Research Items

Indians of the Copper River Delta, Alaska

A DETAILED record and analysis of the culture of the Eyak Indians by Dr. Kaj Birket-Smith and Dr. Frederica de Laguna ("The Eyak Indians of the Copper River Delta, Alaska", *Kgl. Danske Videnskabernes Selskab*. København: Levin and Munksgaard, 1938. Pp. 592+18 pl.) is based mainly on observations made during an expedition to Prince William Sound in the summer of 1933. The Eyak, it had been estimated in 1930, were distinct from Eskimo, Tlingit and the Atna, or Athapascan-speaking tribes of the Copper River Valley. The hypothesis then suggested that they were a group of the Athapascans who had come from the interior down the river is here tested and discussed in the light of intensive ethnographic study. Eyak culture is an extremely complicated thing, as might be expected from their geographical situation on the borders of three or four of the principal culture areas of North America, and close to the main cultural gate between the two hemispheres. The basic structure seems fairly clear. More than eighty Eyak elements, namely, 45 per cent of the 183 traits studied, are classed with the ice-hunting culture. They belong to all phases of human life, comprising dwellings, dress, conveyance, house utensils and tools, hunting methods and weapons, magic and religion, etc. The elements of the snow-shoe culture, on the other hand, are exceedingly few in number and of a casual character. This culture can never have been adopted as a whole. The analysis of Eyak culture adds strength to the evidence of a circum-Pacific culture stream, as 27 of its elements seem to belong here. Further, the greater part of the 22 Tlingit elements must be included among circum-Pacific traits, as in most instances they are elaborations of Old World forms, which have drifted back to the north. The origins of the remaining elements can be classified roughly as follows: Asiatic without belonging to any well-defined complexes previously mentioned (9 elements); Eskimo Thule culture and north-west coast, chiefly from the southern area of the latter (7 elements); Eskimo Thule traits (10 elements); North-East Coast and Plateau, or in a few cases only, the latter (17 elements).

Blood-groups in India

IN a paper on the blood-group distribution in India (*J. Genetics*, 36, No. 2) Dr. Eileen Erlanson Macfarlane discusses previous results and adds new ones from different parts of India. Different castes as well as races have been compared, and, as might be expected, the castes differ in their blood groups. The rather small samples indicate that, in Bengal, *A* is similar in different castes, as would be expected if it is of ancient origin; but the percentage of *B* increases and that of *O* decreases in the lower castes. On the Malabar coast these conditions are reversed, the higher castes being highest in *B*. It is evident that *B* has spread both socially, in different castes, and geographically, and it is suggested that *B* may have spread from a single source in north central India during recent millenniums. In Bengal, the Mohammedan blood groups are similar to those of low-caste Hindus in the same region, which accords with the tradition that they were low-caste converts from Hinduism in Moghul times. The relatively low *B* in Cochin is accounted for by the fact that migratory movements from farther north missed the Malabar coast, the lower castes and pre-Dravidians being high in *A*.

Frequency of Multiple Births

MR. ALBERT V. T. DAY, of 180 Kings Highway, Westport, Connecticut, writes to direct attention to the empirical rule connecting the observed frequencies of twin, triplet and quadruplicate births, namely, that approximately one birth in 80 is of twins, one in 80^2 of triplets, and one in 80^3 of quadruplets. He suggests that the discovery of such a consistent rule in inorganic physics would not be treated as a mere mathematical coincidence. If the said rule is a functional expression of some real biological mechanism, its true basic ratio may be 81, derived as 9^2 or 3^4.

Food Pellets of Owls

BY studying the activities of a captive short-eared owl (*Asio flammeus*), Dennis Chitty has added to knowledge of its food habits (*Proc. Zool. Soc.*, Ser. A, 108, 267; 1938). The formation of pellets, it is said, is not due to any special diet or structure of the alimentary canal, and Guérin regards their ejection as a deliberate act the time of which is determined at will by the bird. In the short-eared owl the time of ejection of pellets was found to be related to the weight of the meal previously taken, although as a rule pellets were retained longer at night than during the day. At each ejection the owl completely emptied its stomach, the pellet representing the residue of one or two meals of which the combined weight seldom exceeded 40 gm. Biochemical analysis of the food taken by the owl shows that pellet ejection involves a low percentage of ash, and particularly of calcium in the retained food matter. The data gathered in these experiments have been used to estimate the food requirements of an owl in natural conditions (though the results may be considerably off the mark). It is concluded that in a year a short-eared owl would eat more than 47 lb. of voles and mice, and probably more than 95 lb. but less than 142 lb. Where some relationship is known between the size of owl and vole populations in the same area, this represents a consumption of the vole population by owls at a rate of 0·02–0·05 per cent of the population per day—not enough to make any serious impression upon a vole plague.

