Research Items

Eastern Himalayan Blood-Groups

IN view of the high percentage of Group *AB* found among Tibetans at Gyantse, Miss Eileen W. E. Macfarlane has obtained samples from Tibetans, Nepalis and Lepchas (*Man*, No. 159, August). The Tibetans were hospital patients and others at Kalimpong, North Bengal. The subjects either called themselves Bhutias or were Bhutanese. There are Bhutias in Sikkim State, who resemble the Tibetans physically and wear similar dress and ornaments. The Bhutanese were nearly all from Ha, Bhutan, and also belong to the Tibetan race. The sample in all numbered fifty-six. The proportion of the blood-groups differs considerably from the blood-groups observed by Tennant at Gyantse. The percentage of *B* is of the same order, and considerably lower than in the neighbourhood of Nepal. The percentage of *O* is much higher and of *A* lower than at Gyantse, the latter possibly being due to inbreeding, while the high proportion of *AB* may be a result of the Chinese garrison stationed there from the beginning of the century until 1912. The proportions found at Kalimpong suggest either that blood-group relationships differ markedly in different parts of Tibet, or that conditions in Gyantse are exceptional. One eighth of the Bhutias belong to Group *B*, more than a third to Group *A*, and almost one half to Group *O*, *AB* being rare. The preponderance of *O*, the characteristic group among American Indians, recalls the fact that the physical resemblances and similarities of artistic design between Tibetans and American Indians, especially the Navajos, has been noted as striking. The nearest Mongoloid neighbours of Tibet in China and Nepal are fairly high in *B* and it is remarkable that the Tibetans have absorbed relatively little of this group. They have evidently been isolated from the main stream of Mongolian migration since very early times.

Early Chinese Bronzes

AMONG a number of early Chinese bronzes from the Eumorfopoulos Collection, now in the British Museum (Bloomsbury), which are figured and described in the *Brit. Mus. Quarterly*, **11**, 3, by Mr. R. S. Jenyns, is the famous ram-handled *tsun* which belongs either to the Shang-Yin, or early Chou Dynasty. This piece should convince sceptics that the Chinese bronzes of the classic period are equal, if not superior, to those of any other civilization. It is modelled in the form of two rams standing back to back, and is supported on four legs represented by their forefeet. From between their heads rises the funnel, which forms the mouth. The body is covered with scales, which may, or may not, have been engraved after casting. The conquest of Shang-Yin by the Chou princes about 1100 B.C. does not seem to have altered the Shang-Yin style. This *tsun* shows only one of the four innovations regarded by Karlgren as making their appearance at that period. It must, therefore, be very closely related to the Shang-Yin bronzes. It is difficult to account for the sudden appearance of the Shang-Yin culture, which produced highly complicated and distinctive bronzes without apparent effort. The mastery of technique and the conventionalized motives argue a long process of evolution, and their inscriptions are far from primitive. Yet there is an enormous hiatus of time to be accounted for between the neolithic pottery from Western Kansu and Honan and these highly sophisticated vessels. The immediate ancestors of these are lacking. The Hsia culture, in which bronze casting and early forms of bronze must have made their appearance, remains a mystery. Even if it be admitted that bronze casting was introduced from the West in its finished form immediately before the Shang-Yin, the existence in Shang-Yin of forms evidently of great antiquity, which betray no affinity to known Western forms, is difficult to explain, without admitting a long process of internal evolution. We are compelled to believe that Shang-Yin culture had its roots in a distant past, but why almost no traces of that past have survived is a puzzle for which archæology has yet to supply a happy solution.

