RESEARCH ITEMS

Blood Groups among Primitive Peoples

THE British Association Research Committee on Blood Groups among Primitive Peoples, of which Prof. H. J. Fleure is chairman, reported at the Dundee meeting on its work during the year 1938–39. Results obtained by Dr. F. W. Vint in Nairobi, Kenya, in 1936, which it has not been possible to carry further, are recorded as follows: Individuals tested, 121 (Bantu, 73; half-Hamites, 5; Nilote, 33; mixed, 10); percentages: *O*, 42·1; *A*, 22·3; *B*, 30·6; *AB*, 5. In the Naga Hills, Assam, from observations in 1936–37, 407 tests were made in all. Of these 140 were of Angamis, Lhotas, Rengmas, and Semas, known historically to be of similar stock. They gave the percentages, Angamis, *O*, 35·4, *A*, 34·4; *B*, 25·0; *AB*, 5·2; while all four tribes together gave, *O*, 40; *A*, 33·6; *B*, 22·1; *AB*, 4·3. The percentages for the four tribes together do not differ appreciably from those for the Angami alone. Larger numbers are required to determine whether Semas, Lhotas and Rengmas show significant differences. Three other tribes were tested as follows: Konyaks (127): *O*, 45·7; *A*, 40·2; *B*, 10·2; *AB*, 3·9; Aos (57): *O*, 47·4; *A*, 22·8; *B*, 22·8; *AB*, 7·0; Thado Kuki (83): *O*, 19·3; *A*, 30·1; *B*, 32·5; *AB*, 18·1. These results accord with the view of Mr. J. P. Mills that the Konyaks are more primitive than the Angami-Rengma, that the Konyak and Aos have much more in common, and that the Thado Kuki are an entirely different race. The Konyak and Aos may be regarded as the most primitive in blood grouping. In Travancore 171 Kannikars, as well as Pulayas and other tribes, have been tested with results markedly different from the general population of Trivandrum. Anthropometric measurements and blood group tests have been carried out on 1,000 Egyptians of the Sharqiya Province, Upper Egypt; and 300 tests have been made in Co. Antrim, Northern Ireland, on individuals with a residential history in the district of three generations, to show whether local differences can arise in a small isolated population.

Alsea Ethnography

THE Alsea, like other coast Oregon groups, have suffered both a decline of their numbers and a shattering of their culture under the impact of white civilization. At the time Philip Drucker collected data of their culture in 1933 (*Univ. California Pub. Amer. Ethnol. and Archæol.*, 35, 7; 1939) three persons only remained cognizant of their languages and customs; and from them these particulars were obtained. The Alsea territory comprised the two short river valleys of the Alsea and the Yaquina, and the ocean frontage between them. Adjoining to the north were the Salishan Tillamook; to the south the linguistically related Siuslaw and Lower Umpqua. They were never numerous. Their culture was definitely peripheral, possessing the broader outlines of Northwest Coast culture, but lacking the refinements of the focal civilization. They were off the main lines of communications, along which many complexes were diffused. They were a fisher folk, their choice of dwelling-sites, their seasonal migrations, and their technological interests reflecting the importance of this pursuit in their lives. Salmon ranked first of the several kinds of fish taken. Dried, it was the mainstay, which provided a winter of leisure to a people lacking a plentiful and easily preserved food source. Other fish and game only supplemented this diet. Of a full list of fishing devices, traps and harpoons were regarded as the most effective. Traps were used in conjunction with weirs. Dip-nets—conical sacks—were used. The salmon club was indispensable. Hunting was considered an adventurous way of supplementing the fish diet. Probably there were many who rarely hunted. Elk were hunted in the fall. Dogs were used to hold the elk at bay until the hunter came up. The paucity of hunting devices emphasizes the lack of interest in any pursuit other than fishing.

