

## SCIENCE NOTES AND NEWS

**A Hymenopterous Parasite.**—*Probaryconus indicus* (Kieff.) recorded for the first time from India.

Mr. P. V. Isaac, Imperial Agricultural Research Institute, New Delhi, writes:—

While examining sugarcane for insect pests at the Agricultural College Farm, Poona, during April 1941, a few leaves with midribs having reddish-brown irregular patches on the upper surface were noticed. On splitting open such patches, grubs of a hymenopteron were found inside a smooth cell. These grubs pupated inside the cell as naked pupæ. The adult wasps emerged out through holes on the under-surface.

The specimens are found to be *Probaryconus indicus* (Kieff.), not so far recorded from India. It was originally described by Kieffer (*J.J. Zeitschr. Hymen. Dipt.* VII, 1907, p. 311) from Java. No host of this parasite is mentioned by him. No other information is available about this insect. The group of parasites to which this belongs, the Proctotrypoidea, are known to attack the eggs of Orthoptera, especially of Acrididæ and Locustidæ. Very likely this wasp, collected in Poona, is parasitic on the eggs of some Locustid which lays its eggs inside the midrib of sugarcane.

**Permeability in Monolayers.**—A modified form of evaporant has been employed by Sebba and Rideal (*Trans. Far. Soc.*, 36, 273) to measure the rate of diffusion of water through monolayers of simple and complex films. The permeability ratio for water with various films supports the hypothesis that the rate of diffusion of water through the film depends more on the proportion of water in the film itself than on the physical state of the film. The permeability ratio has also been determined using solutions of alcohol and ammonia in water. The evaporation of both alcohol and ammonia is retarded by the monolayers. It is interesting to note that the extent of evaporation depends upon the spreading liquid in which the film-producing substance is dissolved.

M. R. A.

**Relation between Nitrogen Deficiency in Soils and the Accumulation of Tannins in the Cotton Plant.**—In the course of the investigations into the cause of periodical failures of the American cotton crop in the Punjab by Dastur it may be recalled that the presence of tannins was noted as peculiar to the leaves of this cotton suffering from the yellowing and shedding of the leaves characteristic of the disease. In the course of further investigations it has been found that such accumulation of tannins is connected with a deficiency of nitrogen in the soil (R. H. Dastur, *Ind. Jour. Agr. Sc.*, Vol. XI, Part II). Nitrogenous manuring increased the nitrogen content of the leaves as against controls not so manured, and in the

leaves having a higher nitrogen content tannins were absent. The border line figure for the nitrogen content deciding the presence or absence of tannins was found to be about 2.5 per cent. of the dry matter of the leaves, the tannins developing if the figure goes below this level. The test for tannin is to be made when the plant is in the flowering stage and if a positive result is obtained at this stage then it may be taken as a biochemical index of the deficiency of nitrogen in the plant. The practical value of this observation lies in the fact that the nitrogen content of the leaves can be increased by nitrogenous manuring. Where a positive test for tannins is obtained when the plant is in the flowering stage an application of sulphate of ammonia is found to greatly increase the yield and to improve the opening of the bolls. If however the soils rest on a saline sub-soil then these results do not apply. In the Punjab soils the outward appearance of the plants on such soils is sufficiently distinctive of the character of the soil and this can be taken as a reliable test to decide about applying sulphate of ammonia, even though the leaves give a positive test for the presence of tannins. These results have been confirmed by experiments conducted on the cotton fields of private cultivators also. It may be noted that even apart from the relationship of tannins to nitrogen content, nitrogenous manuring brings about a certain degree of mitigation of this disease.

A. K. Y.

Mr. Zal R. Kothavalla who has been appointed Officiating Director, Dairy Research, in succession to the late Dr. W. L. Davies, in addition to his own duties as Principal and Animal Husbandry Officer, Bangalore, is a well-known scientist, who, as Imperial Dairy Expert, did considerable work for advancing Dairy Research in this country. A number of his papers on Dairying and Dairy Products have appeared in the *Indian Journal of Veterinary Science* and other journals. He was born in 1896; after passing (1918) the B.A., of the Bombay University with specialization in Animal Husbandry and Dairying, he took the B.Sc. (Agr.) degree of the Edinburgh University and N.D.D. of Scotland (1921). He held the posts of the Dairy Superintendent of the Bombay Municipality (1922-25); Assistant to the Imperial Dairy Expert, Bangalore (1925-32), and the Imperial Dairy Expert (1932-41). He attended the ninth International Dairy Congress, Copenhagen, in 1931 as the official delegate from India.