Passerine Birds of Ethiopia and Kenya

DURING the months of its sojourn in Africa in 1911 and 1912, the Frick Expedition collected about 5,200 birds, besides a number of eggs and nests, and copious field observations, all due to the energy and collecting ability of the late Dr. Edgar Alexander Mearns. The description of the passerine birds by Herbert Friedmann adds to the faunal knowledge of an area remarkable for the wide range of its conditions, from desert to tropical rain-forest, from a rainfall of 0–11 inches to 70–80 inches, and from sea-level to 15,000 feet (*U.S. Nat. Mus., Bull.* **153**, 479; 1937). Among the general features described is the marked tendency of far more lowland birds to range high up the mountain slopes in Ethiopia (to an altitude of 7,000–8,000 feet) than reach to about half that altitude (4,500 feet) in more equatorial portions of the continent. The authors regard the birds of these regions as having been derived from the steppes of south-eastern Asia by way of Asia Minor and Arabia during Pliocene times. In the course of this extensive movement many birds moved southwards through the area, such as the ancestors of *Francolinus sephaena*, *F. africanus*, *Streptopelia capicola*, *Lophoceros melanoleucos*; others remained and formed a centre in which new species developed, and from which westward migration probably contributed to the fauna of the western savannahs the ancestors of such forms as the gound hornbill (*Buceros abyssinicus*), the parakeet (*Psittacula krameri*), the roller (*Coracias abyssinicus*) and the chat (*Oenanthe bottae*).

Self-fertilization in Japanese Slugs

THAT a pulmonate mollusc may possess the power of laying fertile eggs when kept in strict isolation has been known since Oken's experiments on *Lymnæa auricularis* more than a century ago. A number of other species have since been shown to behave in similar manner. K. Ikeda (*J. Sci. Hirosima University*, March 1937) has conducted extensive and carefully controlled investigations into this phenomenon in the slug, *Philomycus bilineatus*. The young hatched in spring do not become mature until autumn, so need not be isolated until then; they mate in autumn but the eggs are not laid until after awaking

from hibernation in spring. The discovery of albino forms allowed a certain amount of genetical analysis. The fertility of the egg results from self-fertilization and not from parthenogenesis, and the power of self-fertility does not diminish with age. The individual spermatozoa descend the genital duct to attain fertilizing power in the receptaculum seminis, and the varying degrees of self-fertility exhibited by different species possibly result from differences in the ability of the spermatozoa to migrate through the duct.

Larvæ of Indian Coleoptera

IN *Indian Forest Records*, **11**, No. 9, Mr. J. C. M. Gardner, of the Forest Research Institute, Dehra Dun, continues his series of articles on the immature stages of Indian Coleoptera. The present contribution deals with various Carabidæ, or ground beetles, and includes descriptions of the larvæ of species belonging to eighteen genera of these insects. As a number of these genera are European, and the structural characters of their larvæ are figured, the paper is of interest to workers other than those studying the Indian fauna. Very little has been published previously on larvæ of the Indian members of the family, and the present article, it is hoped, will be followed by others of a like character.

Aquatic and Marsh Plants of India and Burma

MR. K. P. BISWAS described some aquatic and marsh plants of India and Burma in a paper read before Section K (Botany) at the meeting of the British Association on September 7. India and Burma contain an enormous stock of aquatic and marsh plants in their many stationary and flowing waters. The hill streams in the Himalayas have their beds often covered with *Batrachospermum* and *Sirodotia* sp. The coastline, both the Malabar and the Coromandal, harbour large quantities of different species of marine algæ. But there is still a vast field for the investigation of the marine flora of the coastline of India and Burma. The Andaman Islands, the Mergui Archipelago have also a rich vegetation of marine algæ, chiefly composed of *Caulerpa*, *Sargassum* and *Halimeda*. The estaurine areas are marked by dense mangrove vegetation exposed to tidal action. On the west coast *Ceriops Roxburghiana*, *Avecinnia alba* are predominant. In the east, *A. officinalis*, *A. alba*, *Bruguiera gymnorhiza*, *Rhizophora mucronata*, *Acanthus illicifolius*, *Agecerus majus*, *Ceriops Roxburghiana* are dominant species. In the Sundribun down to Mergui Archipelago and farther south the two palms, *Phœnix paludosa* and *Nipa fruticans* form quite a striking feature along the shore and deltaic areas. The larger rivers do not as a rule support much aquatic vegetation; but during hot months some portions of the beds of the rivers partially dry up, forming shallow pools separated from the main body of water. These pools form good culture beds of algæ. Stationary water in the form of natural or artificial lakes, jhils, bils, tanks, pools, puddles and swampy areas (ricefield swamps) occupy a considerable area of the lower plains of the two countries. These, due to favourable edaphic and climatic conditions, are full of aquatic and marsh vegetation. In this mass of crowded vegetation, four zones can be distinguished: (1) the bottom layer, which may be called the zone of the vital layer; (2) the zone of rooted aquatics; (3) the zone of suspended vegetation, and (4) the zone of surface vegetation. The inland brackish water plants are interesting, too. Such plants are often found in the plains of the cities near the sea, such as Bombay, Calcutta and Madras. The salt lakes of Calcutta retain a mixture of salt-water and freshwater vegetation in their swamps.

