

## Research Items.

**A Communal House on Little Andaman.**—The supplement to *The Indian Antiquary* for January is an instalment of Sir Richard Temple's "Remarks on the Andaman Islanders and their Country", which consists of extracts from a report by Mr. P. Vaux on a reconnaissance in Little Andaman on Jan. 25–Feb. 4, 1902. Mr. Vaux had been detailed to operate against the Jarawa. This tribe lived in the then untouched forests of Little Andaman, and had not been brought under the control of the administration. They indulged in periodical raids, in which murder regularly played a part. Their exact location was not known, and they had proved both elusive and unapproachable. Shortly after the date of this report, another punitive expedition was successful in dealing with them, but Mr. Vaux was killed in the attack. In this extract he describes several camps of the Jarawa, empty when he reached them, and a large communal house or camp, situated at the top of a steep hill, and approached by seven paths. It was in a clearing which had been carefully prepared. Several large trees had been felled, not only for space, but also to give outlook. Two of the entrances had sloping log platforms to serve as look-outs, and probably when the tribe was in residence (it left the camp for small hunting huts in the dry season) each entrance was guarded by similar platforms. The hut was roughly oval, being sixty feet by forty feet in dimension, with a circumference of fifty-four yards. Seven stout posts in the centre supported the roof, and from the top of the roof between these posts were 250 pigs' skulls neatly fastened up in a basket. Below the skulls was a big fireplace, while round the walls were the smaller family fireplaces, probably a dozen in number when the hut was full. Each fireplace consisted of four stakes driven in the ground. About three feet from the ground a piece of matting fastened to the stakes formed a shelf for the meat. The thatching was decorated with hundreds of fan-like bunches of leaves, and honey pots, baskets, unstrung bows, leaf water-vessels, etc., hung from the roof.

**A Statistical Measure of Civilisation.**—Dr. R. M. Harper, in an article on some demographic characteristics of American educational centres in the February *Scientific Monthly*, describes an attempt to measure the degree of civilisation in twenty-five towns in the United States in which a university dominates the life of the community. Towns with large factories are excluded, and none is chosen with less than 80 per cent of white population. In the average of the twenty-three towns, adult illiteracy is 2.18 per cent, compared with 5.50 for the urban population of the whole country. Persons per family average 3.86, compared with 4.24; children average 1.38, compared with 1.58; and males represent 47.2 per cent of the population, compared with 50.1 in the urban population as a whole. This last figure is the most striking. In all the towns the percentage of females is higher than that of males, while the proportions are reversed in nearly all the States in which the towns lie. It should be noted that few of the actual students in the colleges come into the figures since the census enumerates them in their homes. Dr. Harper discusses the value of the different orders of statistics which he uses, and lays stress particularly on the sex ratio and the illiteracy count.

**Food of Grasshopper Mice.**—Examination of the stomach content of birds has become a standard method of assessing their food, but the method has seldom been applied to mammals, perhaps because

the same doubt has never arisen as to the usefulness or harmfulness of any particular species. We would direct attention, therefore, to a good example of mammalian stomach-content assessment, which, most unusually, sets the stamp of good-conduct upon one of the rodents. Vernon Bailey and Chas. C. Sperry, in a thoroughgoing account of the life-history and habits of the genus *Onychomys*, record analyses of 96 stomachs (U.S. Dept. Agr., *Tech. Bull.* No. 145, November 1929). The materials found are specified in detail and the numbers of individuals of, say, grasses or insects, are given. This method is much more satisfactory than the volume-percentage method which has been adopted in the United States and elsewhere for the recording of the food of birds. The results were that eight-ninths of the food of *Onychomys* were found to consist of animals, mostly crickets, grasshoppers, caterpillars and moths (55.8 per cent), and beetles (20.73 per cent). Cultivated grain comprised less than 5 per cent of the food, and as it consisted mostly of wheat eaten in July, it was probably waste. It is seldom that a rodent does anything but harm to agricultural interests, but here is a little group of species and varieties which are economically beneficial.