**India: 1,000 Years Ago.**—The Archæological Survey of India has salvaged from oblivion a work, pieced together from various sources, bearing on the physical, cultural and scientific progress of India and its contiguous countries about a thousand years ago by the world-

renowned oriental scholar, Al-Biruni, in the form of a Monograph in Arabic.

This reputed savant (whom Sir Aurel Stein considered the Leonardo da Vinci of the eleventh century) was one of the luminaries in the court of Sultan Mahmud of Ghazni and had extensive opportunities of obtaining first-hand knowledge of the geography of the different lands of Asia and, being a linguist of rare ability, he had an intimate knowledge of the languages, sciences, literature, philosophy, religion and beliefs of the races amongst whom he mixed freely.

The results of his observations are embodied in his monumental work entitled "al-Qanun al-Mas'udi". This monograph, which has just been published by the Archaeological Department, is an epitome of such portion of the work as deals mainly with the physical geography and mineralogy of India.

The monograph is arranged in four chapters. In the first chapter the author describes the condition of the earth in general and the geographical division of the countries in particular in relation to their latitude and longitude, illustrated by a tabular statement.

The second chapter is devoted to the genesis of the world, of primeval man and of the glacial theory, which was apparently conceived by this great scholar for the first time, as early as the eleventh century, on the evidence existing on the hilltops of Yemen (Arabia) and their neighbourhood, of fossils and fossilised bones, generally associated with aquatic animals. In the third chapter mention is made of precious and semi-precious stones and other minerals such as gold, silver, copper and iron together with their location and mode of acquisition.

The fourth and last chapter deals with (a) the vegetable world, *viz.*, herbs, plants, fruits, drugs, barks together with their properties, usefulness and location and (b) the animal kingdom, both aquatic and terrestrial, with their characteristic nature and mode of life.

The editor, Zeki Validi Togan, a Turkish oriental scholar, wandered at large in search of Al-Biruni's invaluable works and salvaged them from different quarters of Europe and Asia. He then set himself to work on them and, after labouring hard for several years, prepared this monograph. After trying in vain to find a publisher on the Continent, he approached the Director-General of Archaeology in India, who, in appreciation of the merit of the work, decided to publish the text in advance of the English translation.

**Swat Valley Expedition.**—The Archaeological Survey of India has issued a monograph compiled by Prof. Evert Barger and Mr. Philip Wright, who along with Mr. T. D. Weatherhead, explored the Swat Valley and the Oxus territories of Afghanistan in the summer of 1938. The expedition was led by Prof. Barger. The object of the expedition was to trace the spread of Buddhism and hellenistic art from India, across Pamirs and the Tarim Basin, to China. "Our object in organising this expedi-

tion was a modest one. We wanted to call attention to these problems, and, by adding something to the scattered raw material, to revive the study of a subject to which British enterprise has not contributed much since the Great War outside the administered frontier of India."

The lands between the Oxus and the Indus form one vast canvas which must be studied as a whole and which was the meeting ground of three great civilizations, *viz.*, those of India, China and the Græco-Roman civilization of Western Asia, during the centuries between Alexander's Eastern expedition and the Islamic invasion. The Barger expedition has broken new ground in exploring the country north of the Hindu Kush, where they have explored a large number of sites in Wakhan. The discovery of hellenistic stone columns of Corinthian style at Kunduz near the Oxus is of considerable interest, as such remains have never been found north of the Hindu Kush.

In the Swat region, the British expedition excavated several sites in the Barikot District, the more important being the stupa at Kanjar Kote and the Buddhist remains at Gumbat, Amluk and Abarchinar, all on the left bank of the Swat.

Professor Barger writes: "The first tidings of Amluk, a site which had not been made known to Sir Aurel Stein, were brought by shepherds who took their buffaloes to that remote mountain top for summer pasture. These men had never seen a white man before. Until rumour reached them of our camp at Barikot and our quest for *buts* (idols), their only contact with European civilization had been the occasional passage of an aeroplane over their eyrie.

"Our work at Barikot had two distinct, though closely related objects. The first was a survey, as comprehensive as possible, of all ancient remains both in the three side valleys and on the right bank of the Swat river. The map which was made attempts to show not only the existing remains of stupas, monasteries and fortresses, but also those of some of their dependent villages and terraced cultivations, dead for fifteen hundred years. It was our hope that in this way it might be possible to determine the area of settlement, and the relation between domestic remains and areas of cultivation to see, in fact, what this small area looked like in Buddhist times.

