrical tank of over-all length 13'6" and diameter 8' at a pressure of 80 lb. per square inch is discussed. The transmutation of fluorine by protons accelerated to high velocities by the generator has been examined by J. F. Streib, W. A. Fowler and C. C. Lauritsen (*Phys. Rev.*, 1941, 59, 253). The origin of the  $\gamma$ -rays given off when fluorine is bombarded by fast protons is traced to the reaction



where the superscript  $\gamma$  refers to states of  $\text{Ne}^{20}$  or  $\text{O}^{16}$  involved in the production of the 6.2 Mev.  $\gamma$ -radiation. The  $\gamma$ -radiation has been shown to exhibit resonance at proton bombarding energies of 0.334, 0.479, 0.589, 0.660, 0.862, 0.927, 1.335 and 1.363 Mev. thereby leading to a discussion of the nuclear energy levels of the intermediate products; the emission of the short-range  $\alpha$ -particles has been definitely established.

L. S.

**The Growth and Food of Young Salmon.**—An account of the growth of Salmon based on observational data in 220 Salmon smolts and parr captured during a period of 8½ years has recently been published by Went (*Proc. Roy. Irish Acad.*, 1940, 46 B, 53). Of the specimens collected, males comprised 62.8 per cent. and of these, 46.5 per cent. were sexually mature. Some smolts of the two-year class which showed signs of rapid growth migrated first, showing that the migration of smolts depends on some physiological condition which is associated with the attainment of a minimum size. The Salmon grew less rapidly than the brown trout and the scales indicated that the "Summer" or rapid growth was from April to end of July. Careful observations have revealed that it would be impossible to use the scale method for determining the proportion of sexually mature fry or to say from the adult scales whether the male had spawned during its parr life.

In the same paper, Frost has reported on the food contents of 192 Salmon parr and smolts ranging in length from 9 to 18.5 cm. Different age groups showed no significant differences except that the larger Salmon ate winged Ephemeroptera. As the trout feeds mostly on aquatic insect larvæ the author suggests that in the River Liffey the competition for food between the Salmon and trout will chiefly be for these larvæ.

R. G.

**The Marketing of Potatoes in India.**—The report on the marketing of potatoes in India recently issued by the Agricultural Marketing Adviser to the Government of India maintains the high standard of thoroughness which we are now accustomed to associate with these marketing surveys and reports. It deals with



the subject on the comprehensive plan which has now been standardised for these reports, all the main aspects of supply, demand and distribution being fully examined and reported upon and suitable recommendations for improvement under all heads also made. The total annual production of potatoes in India is reported to be 491 lakhs of maunds worth about nine and a half crores of rupees. There is in addition an import of 11½ lakhs of maunds worth over Rs. 33 lakhs. The area estimated as 448,000 acres is concentrated in the United Provinces, Bihar, Bengal and Assam, which together account for 80 per cent. of the acreage. About 90 per cent. is grown in the plains and the remainder on the hills; the former being mainly a winter grown crop and the latter summer grown. One of the most important problems is that relating to the storage of the produce over some months for its sale as table potatoes and as seed. The loss in the present methods of storage and handling is enormous and its money value is estimated at over a crore and a half of rupees. Prices at harvest time are only Rs. 1-8 to Rs. 2-8 a maund but they soar to Rs. 5 to Rs. 14 per maund after six months—a fact which shows the advantage of storage and the need for preventing the deterioration and loss. Much of the imports are for seed purposes and the high price of seed imported or locally grown and stored as compared with the price of ordinary produce is one of the heavy handicaps to potato cultivation. The subject of storage methods including cold storage is gone into as fully as its importance deserves. Railway transport charges are said to be very high and the use of the ordinary steel waggons leads to damage in transport; a reduction in the tariff of charges and the substitution of wooden vans for steel ones are suggested. The formation of co-operative societies of growers for the joint purchase of seed, and for looking after the financial and other needs of the members is recommended. Regulated markets, standardisation of weights and measures and the grading of potatoes according to sizes, shapes, colour and quality as well the use of standard forms of packages, and finally, on the side of research, the production of varieties with better keeping qualities, shorter periods of growth and of dormancy, disease-resistant and high yielding are among the many other useful recommendations.