**A Rare Cephalopod.**—Mr. G. C. Robson has described and discussed a new species of *Melanoteuthis* collected by Beebe during one of the *Arcturus* voyages (1926), from the deep waters near Cocos Island (E. Pacific) ("On the Rare Abyssal Octopod *Melanoteuthis beebei* (sp. n.): A Contribution to the Phylogeny of the Octopoda" by G. C. Robson, *Proc. Zool. Soc. London*, Oct. 1929). Two specimens were obtained, and these proved so interesting that a special account is given of them apart from Dr. Beebe's other cephalopods. The examination of the present species throws new light on the systematic position of the genus and probably of the family Vampyroteuthidæ to which it belongs. *Melanoteuthis*, although specialised in some respects, has several features which suggest that in it we see the most primitive octopod and that it retains characteristics of the common stock from which the Decapoda and the Octopoda arose. Chief among these is the presence of filaments contained in the velar pouches which Joubin (1928) regards as a vestigial pair of arms—a view fully confirmed by Mr. Robson. There are several distinctive features. The nervous system is diffuse, the suckers pedunculate, there is a valve in the funnel and a median plate-like shell rudiment, whilst there is no white body: characters not found in the Octopoda but resembling the Decapoda. The radula is simple and undifferentiated as in most primitive Decapoda and in *Argonauta*. There are certain features which are found in the Cirroteuthidæ and some not found in the Cirroteuthidæ but found in other octopods. The author suggests dividing the Octopoda into three sub-orders—Vampyromorpha, Cirromorpha, and Incirrata; *Melanoteuthis* belonging to the first.

**Opium in the Poppy.**—It was at one time thought that the elaboration of active principles in medicinal plants underwent either qualitative or quantitative attenuation when the plants were cultivated away from their natural habitat. Thus, in his "Farmacopea riformata" (Venice, 1655), Quercetano states that, when transplanted into improved soil and carefully cultivated, the opium poppy becomes less poisonous. This statement, often repeated, has been shown, by long series of experiments in Asia and in Europe, to be without foundation. A similar conclusion is arrived at from the results obtained in the Royal Botanic

Gardens at Naples. According to Cavara and Chistoni, in a paper published in the *Rendiconti dell'Accademia delle Scienze Fisiche e Matematiche di Napoli* for 1929, the morphine content of the poppy was raised, by improved cultivation and selection, from 5.46 per cent in 1923 to 10.11 per cent for the white, and to 12.14 per cent for the black poppy in 1924. Experiments on the hybridisation of the two varieties show that the opium obtained from hybrids of the fourth generation gives a high percentage of morphine. The diminishing morphine content in the opium content of successive incisions is also confirmed. Moreover, the occurrence of rain either during or after the incision exerts a peculiarly harmful effect, since not only does the opium lose its viscosity and consistency, but its morphine content is also greatly reduced.

**Indian Liverworts.**—The only comprehensive work upon Indian Liverworts so far has been the paper by Mitten in the *Jour. Linn. Soc.*, 5; 1860. Many more species have since been described, especially by Stephani, but there is much room for an illustrated account of Indian liverworts. The first step towards such a publication has been taken in the issue by the University of the Punjab, Lahore, of Part I. of the "Liverworts of the Western Himalayas and the Punjab Plain", by Shiv Ram Kashyap. This volume deals with the Anthocerotales, Marchantiales, Sphaerocarpaceales and the Anacrogynous Jungermanniales. The Acrogynæ will be dealt with in a second volume. The author hopes that later it may be possible to issue an account of the group for the whole of India, but large collections must first be made in the eastern Himalayas and South India. In this work indigenous species receive fuller treatment and more figures. A brief discussion of the area studied and the habitat of the liverworts is given in the introduction, whilst a full glossary and a key to the genera precedes the systematic description of species.

**Sylvicultural Research in India.**—The paper on "Sylvicultural Research in India; its Organisation, Problems, and Methods", by H. G. Champion, in the second issue of vol. 3 of *Forestry*, should make a wide appeal to all professional foresters of the gazetted ranks and to all interested in technical forest research throughout the British Empire. It may be contended without fear of contradiction that it would have proved impossible to write this paper a decade ago, and at the present day it could have only been written, for the Empire, by a research officer of the Forest Research Institute at Dehra Dun with all the data of the past history of sylvicultural research in India at his disposal, and the wide knowledge possessed by the author himself. It is impossible here to do more than direct attention to this valuable paper. Mr. Champion discusses the present division of the work of research between the central sylviculturist at Dehra Dun and the provincial research sylviculturists who have been appointed in all the provinces of India (and Burma) with the exception of Bombay and the Punjab. He also points out the necessity of selecting for such posts the best available officer and not the man who has shown himself a failure in executive or administrative work. He then discusses in detail the lines upon which research work is now carried out and the enormous number of problems which such work has disclosed as awaiting solution. That astonishing progress has been made during the past quarter of a century in a subject which was almost a sealed book thirty years ago the paper provides ample proof. It is with no idea of minimising the value of *Forestry* to express the hope that Mr. Champion's paper may be republished in such a form

that it may become available to a wider circle of readers.