"Our second object was to excavate a number of sites, not so much with a view to collecting sculpture and museum pieces, as to estimate the relation of different pieces of sculpture to one another, to examine the archaeological context in which they are found, to establish the main types of sculpture in Swat and to determine, if possible, the relation between specific pieces of sculpture and domestic objects—coins, seals, ironwork or terracottas, which because of their appearance elsewhere in a dateable context, might help to provide the beginnings of an archaeological chronology of Gandharan Art.

"Two or three more general problems must always be at the back of the mind of the archaeologist who turns to these frontier regions; why it was that such a virile, hybrid,

local art sprang up in a comparatively small area in these rocky foothills, and spread, undergoing some modification on the way, to Afghanistan and Chinese Turkistan; how such a large population—Hiuen Tsiang speaks of 1,400 monasteries and 18,000 monks—was supported in these bare, now almost waterless valleys; how and when the monasteries came to be abandoned and destroyed.”

**Earthquakes in the Hindu Kush Region.**—A note published by the Indian Meteorological Department discusses the results of a special study of the seismological features of the strong earthquake which occurred on November 21, 1939 (at 16 hr. 31 m. 43 s. I.S.T.) in the Hindu Kush mountains.

The shock caused some structural damage at Gilgit and Srinagar and was felt with varying intensities over the whole of Kashmir State, North-West Frontier Province, Afghanistan and the north Punjab. Lahore appears to be the farthest place from the epicentre to experience the shock.

This study is based on instrumental data collected from 32 stations of the world and seismograms from the five Indian observatories and Colombo. The epicentre of the shock is located at latitude 36 degrees 11 minutes North and longitude 70 degrees, 53 minutes East in the Hindu Kush mountains, near the border of Chitral State in Afghanistan. The depth of focus is calculated about 130 miles below the earth's surface. These results are in agreement with those of the previous deep earthquakes from the same region.

Some characteristic features observed in the seismograms of this shock were found present with marked similarity in the case of the previous deep quakes from this region. Seismograms of deep earthquakes are in general more complicated and location of their epicentres more difficult than those of normal ones. But in the case of the Hindu Kush shocks it is possible to get reliable information as to their origin from the seismograms of any one Indian station.

Another remarkable aspect of the deep shocks from this region is that they are distributed in a small area round about the point 36.5 degrees North and 70.5 degrees East, from which position alone as many as 22 shocks are reported to have originated in the past 20 years. A statistical analysis shows that these shocks occur at the rate of two per year and that the strong ones exhibit a marked tendency to originate in winter. Of late, the seismic activity of the Hindu Kush appears to be on the increase.

**Titanium Ore** is finding increasing use in the American industry and, India by far the world's largest producer of this ore, is the United States' main source of supply.

Titanium ore, in the form of ilmenite in India, is found in association with monazite from which thorium nitrate, used in the manufacture of incandescent gas mantles, is derived and titanium ore was formerly considered a by-product of the monazite industry. In recent

years, however, it has become more important than monazite because of the demand for its contents of titanium oxide in the manufacture of titanium paints.

Titanium ores which are useful primarily because of their whitening and obliterating powers are used in the United States not only in the paint industry—their main use—but also in the rubber, linoleum, leather, plastic, soap, printing ink, textile, ceramic and ferro-alloy industries.

**Studies of Clouds.**—During the last two years systematic researches have been carried on at Poona by taking photographs of some types of natural clouds at short intervals of time. The various changes thus observed confirm a number of points brought out by experiments on artificial clouds. This forms the subject of a paper just published by the India Meteorological Department (*Scientific Notes*, Vol. VIII, No. 94) in which some of the selected series of photographs are reproduced.

The movement and appearance of clouds give us valuable information about the physical conditions of the atmospheric layers in which they are embedded. Apart from the routine observations, such as the measurement of height, velocity and direction, total amount, kind, etc., of clouds at the time of observation at a meteorological station, special studies are in progress at different places. In recent years, for example, artificial clouds have been produced in the laboratory and their movements under conditions resembling those in the atmosphere are watched and recorded carefully. The clouds thus produced greatly resemble in form and pattern, the natural clouds.

**Census of Essential Drugs.**—With a view to maintaining a check on the import, manufacture and sale of essential drugs, a new Order has been promulgated by the Central Government under the Defence of India Rules. The Order is called the Essential Drugs (Census) Order, 1941, and is to come into force at once.