A. K. Y.

**Flora of the Punjab Plains.**—An account of the Flora of the Punjab Plains and the Associated Hill Regions has been recently published by Dr. T. S. Sabnis (*J. Bombay Nat. Hist. Soc.*, 1940, 42, 124-49). In preparing this compilation, the author has obtained much useful information from the published papers of previous workers on the floras of the Punjab and from an examination of the collections in the Herbarium of the Forest Research Institute, Dehra Dun. The contribution refers only to a part of the flora of the Punjab plains and associated hill regions. According to Dr. Sabnis, the Punjab flora "represents 118 families which include 530 genera and 949 species" while

actually the number of families, genera and species listed in the paper are 39, 105 and 189 respectively. The reason for this discrepancy is not clear. Further in numbering the families, No. 13 has been missed so that the total number of families described is 38 and not 39. Dr. Sabnis's contribution on the flora of the Punjab plains, etc., is incomplete in that such important families of the dicotylednæ as Compositæ, Convolvulaceæ, Acanthaceæ, Euphorbiaceæ and others are omitted. Not a single monocotyledonous family is included. We trust that this discrepancy will be made up by the publication of a supplementary list.

L.S.S.K.

**Indian Vegetable Oils as Fuels for Diesel Engines.**—The annual production of vegetable oils in India is about eight million tons. Although at present the market prices of vegetable oils are in general higher than that of mineral Diesel oils, in certain localities, particularly the non-edible oils are available at fairly cheap rates, and it is quite probable that at a not too distant future, the relative prices of the vegetable and mineral oils may be reversed. It is therefore of great national importance to investigate the utilisation of vegetable oils as Diesel engine fuels. The results obtained by the Indian Research Bureau indicate that most of the vegetable oils may be successfully employed as Diesel fuels (*Bull. Ind. Res. Bureau*, 1940, No. 19. By H. D. Chowdhury, S. N. Mukherji, J. S. Agarwal and Lal C. Verman). Some do not require any modification in the engine except minor adjustments; such oils include groundnut oil, cotton seed oil, and rape seed oil. Cotton seed oil gives an exceptional performance in that its consumption is definitely less than that of mineral oils, and its efficiency appreciably higher, while the power output is equal to that obtained in the case of mineral oil.

**The Indian Glass Industry.**—With an annual production valued at Rs. 2,00,00,00,000 India's 101 glass factories are now able to meet national requirements to the extent of over 50 per cent. of the annual consumption. This figure may rise rapidly as further results of industrial research are made available to the industry.

The Board of Scientific and Industrial Research is further considering improvements in the furnaces designed at the suggestion of the former Industrial Research Bureau. As a result of stimulus given by the Bureau, a number of firms began to manufacture and market China glass. The possibilities of manufacturing liquid gold were indicated in a Bulletin of the Bureau (*Bull. No. 17*).

Good neutral glass is now being manufactured in Calcutta and satisfactory laboratoryware is now being produced. The requirements of the pharmaceutical industry and the medical services would soon be met by the glass produced in the Indian factories.

With the introduction of modern methods, new lines of manufacture are now open, such as beads, false pearls, ornamental glass plates, lampware, phials and tableware. The Glass and Refractories Committee of the Board of Scientific and Industrial Research is investigating the



production of optical glass and already certain samples have been prepared which have been reported to be fairly satisfactory especially for making binoculars and lenses.

**Archaeological Survey of India.**—In the field of exploration the most important discovery was that of a colossal temple with multiple terraces and angles datable to the early centuries of the Christian era at Lauriya Nandangarh in Bihar, says the *Annual Report of the Archaeological Survey of India for the year 1936-37* just published. This temple is the earliest prototype of the architecture of Burma, Java and Siam. The work was carried out by the late Mr. N. G. Majumdar, whose premature death has deprived Indian archæology of a devoted explorer.

A number of ruins were also explored in the jungles of Assam, which still hold some surprises for the archæologist.

During the year under report the Gol Gumbaz at Bijapur, the biggest dome in India, was reconditioned and special repairs to Taj Mahal at Agra, the Imambara of Asaf-ud-Daula at Lucknow and the ancient Buddhist ruins at Sarnath near Benares were carried out.

In the epigraphical branch the most important discovery is that of the earliest inscriptions found with three Barhmi inscriptions from Kosam, ancient Kausambi in the Allahabad District, one of which dates from the second Century B.C. Much material was collected in Central India, Rajputana and South India. A specially important feature of this year's collection is the discovery of a number of copper-plate records which throw interesting light on the history of early and mediæval India.