**Jan Mayen.**—Norwegian interest in Norway's new arctic territories in Spitsbergen, Bear Island, and Jan Mayen, is shown in the many valuable publications of the Svalbard og Ishavs-Undersökelse, which appear at frequent intervals under the collective title of *Skrifter om Svalbard og Ishavet*. A more popular series appear as *Meddelelser*, some of them extracted from other publications. One of the latest is a small pamphlet on Jan Mayen (*Norsk Geografisk Tidsskrift*, 2, 7), which gives a summary of the structure and climate of that island, beside a full account of its history and the seal fishing in the vicinity. The paper is chiefly valuable for its full bibliography of Jan Mayen.

**New Cretaceous Ostreidæ from Texas.**—Two new species of Ostreidæ from the Austin Chalk of central Texas described by L. W. Stephenson (*Proc. U.S. Nat. Mus.*, vol. 76, art. 18) are of particular interest; one, *Ostrea centerensis*, n. sp., because it has been found abundant in a zone only a foot or two in thickness without trace of further occurrence in the beds above or below. The author suggests it was a temporary immigrant from the tropical seas of the Caribbean region. The other, *Exogyra tigrina*, n. sp., is remarkable in that it offers one of those rare cases of the preservation of colour markings in a fossil. These take the form here of brownish, radiating colour bands alternating with grey bands. It recalls the similar markings on the European cretaceous *Gryphæa columba*, Lamk., cited by the late R. B. Newton (*Proc. Malac. Soc.*, vol. 7, p. 283) when treating on the subject generally, a paper Mr. Stephenson has not apparently seen.

**Continental Connexions in the Cretaceous.**—In the *Amer. Jour. Sci.* for January 1930, Prof. C. Schuchert discusses the important memoir on the dinosaurs and other reptiles of the Cretaceous of the Argentine recently published by F. von Huene (*Anales del Museo de la Plata*, vol. 3, series 2a, p. 196; 1929). Von Huene's hypothesis of an Asiatic-Polynesian-South American land-bridge across the southern Pacific raises again the very difficult problem of how to explain the disappearance of such extensive land-bridges. Schuchert suggests an alternative and more probable route for Asiatic migrations through Australasia to Antarctica and thence to South America or Africa. Von Huene states that South America is the home of the specialised marsupials, and that from there representatives of both diprotodonts and polyprotodonts spread to Australia but not to New Zealand. Previously the monotremes and allotheres had spread from south-eastern Asia to the Australian region, and from there the allotheres reached South America, which became a new development centre for them. These and many other affinities, some of which are summarised in the paper, between the organic worlds of South America and the lands to the west, cannot be understood without the assumption of former land connexions, particularly in the Cretaceous. At that time the larger faunal elements might have advanced by stages from Asia to South America, but, at the latest in middle Tertiary times, the continuity of the lands most have been broken through. In view of Schuchert's iconoclastic attitude towards continental drift hypotheses, it is interesting to notice that he fully recognises the geophysical difficulties in the way of assuming the foundering of land bridges, and that in seeking for a connexion between South Africa and Antarctica he is not averse to admitting a certain amount of drift to the north on the part of Africa.

**Raman Effects in Liquids.**—The issue of the *Physikalische Zeitschrift* for Dec. 1, 1929, contains a description of a new method of observing the Raman effect in liquids by Dr. R. Bär, of the University of Zurich, which gives more intense lines than previous methods and has cleared up some of the uncertainties with regard to the effect in benzol. The liquid is contained in a glass tube about a metre long, one end of which is widened into a cone closed by a glass plate, and the other drawn off sideways to a point to prevent reflection at the end. The light from a mercury lamp falls on the base of the cone and is focused by lenses at a point in the liquid near the apex of the cone, and the effect is observed from the side by means of a small mirror attached to the base of the cone at an angle of  $45^\circ$  to the axis of the tube. Evidence of the existence of increases of wave numbers by 605 and 990, that is, in the anti-Stokes law direction, and of decreases 2947 and 3179, was found in benzol, but none for the existence of the decreases 266, 1360, 1479, and 2630.