In accordance with this Order, any person engaged in the business of manufacturing, importing or selling such drugs, whether wholesale or retail, is required to submit to the authority specified for his area, so as to reach that authority not later than the 27th day of each month, a return showing the quantity of any essential drug in his possession or under his control within British India on the 20th day of such month. No return, however, is required to be submitted if the total quantity of any essential drug in the possession or under the control of any person is less than that specified in the Order.

Every manufacturer, importer or dealer in drugs, whether wholesale or retail, is required to keep a record of the purchase or sale of any quantity of an essential drug made by him, whether such quantity is less than that specified or not. No record of such transactions, however, need be kept by a retailer if the total quantity of an essential drug in his possession or under his control is less than that specified.

The correctness of any return submitted or record kept in pursuance of this Order is subject to verification by any person authorised by the Central or the Provincial Government for this purpose. The person so authorised will have the right to enter and inspect the premises of any manufacturer, importer or dealer and to inspect and take copies of any records, books or accounts kept in connection with such business.

The following are the authorities specified for receiving the returns in the various areas:—

Madras, the Central Provinces and Berar, and Coorg—The Deputy Assistant Director General (Medical Stores), Madras.

Bombay Presidency, Sind and Ajmer-Merwara—The Deputy Assistant Director General (Medical Stores), Bombay.

Bengal Presidency, Bihar, Orissa and Assam—The Deputy Assistant Director General (Medical Stores), Calcutta.

United Provinces, the Punjab, North-West Frontier Province and Baluchistan—The Deputy Assistant Director General (Medical Stores), Lahore.

According to a Press Note from the Supply Department the first stage in making India self-sufficient in the manufacture of high explosives has been reached by the production of pure toluene for nitration at a newly erected toluene plant.

Another notable development is that basic steel manufactured by acid process from 100 per cent. scrap is now being made by an engineering works. It is anticipated that this will relieve the shortage of spring steel required by the Railways which had hitherto been imported.

**Electric Grid Scheme for Orissa.**—An electric "grid scheme" for the Province of Orissa is under investigation. The sources of power are hydro and thermal energy as hydro-electric power is available for South Orissa while for North Orissa cheap coal may be obtained.

Two possible hydro-electric sites are the Bogra Falls of the Kolab river, about 11 miles from Jeypore, and the Duduma Falls of the Machkand river, about 40 miles from Jeypore—both in the Koraput District. The Kolab River Scheme consists of a dam storing about 2,200 million cubic feet of water for a peak load of 72,000 K.W. and continuous load of 36,000 K.W. under a gross head of 611 feet.

The whole scheme would cost about Rs. 3,75,00,000 excluding transmission lines and substations. As, however, such an immense load will not be available within economic distance of the falls in the near future, a modified scheme, which will have a maximum installed capacity of 18,000 K.W., is under consideration.

From the Duduma Falls it is possible to obtain a drop of about 830 feet at a minimum continuous flow of nearly 150 cusecs and it appears from preliminary investigation that the civil engineering portion of this scheme may be slightly less than that of the Kolab Scheme.

The preliminary survey so far carried out shows that ample load will be available within

economic distance of transmission from the proposed sites and it appears that one more paper mill may be run economically in the district.

**World Consumption of Jute.**—The Indian Central Jute Committee has just issued an important brochure entitled "World Consumption of Jute, 1938-39 and 1939-40" (*Economic Research Bulletin No. 1*). This publication has brought together much valuable statistical material on jute trade and industry and gives various estimates that are not available elsewhere.

"Reliable estimates of the total consumption of jute in the world are given in this *Bulletin* for the period from 1933-34 to 1939-40. They show how this figure reached its peak in the year 1936-37, when an aggregate consumption of about 123 lakhs of bales was reached, and how in spite of the hectic buying at the beginning of the war, the total world consumption of jute in 1939-40 fell considerably short of this peak figure. Independent estimates of the yield of the jute crop are also given for the 1938-39 and 1939-40 seasons. The *Bulletin* also embodies the results of important investigations carried out by the Economic Research Sub-Section of the Committee in connection with the estimation of the world consumption of jute. These cover a number of important subjects, such as the trend of Indian jute mill production as compared with that of world industrial production, changes in the jute export trade, effect of war on the consumption of jute, etc.

"An interesting feature of the *Bulletin* is an attempt to give a general idea of the extent of jute consumption in the 1940-41 season on the basis of the demand for jute in the first few months of the season. The brochure concludes with a forecast that the consumption of jute in 1940-41 will be abnormally low."