In the field of Museums, great improvements were recorded in the acquisition and re-arrangement of departmental museums. A detailed scheme whereby a number of museums in all Provinces throughout the country should benefit by receiving duplicate representative sets from Mohenjodaro was launched during the year. This work has been steadily going on and is much appreciated by the authorities in charge of the Provincial Museums.

**Botanical Survey of India.**—The collection and dissemination of all available information regarding several plants of economic importance; a thorough study of the possibilities of cultivating ipecac; the development of the tung-oil industry and the use of water-chestnut as a food product are among the activities referred to in the *Annual Report of the Botanical Survey of India for the year 1939-40*.

Nearly 3,500 specimens were identified and revised during the year; of these about 800 plants belonged to the Forest Research Institute, Dehra Dun, and 702 Burmese specimens were received from Dr. E. D. Merrill of Harvard University, U.S.A. The rest were sent by various Government Departments and educational institutions and private workers in India and abroad.

A large number of exhibits has been added to the already rich collection of specimens in the public gallery of the Industrial Section of the Indian Museum. Among them are Indian

silk products, industrial oils and oilseeds, food products, plant specimens of reputed insecticidal properties, hand-made paper exhibits and medicinal plant products.

Both the Herbarium and the Library have been enriched by new collections and acquisitions of suitable literature.

Workers in universities and other institutions both in India and abroad were supplied with different plant materials for their research work and the results obtained were in most cases communicated and recorded.

Correspondents, mainly from the commercial public, were supplied with information on the sources and supply of economic plant products, such as fibre, resins, tanning materials, varnish oil, vegetable dyes, insecticides and medicinal plants.

**Imperial Veterinary Research Institute.**—The *Annual Report for the year 1939-40* issued during this month draws attention to the expanding activities of this institution, which not only provides facilities for research in veterinary science but also provides instruction to post-graduate students in advanced animal husbandry including poultry husbandry. Arrangements have been made to set up a central museum at Izatnagar with a view to give the visitors a scientific insight into the field now covered by veterinary science. It is also proposed to establish a Wool Research Laboratory and a laboratory for investigating problems connected with hides and skins.

The Poultry Research Section of the Institute at Izatnagar has been the central agency for promoting interest in poultry farming by research, advisory work and instruction to students. In this section, long-term breeding and nutrition experiments have been started. Of the poultry diseases studied, mention may be made of Fowl *spirochaetosis* and infection with *Sp. anserina*. Birds infected with the latter, have been successfully treated with atoxyl.

In the Animal Nutrition Section surveys of animal nutrition in villages have been conducted. The examination of cattle feeds suitable for famine areas and experiments on the drying of grass, etc., are being carried out. The study of the more common cattle diseases including rinderpest was continued. It was observed that the vitamin C content of tissues of animals was greatly reduced in certain diseases like rinderpest, worm infection (in horses), etc. As farm animals are known to be capable of securing their own vitamin C requirements, independent of the diet, this observation is of particular interest. The problem is being investigated in detail.

The spore-vaccine issued by the Institute for the treatment of anthrax has proved very successful; animals treated with the vaccine proved immune for at least 18 months.

**Industrial Research Bureau: Annual Report, 1939-40.**—The achievements of the Industrial Research Council, the Industrial Research Bureau, and the Research Branch of the Government Test House, Alipore, are briefly summarised in this report. We notice that the



Industrial Intelligence Service is being increasingly availed of, and is forming a very useful activity of the Industrial Research Bureau. The principal subjects of research of the Research Branch of the Government Test House have been the improvement of paints, manufacture of dry cells, and the utilisation of Indian vegetable oils as lubricants and as fuels in internal combustion engines. Brief accounts of the progress in these as well as in a number of other subjects are given in Chapter III.

**Department of Industries, Bombay.**—The Annual Report for the year 1939-40 (obtainable from the Superintendent, Government Printing and Stationery, Bombay, price As. 5), indicates that the new industrial joint-stock companies floated during the year under review involve a capital of nearly Rs. 340 lakhs. Among them is a new factory for the manufacture of starch from maize with a capital of Rs. 25 lakhs, under construction in Ahmedabad. This factory also proposes to manufacture glucose, dextrine, chemical starch, gluten, food maize, germ oil, etc. It is also interesting to note that a leading American firm has invested Rs. 75 lakhs for the manufacture of car and cycle tyres, using Indian raw materials.