Behaviour of Tsetse Flies

UNDER the title of "Studies in the Physiology and Behaviour of *Glossina morsitans*", R. W. Jack, chief entomologist for Southern Rhodesia, gives a detailed account of observations made upon this species of tsetse fly (Mem. Depart. Agric., Southern Rhodesia, No. 1, 1–203; 1939). It embodies, in the main, the results of laboratory research, but certain field data are also included. It is evident, according to the author, that *Glossina morsitana* can thrive under a relatively wide range of conditions, given an adequate food supply. The only extremes of climatic conditions which might exclude *G. morsitans* from extensive tracts of country appear to be too low a mean temperature, which retards reproduction below the survival limit, and too high a maximum temperature especially if it is associated with an inferior cover of vegetation. Interference with the food supply is undoubtedly the best general method of eradicating this insect. It is possible, and economically feasible, in Southern Rhodesia to clear any kind of country of *G. morsitans*, but only at present at the expense of the wild game. With the object of finding alternative measures which can be used over wide areas, it is necessary to continue both laboratory and field research. Not enough is known to combat the fly in its habitat and at the same time to spare the game. A large proportion of the country in Southern Rhodesia infested with *G. morsitans* is relatively sterile, largely waterless, mostly unfit for Europeans and only capable of supporting a very scattered native population. Such areas constitute the major problem because, unless they can be cleared of the tsetse fly or shut off by an effective barrier, they will remain a constant danger to more valuable land where it may otherwise be possible to control the situation.

Replacement of Fangs in Rattlesnakes

THE functional fangs of rattlesnakes are changed or replaced periodically, such replacement occurring whether the discarded fang has been damaged or is still intact. Laurence M. Klauber describes the method of replacement (*Occasional Papers*, No. 5, *San Diego Soc. Nat. Hist.*, Aug. 1939). There are two maxillary fang sockets on each side of the head, and these are used alternately as the site of the functional fang on that side. The next replacement fang always lies behind the vacant socket, in which it becomes anchored by the solidification of a bony

pedestal when the time for replacement arrives. Replacement on the two sides of the head is not synchronous, but at the time of replacement there is a short period when the new fang and the one which will shortly drop out are both functional. Fang change is so frequent that only during the period of most rapid growth in the largest species can a difference in length be detected between a fang and its next replacement. The author also describes and illustrates the method by which the maxillary is rotated so that a fang can be translated from a resting position against the roof of the mouth to a striking or biting position perpendicular thereto. He notes that the fangs are particularly well adapted for biting rather than merely for striking.

Larval Trematodes in Molluscs

AN exhaustive memoir by Dr. Annie Porter on the larval Trematoda found in certain South African Mollusca, with special reference to schistosomiasis, was published in 1938 by the South African Institute for Medical Research (No. 42, 8, Johannesburg). The memoir is zoological, and describes very fully the life-history of *Schistosoma hæmatobium* and *S. mansoni*, their intermediate molluscan hosts, experiments on transmission, and methods of control—an invaluable survey for the medical man and the parasitologist. In South Africa the vectors of *S. hæmatobium* are the snails *Physopsis africana* and *P. globosa*, while *S. mansoni* is carried by *Planorbis* (? *Biomphalaria*) *pfeifferi*, *Physopsis africana* and *Bulinus tropicus* (Cf. Mozley's paper on the fresh-water molluscs conveying schistosomiasis in Tanganyika, NATURE, 143, 951; 1939). Dr. Porter was able to obtain all stages of the parasites from egg to adult, and successfully carried out artificial infection of the snails by miracidia, and of rats and puppies by cercariæ obtained from the snails. She also investigated the penetration of the skin by the cercariæ in native children bathing in infested pools. She concluded that persistent education, treatment of sufferers and mollusc control are the most effective methods of reducing the incidence of both urinary and intestinal forms of this terrible disease. Shorter accounts of other species of Schistosoma follow. The greater part of the book is taken up with descriptions of cercariæ, mostly of unknown parentage, collected by the author from South African snails and studied alive. The eighty-one plates drawn from living material are to be commended for their excellence.

Caridea of the John Murray Expedition

SEVEN new species of Caridea have been described by W. T. Calman and eighteen recorded for the first time from the area traversed by the *Mabahiss* (British Museum (Natural History). The John Murray Expedition 1933–34. Scientific Reports, 6, No. 4. Crustacea: Caridea. 1939). Most of the sixty-seven species identified were from deep water and include some particularly interesting forms. One new species of Plesionika, *P. minor*, has epipods on the first two pairs of legs only, thus being intermediate between Plesionika and Parapandalus. *Parapandalus filipes* n.sp. is peculiar in having the fourth and fifth legs very long and of "thread-like tenuity", the propodus being excessively attenuated and the dactylus microscopic. Two new Pontoniids, both found in association with sponges and referred to the genus Periclimenes and to the sub-genus Periclimenœus and Ancylocaris respectively, are very much alike, and the second resembles *Periclimenes* (*Periclimenœus*) *robustus* of Borradaile in its massive claws, the armature of the fingers and the short thick claws of the walking legs. It is possible that Borradaile's species may also be associated with sponges. *Periclimenes* (*Ancylocaris*) *crassipes* is the only one of these three with simple claws on the walking legs, but otherwise resembles the others very closely; this supports the suggestion of Kemp (1923) that Periclimenœus may not deserve to be even a sub-genus. None of the three has a hepatic spine, which seems to be a further reason for placing them together.