**Indian Central Cotton Committee.**—The monsoon meeting of the Committee was held on the 18th and 19th July 1941, Mr. P. M. Kharegat, C.I.E., I.C.S., Vice-Chairman of the Imperial Council of Agricultural Research, presiding.

The progress reports of the several agricultural schemes financed by the Committee during the past year were reviewed and recommendations made regarding future lines of work. The extension of the Broach and Jalgaon Cotton Breeding Schemes, the Wilt Cotton Breeding Scheme, Poona, the Scheme for the improvement of Wagad cotton at Viramgam and Jagudan, the Cotton Genetics Research Scheme, Indore, and the Mysore (*Doddahathi*) Cotton Scheme were sanctioned.

Among the new schemes considered and approved were the scheme for the Improvement of Dharwar-American Cotton, two marketing survey schemes—one for the Madras Province and the other for Gujarat and the adjoining Agencies and States of Kathiawar and South Rajputana—and a Model Projects Scheme for the extension of improved methods of cultivation in the Rohilkhand and Kumaon Circle of the

United Provinces. The Committee also recommended the appointment of a co-ordinating Cotton Botanist for the Province of Bombay.

Among other questions that engaged the attention of the Committee, mention may be made of the following:—The establishment of an export organisation for extending the use of Indian cotton goods in other countries; alternative uses for short-staple cotton; and improvement of cotton forecasts. The annual report of the Technological Laboratory for the year ending May 31, 1941, was approved.

**Medicinal Drugs and Chemicals.**—The Bombay Government have arranged for the production of the following medicinal drugs and chemicals, under the guidance of their Industrial Research Chemist, to meet the large demands of the Supply Department: Phosphorus, tartaric acid, potassium perchlorate, iodine, strontium carbonate and carbon bisulphide.

**Display of Indigenous Products.**—According to a press note, issued from the Supply Department of the Government of India it has been decided to establish sample rooms at six Provincial centres with the Controllers of Supplies, Calcutta, Madras, Bombay, Karachi, Lahore and Cawnpore. It is proposed to establish a sample room at New Delhi as well.

In all these sample rooms it is proposed to display (1) such articles as are at present not produced in India but demand for which exists; (2) articles not being produced in sufficient quantities in India to meet the demands in full; (3) articles previously exclusively produced by ordnance factories at the various centres but which are now proposed to be transferred to trade production.

An Officer on Special Duty has been appointed to organise the establishment of the sample rooms and arrangements are being made for specified samples of articles required by the Defence Services to be provided.

**Granite Rollers in Soap Making.**—It is well known that toilet soap manufacturers use either granite rollers or steel rollers in the milling processes. On account of war and the consequent difficulties some of the users of the granite rollers have found it difficult to import the same from abroad.

Recently a big paint manufacturing firm in Calcutta who use granite rollers in their paint industry were faced with the same difficulty and they experimented with granite found in the State of Mysore. These have given complete satisfaction.

Information regarding these rollers may be had from Messrs. Narayanaswamy & Son, Lakshmipuram, Mysore.

#### ASTRONOMICAL NOTES

The Sun will be at the autumnal equinox on September 23, 1941, at 16<sup>h</sup> 30<sup>m</sup> I.S.T.

**Eclipses.**—Two eclipses will occur during the month;

(1) a partial eclipse of the Moon on September 5, 1941, the circumstances of which are as follows:—

Moon enters umbra	10 <sup>h</sup> 49 <sup>m</sup> p.m. I.S.T.
Middle of Eclipse	11 <sup>h</sup> 17 <sup>m</sup> „ „
Moon leaves Umbra	11 <sup>h</sup> 45 <sup>m</sup> „ „

The magnitude of the eclipse will be 0.06 (taking the Moon's diameter to be unity).

(2) a total eclipse of the Sun, which will be visible generally as a partial eclipse throughout India except in the extreme south. The path of totality commences near the Caspian Sea in Russia and passing through Turkestan, Central Asia and China ends in the middle of the Pacific Ocean.

	Madras	Bombay
Eclipse begins	8 <sup>h</sup> 16 <sup>m</sup>	7 <sup>h</sup> 50 <sup>m</sup>
Greatest phase	8 <sup>h</sup> 50 <sup>m</sup>	8 <sup>h</sup> 35 <sup>m</sup>
Eclipse ends	9 <sup>h</sup> 26 <sup>m</sup>	9 <sup>h</sup> 24 <sup>m</sup>
Magnitude of partial phase	0.08	0.23

**Planets during September 1941.**—Mercury is in the evening sky but will be too close to the Sun and cannot be seen well, except during the last few days of the month. Venus continues to be an evening star; it is increasing in brightness and will set about a couple of hours after the Sun. Mars will rise an hour after sunset and is steadily becoming brighter, its stellar magnitude being  $-2.3$  at the end of the month; the planet is stationary on September 6 when it commences to move in a retrograde direction among the stars along the southern border of Pisces. Mars will be the most prominent object in the night sky during the month.