The Department has, as usual, vigorously helped in the solution of practical difficulties encountered in the process of manufacturing and marketing the goods of a variety of Industries in the Province, and has conducted experimental industrial work and practical demonstrations for the benefit of small-scale and cottage industries.

**Prince of Wales Museum of Western India.**—The Annual Report for the year 1939-40 just issued, records the activities of the Art, Archaeological and Natural History Sections of this most important National institution. Several improvements have been effected in all the sections with a view to render the Museum more useful both for public instruction and research.

In consultation with expert opinion the Trustees took all necessary precautions for protecting the most valuable exhibits from possible war damage. With a view to establishing a closer co-operation between the Museum and general public and schools, it is proposed to appoint guide lecturers.

In the exhibition of arms and costumes a new and attractive feature has been introduced in the Art Section on the model of the Folk Museums of Scandinavia. Models of Mughal and Maratha officers and soldiers have been prepared in the Art Section, and are being equipped with offensive and defensive weapons of the seventeenth century and dressed with the costumes of the period. In the Natural History Section numerous models illustrating the structure of reptiles have been prepared and suitably exhibited.

Post-graduate students of the Deccan College Research Institute and other scholars were given full facilities for the study of the exhibits in the Prehistoric and Brahmanical galleries of the Archaeological Section. In the Natural History Section the work of cataloguing and

arranging the research collections was continued and the reference collections of reptiles and fishes were made available to Drs. Malcolm Smith and S. L. Hora, who are now engaged on a revision of the Fauna of British India (Reptiles and Fishes).

**Pasteur Institute of Southern India, Coonoor.**—The Annual Report of the Director for the year 1939-40 which was issued early this year, gives an account of the rapidly expanding activities of this Institute. In addition to the usual routine work, much valuable research on rabies was carried out. A notable achievement is the preparation of a clear vaccine of high immunising value obtained by the iso-electric precipitation of a large quantity of inert protein accompanying the phenol-vaccine now in use. The preparation was relatively non-toxic.

A research unit known as the Protozoal Parasites Enquiry was attached to the Pasteur Institute, Coonoor, at the end of 1938. This unit is entirely financed by the Indian Research Fund Association. The activities of this section include, the study of the mechanism of defence against malaria, the study of antibodies in the spleen and the peripheral blood of immune monkeys, and large-scale experiments with sporozoites of *P. gallinaceum* (undertaken in collaboration with the Malaria Investigations of the International Health Division of the Rockefeller Foundation working at the Pasteur Institute, Coonoor). Several new species of protozoal parasites have been encountered during the progress of the enquiry. A hitherto undescribed species of *Plasmodium* has been observed in the blood of Malabar squirrels but all attempts to transmit this parasite to other animals by blood inoculation, or to obtain a suitable insect vector, have so far failed. This work has received special attention since it is highly desirable to procure a malarial infection in some small laboratory animal. A trypanosome infection has also been discovered in the blood of the Malabar squirrel. Natural infection with a malaria parasite believed to be *P. inui* has been found in the blood of a young specimen of *S. sinicus* originating in the foothill jungles within 15 miles of Coonoor. This is the first record of this parasite in India.

Other independent units working in the Pasteur Institute are: Nutrition Research Laboratories (financed by the Indian Research Fund Association), Malaria Investigations (financed by the International Health Division of the Rockefeller Foundation) and Plague Enquiry in the Nilgiri District. The Pasteur Institute has recently carried out successful experiments on the preparation of precipitin sera for human and ox blood, as there is a considerable demand in the East for such high titre precipitin sera for the detection of blood meals taken by mosquitoes.

With a view to revive industries on vegetable dyes the Board of Scientific and Industrial Research has set up an exploratory committee on vegetable dyes.

As a result of the encouragement given by the Board, much useful work has already been



carried out. Work on the dyes from Kamala flowers, for use as edible colouring materials, has been completed at the H. B. Technological Institute, Cawnpore. The possibility of producing dyes from myrobalans is being studied under the auspices of the Mysore University. Experiments have been completed at the Government Textile Institute, Madras, on some natural dye-yielding products of indigenous growth, the use of which was in vogue prior to the advent of synthetic dyes. The process of extraction of the colouring matter has been standardised and recipes for several shades for use with cotton, silk and wool have been drawn up.