**Mass-Spectra of Mercury, Krypton, and Xenon.**—An investigation of the positive rays of mercury, krypton, and xenon, in which the relative abundance of the isotopes of these elements has been found by photometry of their lines in mass-spectra, is described by Dr. F. W. Aston in the February number of the *Proceedings of the Royal Society*. Whilst mercury has been found to have an atomic weight in close agreement with the accepted value of 200.61, the number calculated from the percentage abundance of the seven isotopes being  $200.62(6) \pm 0.05$ , the results for krypton and xenon are not in accord with older determinations. Their atomic weights as deduced from their densities are 82.92 (Kr) and 130.22 (Xe), whilst those calculated from the mass-spectra are  $83.77 \pm 0.02$  and  $131.27 \pm 0.04$ . The xenon used for the density determinations had been examined by Dr. Aston with a mass-spectrograph in 1922, and was then shown to be free from krypton, the only likely impurity, so that it seems possible that the reduction of the density data may have been incorrectly made. Dr. Aston mentions that the auxiliary information that is required for the accurate deduction of an atomic weight from a density is less well known than could be desired for these two inert gases, and suggests that the density determinations should be repeated, preferably with a microbalance at low pressures.

**Transparent Window Glasses.**—Since the discovery that ultra-violet light of wave-lengths close to  $302 \times 10^{-7}$  cm. would cure rickets in children, special window glasses transparent to these rays have been introduced, and as there were indications that they lost some of their transparency with use, the U.S. Bureau of Standards has investigated the properties of a number of these glasses. *Research Paper* 113, by Messrs. Coblenz and Stair, collects the results obtained. Sunlight at Washington at midday in summer contains 0.3 per cent of the curative rays, and of this the glasses in the market at the beginning of 1929 would transmit when 0.23 cm. thick and quite new from 63 to 48 per cent. After exposure to sunlight for a summer or to the light from a quartz mercury arc for 10 hours, their transmission had fallen to 49 and 23 per cent respectively, and remained approximately at those values on further exposure. A much more serious reduction is produced if the surfaces of the glass are not kept clean and free from dust.

**Formation of Nitric Oxide.**—Following on a recent statement that the yield of nitric oxide formed in the

arc is increased if carbon dioxide is present, Tartar and Hoard, in the January number of the *Journal of the American Chemical Society*, describe some careful experiments on this reaction. They find that, with currents of 65 milliamp., only one-sixth the concentration of nitric oxide is produced from a mixture of nitrogen and carbon dioxide as is produced from air, and the effect of reduced pressure is very slight. An increase in the yield was obtained by increasing the current by 50 per cent. The authors conclude that the reaction offers little promise as a method of nitrogen fixation in the arc.

**Measurement of Coal Dust Inflammability.**—One of the gravest hazards of coal mining—the coal dust explosion—is now recognised and countered by the process of stone-dusting the underground passages. Coals differ in inflammability, and in order to apply the remedy rationally a method has been devised which is described in the *Safety in Mines Research Board Paper*, No. 56, by A. L. Godbert and R. V. Wheeler (London: H.M. Stationery Office), whereby this property can be gauged in the laboratory. It consists in determining the proportion of inert dust necessary to suppress inflammation when small quantities are blown by oxygen through a heated tube. The results are comparable with those given by trials in an explosion gallery. By means of the test it was shown that the inflammability roughly increased with the content of volatile matter of the coal and more precisely was associated with the reactivity of the ulmin contents.

**Ignition of Gases by Electric Spark.**—The problem of discovering the exact process which takes place when a combustible gas is ignited by an electric spark is one of great importance in motor-car engineering. There are, however, so many variables to be considered when a magneto is employed for producing the spark that little progress has been made towards getting a solution. A paper by Messrs. Terada, Tumoto, and Yamamoto on the difference in the behaviour of different parts of a 'three-part spark' in igniting combustible gas mixtures, which is published in the *Scientific Papers of the Institute of Physical and Chemical Research, Tokyo*, p. 132, 1929, is of value in this connexion. They experiment on the spark obtained between equal spheres when the lead of the positive electrode is earthed or provided with a corona leakage from a needle point. The electricity was continually applied by a static machine. In this case, when the spark gap is about three times the diameter of either sphere, it is divided into three distinct parts which are quite different from one another and are called the positive, middle, and negative parts. The middle part is the most luminous, and its spectrum shows the head of the second positive band of nitrogen superposed on a continuous spectrum. The other parts give the ordinary spark spectrum of air together with some metallic lines. Tests were made to find out the igniting power of different parts of the spectrum. A fine jet of the combustible gas being experimented on was directed towards different parts of the jet and the number of ignitions that followed was noted. The frequency of the ignitions was much the greatest in the middle of the arc and was least at the junctions of the middle part with the positive and negative parts. Since the duration of the discharge in the middle part of the arc was only about a tenth of the duration of the positive and negative parts, it was not a cumulative time effect. There is a decided difference in the mode of excitation of the molecules in the different parts of the arc, and this has a great effect on its igniting properties.