Jupiter will be in quadrature with the Sun on September 13; it rises about midnight and will be a conspicuous object (magnitude  $-2.0$ ) in the eastern sky during the second half of the night. Saturn is stationary on September 11 when it begins to move westward among the stars in the constellation Taurus. The ring system continues to widen, the angular dimensions of the axes of the ring ellipse being  $43'' \cdot 2$  and  $17'' \cdot 5$ . About three or four degrees to the north-east of Saturn is Uranus which reaches a stationary point on September 5, and starts moving in a retrograde direction a little to the south-east of the well-known star cluster Pleiades. Among occultations of some interest that can be observed in this country may be mentioned that of the star  $\rho$  Sagittari (mag. 4.0) on September 1, and that of the first magnitude star Aldebaran ( $\alpha$  Tauri) at about midnight on September 12. T. P. B.

#### SEISMOLOGICAL NOTES

During the month of July 1941 seven slight earthquake shocks were recorded by the Colaba seismographs as against one slight and three moderate ones recorded during the same month in 1940. Details for July 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
July 1941—		H.	M.	(Miles)		(Miles)	
2	Slight	08	12	1450			
9	Slight	06	09	1550			
14	Slight	07	32	1450	11°·7 N., 93°·0 E., near the Andaman Islands		Apparently the after shocks of the very large earth- quake of June 26, 1941
18	Slight	05	01	1500			
22	Slight	01	49	1450			
24	Slight	19	23	3550			
27	Slight	01	42	4700			

### ANNOUNCEMENTS

**Register of Chemists.**—An All-India Register of Chemists is being prepared by the Indian Chemical Society. All chemists employed or unemployed are requested to have their names enrolled in the Register of Chemists in the prescribed form. Such a register will be of immense service and value to all interested in the chemical profession and trade, and also in the employment of chemists as a source of ready reference. The unemployed chemists will find it useful to register their names as the Society intends to put them in touch with employers whenever occasion arises. No fees are demanded for registration. Necessary forms will be sent on application to P. K. Bose, Hon. Secretary, Indian Chemical Society, P.O. Box No. 10857, Calcutta.

The next meeting of the Inter-University Board, India, will be held at Chidambaram on January 6-7, 1942.

We acknowledge with thanks the receipt of the following:—

"Journal of the Royal Society of Arts," Vol. 89, Nos. 4586-87.

"Agricultural Gazette of New South Wales," Vol. 52, Pts. 5-6.

"Indian Journal of Agricultural Science," Vol. 11, Part 3.

"Indian Forester," Vol. 67, Nos. 7-8.

"Indian Farming," Vol. 2, No. 7.

"Indian Medical Gazette," Vol. 76, No. 7.

"Journal of the Indian Botanical Society," Vol. 20, No. 4.

"Journal of the Indian Chemical Society," Vol. 18, No. 4.

"Nature," Vol. 147, Nos. 3731-33.

"The Philippine Journal of Science," Vol. 74, Nos. 1-3.

"The Indian Journal of Physics," Vol. 24, Part 1.

"Proceedings of the Royal Society of Edinburgh," Vol. 60, Part 4.

"Canadian Journal of Research," Vol. 19, No. 4.

"Sky," Vol. 5, No. 8.

"Science and Culture," Vol. 7, No. 2.

"Ceylon Journal of Science," Vol. 3, Part 2.

"The Indian Trade Journal," Vol. 142, Nos. 1829-33.

### BOOKS

"Sons of the Soil," edited by W. Burns. (Manager of Publications, Delhi), 1941. Pp. 128 + 44 plates. Price Rs. 2-6 or 4sh.

"Anthropological Papers." (Calcutta University), 1941. Pp. 187.

"The Scientific Photographer," by A. S. C. Lawrence. (Cambridge University Press), 1941. Pp. x + 180. Price 18sh.

"Reports on Progress in Physics," Vol. VII, edited by J. H. Awbery. (The Physical Society, London), 1941. Pp. 1 + 362. Price 22sh. 6d.