The American Academy of Arts and Sciences has awarded the Amory Fund of nearly \$16,000 to four investigators in consideration of their outstanding contributions to the treatment and cure of diseases of the genito-urinary system. The name of the three American recipients, announced in *Science* are: Dr. Joseph F. McCarthy, Dr. Carl Richard Moore, and Dr. Hugh H. Young. The name of the fourth recipient, who is in Europe has not been made public and his prize will be held by the Academy in trust.

The Amory Fund was established in 1912. The income for the Fund is devoted to the award of a septennial prize and the prizes just awarded are the first awards from the Fund and cover the contributions made since 1933.

The Katherine Berkan Judd Prizes of \$1,000 have been awarded to Drs. E. L. Kennaway and J. W. Cook of the Royal Cancer Hospital, London, for "outstanding contributions to knowledge of the cause and cure of Cancer" for the years 1939 and 1940. Dr. Kennaway isolated dibenzanthracene in crystalline form

from coal tar and showed that it was active on all animals in the causation of cancer. The structural formula of the causative agent was worked out by Dr. Cook.

**Imperial Agricultural Research Institute.**—The Diploma of the Institute (Assoc. I.A.R.I.) has been awarded to Mr. P. R. Bhagwagar, M.Sc. (Alld.), after the completion of two-year post-graduate course in Mycology and Plant Pathology, and in consideration of his thesis entitled: Part I—*Review of Fungicides in India* (including Burma and Ceylon). Part II—*Studies in Fusarium Wilt and Seed-rot of Gram* (*Cicer arietinum* L.) in India. Part III—*Alternaria Species on Potato in India*.

**Andhra University.**—The Honorary Degree of *Doctor of Science* has been conferred on Rao Bahadur T. S. Venkataraman, Imperial Sugarcane Expert, Coimbatore, and on Prof. S. Bhagavantam, Professor of Physics, Andhra University, Waltair.

The Executive Council of the Lucknow University, at their meeting held on April 18, unanimously elected Kunwar Sir Maharaj Singh, Vice-Chancellor of the University. Sir Maharaj Singh will take over charge of the office on July 16.

#### SEISMOLOGICAL NOTES

During the month of April 1941 one great, five moderate and four slight earthquake shocks were recorded by the Colaba seismographs as against three moderate and two slight ones recorded during the same month in 1940. Details for April 1941 are given in the following table:—

Date	Intensity of the shock	Time of origin I. S. T.		Epicentral distance from Bombay	Co-ordinates of the epicentre (tentative)	Depth of Focus	Remarks
April 1941		H.	M.	(Miles)		(Miles)	
1	Moderate	16	11	6890	Epc: Near lat. 15° N., and long. 92° W., to the south-east border of Mexico		
3	Moderate	20	59	5210			
15	Slight	01	03	1210			
16	Great	00	40	9840			
18	Slight	10	53	3090	Epc: Near lat. 40° N., long. 97°·5 E. in the neighbourhood of Su-chow in Kan-Su, China		
18	Moderate	18	55	3090			
19	Moderate	13	24	2010			
20	Moderate	23	09	1420	Epc: Near lat. 39°·7 N., long. 75° E., near Kashgar in Sin-kiang, China		
27	Slight	04	41	1490			
30	Slight	15	16	4290			



### ASTRONOMICAL NOTES

The Sun will be at the summer solstice on June 22, when it reaches its most northerly position.

Planets during June 1941.—Both Mercury and Venus will be low down in the western sky at sunset; the former attains its greatest apparent distance from the Sun ( $23^{\circ} 47' E.$ ) on June 6 and can be easily seen as a reddish star of magnitude 0.6 during the first half of the month. Mars is in quadrature with the Sun on June 2. It is in the constellation Aquarius and will be visible as a red star very near the meridian at sunrise. Its stellar magnitude at the end of the month will be  $-0.4$ . The three planets, Jupiter, Saturn and Uranus, are all morning stars rising only a short while before the Sun and are not favourably situated for observation.

Omicron Ceti (Mira).—The next maximum brightness of this interesting variable is expected to occur about June 25, when the star is likely to be of the second magnitude. The position is R.A.  $2^h 16^m$ , Declination  $3^{\circ} 15' S.$  It is one of the best known of the long period variables, the range of variation being nearly eight magnitudes and period 331.8 days. The star is of a deep red colour, and at maximum, can be easily located as a bright second magnitude star a little to the south-west of the stars  $\alpha$  and  $\gamma$  Ceti.