Polyporaceous Fungi

THE behaviour of nuclei in the developing basidium of the higher fungi has only been studied intensively during comparatively recent years. It has been generally established for one or two agaricaceous fungi that two nuclei fuse in the young basidium; the fusion nucleus divides, first by reduction division, and later by ordinary mitosis, to form the basidiospores. Dr. S. R. Bose adds welcome confirmation to this view, by showing that the Polyporaceæ possess a similar mechanism (*J. Ind. Bot. Soc.*, **16**, No. 3, 119–128; 1937). Eleven species of Polyporaceæ have been studied, and results are given in detail for each species. Basidia are very small in the pore-bearing fungi, but a sufficient number of stages has been found to establish similarity of behaviour with other previously described Basidiomycetes. The mechanism of nuclear division is essentially similar to that of higher plants, though the chromosomes are too small to be counted satisfactorily. Dr. Bose has recently published a paper on "Polyporaceæ from Lokra Hills (Assam)" (*Ann. Mycologici*, **35**, No. 2, 1937), in which he describes a number of species from an elevation of 5,000–10,000 feet. Many cosmopolitan fungi are included, and the accounts show that several polypores of temperate Europe and North America are found at this elevation in Assam, but are absent from the plains of Bengal. *Fomes fomentarius* is a typical example of such distribution.

A Dune Drainage System

MR. V. J. CHAPMAN has described an investigation made in 1933 to determine the nature of the water-table movements in the salt marshes of Scolt Head Island on the Norfolk coast (*Mem. and Proc. Manchester Lit. and Phil. Soc.*, Session 1936–37). The area selected was especially convenient for the experiment as there is a small artificial pond near the centre, and it was the rise and fall of the water in this pond that prompted the investigation. The information obtained showed that while the diurnal tidal movements did not sensibly affect the level of the pond, it rose appreciably and rapidly about 48 hours after every maximum spring tide which reached a height of 27 ft. above Hull datum and then fell slowly. Particulars were also obtained showing the direction of the drainage flow. These water-table movements have a profound bearing on the plants which grow in the dunes and which, in order to tap the supply of fresh water known to float on top of the salt water, develop long roots. Without these periodic fluctuations of the water-table many of the dune plants would not be able to exist in summer when their need of water is great. To this extent, it is suggested, the flora of dune hollows may be associated with and dependent upon the subterranean water supply, assisted possibly by some capillary action in the sand. The conclusions reached as a result of this short investigation agree with those of earlier research carried out at Blakeney Point, and are therefore thought to be representative of the conditions in dunes in this part of Norfolk. These are that no flow takes place until the high spring tide reaches a

certain minimum level, that then a rapid rise takes place after a lag of 48 hours and that, except at these very high tides, the water drains out along the line of least resistance following a shingle path to the shore.

Meteorological Connexions between Greenland and Europe

AT a meeting of the Royal Meteorological Society held on June 16, Dr. F. Loewe read a paper entitled "A Period of Warm Winters in Western Greenland and the Temperature See-Saw between Western Greenland and Central Europe". He referred to the studies of Grosse, Wagner and Scherhag on the marked change that has taken place in the climate of Greenland since about the beginning of the present century in the direction of milder winters and slightly warmer summers, resulting in a decrease of the mean annual range and therefore in a more oceanic climate. For example, the average difference between the extreme seasons from 1923–34 at Jakobshavn was 19·5° C. compared with 24° C. for the period 1876–1934. A striking individual instance of winter warmth is that of the period January–March 1929 when Jakobshavn temperature was 12·7° C. above the 1876–1935 mean, and the coldness of the same period in northern Germany (it was the coldest winter probably since 1830 and certainly since 1838) illustrates the see-saw of temperature with which the second part of the paper deals. This see-saw effect was pointed out by Hann so long ago as 1890, who observed that in the winter months the anomalies of temperature at Vienna and Jakobshavn were of opposite sign, but Dr. Loewe finds that the contrast with west Greenland is greater for the region around the Baltic than for Vienna. He gives a table of temperature anomalies for the nine warmest and nine coldest winters at each of the three stations, Jakobshavn, Breslau and Uppsala, for the period 1876–1930, and the corresponding anomalies at the other two stations, which illustrates the effect very well. The 54 sets of figures contain only two years, 1916 and 1930, with big simultaneous positive anomalies on both sides of the North Atlantic. The main reason for the see-saw is clearly to be found in pressure conditions between Greenland and Norway, high pressure tending to bring polar air down to the Baltic and tropical air up to West Greenland, and low pressure in the same area a reversed exchange of tropical and polar air.