Vegetation of a South Westmorland Fell

THE district described by Alwyn Bennett (N. W. Nat. Union Year Book 1936–37, 19–48) lies between Burton-in-Kendal and Hutton Roof, and its chief ecological interest lies in the close proximity of limestone and acid gravel drift. The glacial drifts, formerly covered by oakwoods, are now, as a result of deafforestation and subsequent grazing, largely covered with bracken, which is actively spreading on land gone out of cultivation. Changes in the ground flora consequent upon the eradication of bracken by cutting and burning are outlined. The limestone area shows stages in development of closed communities from bare scree slopes to grassland or gorse scrub. A flora rich in species is present in the deeper crevices of the limestone pavements, which afford protection from grazing and conserve moisture. The filling of the crevices with humus leads finally to the development of grass heath corresponding to that of the scree slopes, which may later be invaded by bracken or juniper. Grazing pressure prevents the final succession to ash wood. Some statements referring to the wider distribution of certain species require correction. *Asplenium viride* is said not to be recorded in Ireland. It occurs in 30 per cent of the Irish vice-counties. *Dryas octopetala* is wrongly stated to occur on Ingleborough, whilst *Actæa spicata* is not, as stated, absent in Westmorland, but is recorded from the same limestone formation within six miles of the area studied.

Principles of Plant Geography

THE wide scope of plant geography and the varied methods of phytogeographical research are summarized by W. B. Turrill in a paper based on a series of lectures delivered at Westfield College (*Kew Bull.*, No. 5; 1939). The distribution of the main types of world vegetation is determined by climatic factors, principally temperature and precipitation, similar climates giving rise to plant communities with similar physiognomy, for example, the Mediterranean macchie and Californian chaparral. The distributional area of cultivated crops is also a valuable indication of natural conditions, and the areas in which they show maximum diversity have been used to determine their centres of origin. Distribution of the taxonomic units is discussed under physiographic, climatic, edaphic, biotic and historical headings. Other "inherent and miscellaneous" factors which influence distribution are cytogenetics (the distribution of polyploids, for example, often differs from that of diploids), plasticity of species, structural adaptations permitting survival of plants during unfavourable seasons, seed and fruit dispersal and seed setting. The last includes internal and external factors such as carbohydrate-nitrogen ratios, photoperiodism, pollination mechanisms, environmental control of seed

ripening and cytogenetic factors for fertility and sterility. Brief reference is made to the determination of past and present migration routes and the theories of continental drift, age and area, and tolerance.

Hot Water Treatment of Iris Bulbs

IT is now a standard practice to heat most kinds of bulbs for three hours in water at 110° F. to combat attacks of eelworm. Iris bulbs have not usually been subject to the pest, but W. Buddin recently described a considerable attack of this plant by the stem eelworm *Anguillulina dipsaci* (*J. Roy. Hort. Soc.*, 64, Pt. 9; September 1939). He applied the usual heat treatment for the comparatively short period of 50 min.; but even this slight operation had the unfortunate result of diminishing the flowering capacity of the bulbs. Exposure to the hot water for 25 min. had little effect upon the bloom, but was of doubtful value for control of the pest. It remains to find a critical length of treatment between 25 and 50 min., where the pest will be controlled, and the flowering not markedly reduced. Lowering of the floral vigour appears to be a direct lethal effect of the hot water, for increased exposure killed the vegetative parts also.