T. P. B.

### ACKNOWLEDGEMENTS

We acknowledge with thanks the receipt of the following:—

"Journal of the Royal Society of Arts," Vol. 89, Nos. 4579 and 4581.

"Journal of Agricultural Research," Vol. 61, Nos. 9-11.

"Agricultural Gazette of New South Wales," Vol. 52, Part 3.

"Contributions from Boyce Thompson Institute," Vol. 11, No. 6.

"The Journal of Chemical Physics," Vol. 9, No. 3.

"Journal of the Indian Chemical Society," Vol. 18, No. 1.

"Experiment Station Record," Vol. 84, Nos. 2-3.

"Indian Forester," Vol. 67, No. 5.

"Transactions of the Faraday Society," Vol. 37, Parts 1 and 2.

"Indian Farming," Vol. 2, No. 4.

"Geological, Mining and Metallurgical Society of India" (Journal), Vol. 12, No. 3.

"The Hyderabad Academy Studies," No. 2 (1940).

"Indian Central Jute Committee" (Bulletin), Vol. 4, No. 1.

"Bulletin of the American Meteorological Society," Vol. 22, No. 1.

"The Indian Medical Gazette," Vol. 76, No. 4.

"Journal of Nutrition," Vol. 21, No. 3.

"American Museum of Natural History," Vol. 47, No. 3.

"Nature," Vol. 147, Nos. 3716-18, 3720, 3721 and 3724.

"Indian Journal of Physics," Vol. 16, Part 6.

"Journal of Research" (National Bureau of Standards), Vol. 26, Nos. 1-2.

"Sky," Vol. 5, No. 6.

"Science and Culture," Vol. 6, No. 11.

"Sankhya," Vol. 5, No. 2.

"Indian Trade Journal," Vol. 140, Nos. 1816-20.

### BOOKS

"The Chemical Action of Ultra-Violet Rays," by Carleton Ellis and Alfred A. Wells. (Reinhold Publishing Co., N.Y.), 1941. Pp. 961. Price \$12.00.

"Handbook of Economic Entomology for South India," by T. V. Ramakrishna Iyer. (Government Press, Madras), 1940. Pp. xviii + 528. Price Rs. 4-12.

"Canning Practice and Control," by Osman Jones and T. W. Jones. (Chapman & Hall, Ltd., London), 1941. Pp. xiv + 300. Price 32s.

## ACADEMIES AND SOCIETIES

### Indian Academy of Sciences: (Proceedings)

April 1941, SECTION A.—H. J. BHABHA: Note on the correspondence between the classical and quantum theories of neutral mesons. K. RANGANATHA RAO AND T. R. SESHADRI: Synthesis of 7-hydroxy-5-methylcoumarin. R. VENKATARAMAN: The kinetics of the olefin-bromine reaction. Part III. A note on the influence of different catalysts on the reaction. P. BHASKARA RAMA MURTI: A study of the chemical components of the roots of *Decalepis Hamiltonii* (Makali Veru). Part II. A note on the preparation of inositol by solvent extraction. S. BHAGAVANTAM AND J. BHIMASENACHAR: Modified reflection of X-rays: Naphthalene. Modified X-ray reflections due to (001), (002), and (201) planes of naphthalene have been record-

ed only when the crystal setting is very near that of the critical setting in each case. For orientations which differ appreciably from the above settings, the intensity of the modified spots appears to be very low. R. V. BHAT: Adaptation of the micro-Kjeldahl method to the estimation of nitrogen in organic compounds containing nitro and azo groups. (LATE) N. W. HIRWE AND B. V. PATIL: Studies in chloral amides. Part VII. Reactivity of the  $\alpha$ -OH group in chloral bromo salicylamides and their methyl ethers. (LATE) N. W. HIRWE AND J. S. DESHPANDE: Studies in chloral amides. Part VIII. Condensation of toluic amides with chloral. (LATE) N. W. HIRWE AND J. S. DESHPANDE: Studies in chloral amides. Part IX. Reactivity of  $\alpha$ -chlorine in  $\alpha$ -chloro-chloral toluic amides. K. G. KRISHNAN: Dispersion of ultrasonic velocity in organic liquids. With seventeen organic liquids over the range 3500 kc to 8000 kc no