Fluoroform

A MINUTE amount of a substance which was probably fluoroform, CHF_3, was obtained by Meslans in 1894 by the interaction of iodoform and silver fluoride. It was prepared in a pure state by Ruff in 1936 by the interaction of iodoform with a mixture of mercurous and calcium fluorides. A. L. Henne (*J. Amer. Chem. Soc.*, **59**, 1200; 1937) has now described a method suitable for larger scale preparation. In this, bromoform is heated in a closed steel vessel with antimony fluoride (SbF_3) and some bromine. This gives the substance CHF_2Br, b.p. −14·5°. This is carefully purified and is then treated with mercuric fluoride in a similar apparatus, with special temperature control. The gaseous CHF_3 evolved is collected over water, condensed by liquid air and distilled through a condenser cooled at −80°; CHF_3 (b.p. −88·2°) passes on. The substance is very inert chemically and physiologically. Alkalis and acids are unaffected by it, bromine does not react in bright sunlight, but fluorine reacts vigorously with formation of CF_4 and HF. The atomic distance between the carbon and fluorine atoms (as measured by L. O. Brockway) is 1·35 A. By the action of chlorine in bright sunlight, hydrogen is replaced and $CClF_3$ formed. This boils at −81·1° and, as CHF_3 boils at −82·2°, it is seen that in these compounds a replacement of hydrogen by chlorine has caused a rise in boiling point of only 1°.

Effect of Pressure on Phosphors

IT is well known that powdering a phosphor results in a diminution of the intensity of the light emitted, but that uniform pressure produces no change in the intensity. Smekal's theory gives a satisfactory explanation of the effect of powdering. A comprehensive investigation of the effect has now been made (N. Riehl and H. Ortmann, *Ann. Physik.*, [v], **29**, 556; 1937). It was first shown that powdering does not affect the specific gravity of either zinc sulphide or alkaline earth sulphide phosphors. An attempt was then made to determine the percentage of active centres which are rendered inactive by the effect of pressure, the work being confined to the zinc, calcium and strontium sulphide phosphors. The opinion is expressed that the absolute effect of pressure was widely overstated in the earlier work, the reason being that the transparency of the phosphorescent layer was greatly decreased by powdering. For a medium-powdered phosphor it is estimated that the effect is only to reduce the intensity of the emission by 10 per cent, and this is near the limit of accuracy of the experiment. For an extremely finely powdered phosphor the diminution was only about 36 per cent. A rough estimation of the number of centres which come to the surface on account of the powdering agrees well with the experimentally determined decrease in intensity.

Spectrum of Nova Herculis

A LARGE number of papers on the spectrum of Nova Herculis has appeared since the discovery of this star in 1934, but one of the most complete and detailed accounts is that published recently by D. B. McLaughlin (*Pub., Obs. of Univ. of Michigan*, **6**, No. 12). The method of presenting the observational material is worthy of note, since the author discards "that most deadly of methods of discussion: the day-to-day journal of observations" and divides the history of the nova into typical stages, with separate treatment of each stage as a unit. Day-to-day changes of more important characters are, however, to be found in the numerous tables or diagrams. Wave-lengths, identifications, intensities and radial velocities are given for each group of absorption or emission lines which occurred in the various stages considered, together with critical accounts of the main features typifying each stage. It is impossible to summarize the many interesting results obtained, but special mention might be made of the anomalous behaviour of the Mg II line at 4481 A., which showed radial velocity changes at variance with those of all the other absorption lines. It is described as "one of the most remarkable enigmas of the Nova spectrum". Some correlations are found between spectral changes and luminosity, and a tentative hypothesis is offered in which an interesting variant of the expanding shells hypothesis appears to give a satisfactory physical interpretation of the principal features observed.