Spiral Structure in *Osmunda regalis*

I. MANTON (*Phil. Trans. Roy. Soc.*, B, 230, 179–215; 1939) shows that the chromosomes of *Osmunda regalis* provide excellent material for the analysis of chromosome behaviour. The haploid number of chromosomes is 22 and all have terminal or subterminal centromeres and are similar in size. The number of coils at the first meiotic division is 4, at the second meiotic division is 8 and during mitosis is between 12 and 16. The coils are in equilibrium and exhibit no signs of torsional strain during meiosis. The author is of the view that the chromosomes exhibit high elasticity. Measurements indicate that the chromosome length remains constant throughout mitosis, but that at leptotene the thread is about 50 per cent longer, and at first meiotic metaphase 33–50 per cent shorter, than at mitosis. A hypothesis utilizing the apparent similarity to a proteinaceous elastic fibre in the α, β and supercontracted state suggests that the straightening of the molecular contractions at leptotene is a causal factor in chromosome-pairing.

Genetic Construction in Triticum

L. SMITH (Univ. Miss. Research Bull., 298; 1939) describes 56 mutants resulting from the X-raying of *Triticum monococcum* var. *vulgare* and var. *flavescens*. Only 9 of these 56 viable mutants had been found in untreated material. Among the genes were some which controlled the development of chlorophyll, of anthers and sporogenesis, while others influenced colour, hairs, stiffness of leaf and other characters. Ninety-seven combinations of genes have shown that there was no linkage between them, while nine pairs are closely linked, four (involving six genes) being very closely linked.

Thermal Properties of Water and Steam

Two papers by N. S. Osborne, H. F. Stimson and D. C. Ginnings (*J. Res. Nat. Bureau of Standards*, 23, 197, 261; 1939) describe measurements of the heat capacity and heat of evaporation of water in the range 0°–100° C., and the calculation of the thermal properties of saturated water and steam. The papers include a careful critical examination of previous work. The second paper contains extensive tables. It may be mentioned that the value for the latent heat of evaporation at 100° found is 2256·30 internat. joules per gm., and that the specific heat values accord better with the results of Rowland, Laby and Hercus, and Jaeger and von Steinwehr, than with those of Callendar and Barnes. The new data affect the accepted values of the saturation properties of water and steam in the whole range up to the critical region.

Vapour Pressures of Sulphuric Acid Solutions

SOLUTIONS of sulphuric acid should be suitable as standards in the isopiestic method of investigating the thermodynamic properties of aqueous solutions in the higher concentration range, and S. Shankman and A. R. Gordon (*J. Amer. Chem. Soc.*, 61, 2370; 1939) describe some measurements of the vapour pressure of sulphuric acid solutions at 25° for concentrations of 2–23 molal by the static method. The results are in good agreement with previous vapour pressure measurements up to 8 molal, and with electromotive force measurements up to 3 molal. At higher concentrations the vapour pressure and electromotive force measurements are in definite disagreement. A possible explanation is that the cell reaction in the case of the electromotive force measurements is not that postulated. The authors have calculated the activity of the water and the activity coefficient of the acid at various round values of the concentrations.

Reinforced Concrete Research

THE eighth of the studies in reinforced concrete made at the Building Research Station (Dept. of Scientific and Industrial Research, Building Research Technical Paper No. 25. H.M. Stationery Office. 1*s.* 3*d.* net) deals with the strength and deformation of reinforced concrete slabs subjected to concentrated loading. Various tests were made on slabs, 6 ft. × 6 ft. × 4 in., 12 ft. × 6 ft. × 4 in. and 6 ft. × 9 in. × 4 in., the concrete mixture in each case being 1 : 2 : 4 by weight, water-cement ratio 0·62 by weight, giving a slump of 1 in. to 1½ in. At low loads, before the incidence of cracking, the slabs deformed in accordance with the theory of the elastic homogeneous plate. After the incidence of cracking under higher loads, considerable redistribution of moments was apparent and the ultimate loads were about twice as great as the values calculated by the elastic theory for square slabs and 1½ times in the case of rectangular slabs. Hence the design of reinforced concrete bridge deck slabs on the usual basis of the elastic theory is conservative for the case of point loading under static conditions, since the high theoretical stresses in the neighbourhood of the load are considerably reduced as a result of plastic deformation at high loads. While this conclusion bears the satisfactory inference that the theory is a safe basis of design, it has been pointed out that the mechanics of slab action after the incidence of cracking are so complex that no alternative method of design is at present suggested. It is also mentioned that in this investigation the deflections of the supporting beams were so small that they were considered as not seriously affecting the moment distributions. In practice, however, the yielding of the supporting beams may be of considerable importance in this respect.