Moulds of Blue Cheese

MOULD fungi which can grow under the conditions of low oxygen tension provided by the cracks of certain cheeses are somewhat variable, and many species have been described. It was suggested by Thom in 1930 that all these species were really cultural variants of one, namely, *Penicillium roqueforti*. S. Dattilo-Rubbo has re-examined the question in great detail (*Trans. Brit. Mycol. Soc.*, 22, Pts. 1 and 2, 174–180, Aug. 1938), and his results

substantially confirm those of Thom. A new variety, *viride*, of *P. roqueforti* has been obtained from Blue Cheshire cheese, but this is the only variant of significant permanence isolated from Roquefort, Gorgonzola, Stilton, Blue Vinney, Wensleydale and Blue Cheshire products. Dolce Verde cheese, however, provides an isolated exception, for its organism is related to *P. expansum*, a blue mould associated with the rotting of fruit.

The Pitch-Crust Fungus

A DETAILED paper by W. H. Wilkins (*Trans. Brit. Mycol. Soc.*, 22, Pts. 1 and 2, 47–93; Aug. 1938) gives an account of the spore germination and methods of infection of the common pitch-crust fungus, *Ustulina vulgaris*. This fungus can attack standing timber, and causes subsequent decay. The investigation shows that while spores can germinate upon living trees, penetration is very slow. Dead wood, on the other hand, allows germination and ready penetration, and it is suggested that in Nature the organism is somewhat saprophytic and grows first upon non-living timber. Saturated wood and a temperature above 10° C. for not less than 24 hours are the necessary conditions for spore germination, and the age of the spores is also a potent factor. The optimum temperature for germination is 25–30° C., and the optimum *p*H is 6. Spores germinate upon, and penetrate, ash, beech, elm, horse-chestnut, lime and poplar, but not oak. The collected result of these experiments is, however, considered to suggest the improbability of spore transmission in temperate climates, and other methods must be considered.

New Zealand Forest Fungi

NUMEROUS references to published work upon fungi which attack New Zealand forest trees have been collected by Mr. T. T. C. Birch (*N.Z. J. Forestry*, 4, 2, 1937, or *N.Z. State Forest Service Bull.* 9, 1938). For each fungus species, the New Zealand hosts are given, distribution of the parasite is indicated, a description of the type of damage caused is given, and then the references to published work. It is thus possible to obtain with ease a conspectus of New Zealand forest pathology. Many of the sixty-two species listed are common in Europe, though not always as parasites. *Schizophyllum commune*, for example, is a parasite in New Zealand; but is usually considered a saprophyte in Great Britain. Seven species, the hyphæ of which are probably mycorrhizal, are also mentioned, and beneficial symbiosis of *Boletus luteus* with *Pinus radiata* has been proved by Mr. Birch.

The Earth's Crust

A RECENT paper by Neil R. Sparks ("The Eureka Earthquake of June 6, 1932", *Bull. Seism. Soc. Amer.*, 26, 13–27; 1936) has aroused considerable interest in that the thicknesses of the crustal layers and the velocities of waves in them turn out to be rather different from those determined for Europe. In consideration of this, Stoneley (*Bull. Seism. Soc. Amer.*, 28, 191–195; 1938) has reviewed the observations, determining the standard deviations. He finds the thicknesses of the granitic and second layers to be $12{\cdot}6 \pm 2{\cdot}5$ km. and $12{\cdot}2 \pm 1{\cdot}9$ km., compared with the 16 and 14 km. given in Sparks's paper. The velocities of the P waves in these turn out to be $7{\cdot}15 \pm 0{\cdot}065$ and $7{\cdot}53 \pm 0{\cdot}073$ km./sec. respectively, using Sparks's assumptions. The most recent determination by Jeffreys (*Mon. Not. Roy. Astro. Soc.*, Geoph. Supp., 4, 210; 1937) for European earthquakes is 17 ± 2 km. and 9 ± 3 km. for the thicknesses of the granitic and intermediate layers respectively, and P^* is $6{\cdot}498 \pm 0{\cdot}026$ km./sec.

Absorption of the CH_2 Group near 3μ

IN a previous communication (*Proc. Roy. Soc.*, A, 162, 419; 1937), Drs. J. J. Fox and A. E. Martin recorded observations made on the CH vibrations of some organic compounds in the 3μ region. They indicated that, whilst a CH_2 group in general gave rise to two C–H vibration bands, in some molecules, especially those containing a benzene ring, the C–H units interacted to give several bands. Continuing this work, the same authors have examined a large number of compounds containing CH, CH_2, and CH_3 groups arranged in different ways, and a recent paper (*ibid.*, 167, 257–281; 1938) contains details of the absorption in the 3μ region, of seven compounds in which CH_2 groups are attached to the rest of the molecule by single bonds. By reviewing the data available for ethylene, the authors have been able to explain the CH_2 bands observed in more complicated molecules. When only one CH_2 group is contained in the molecule, the two bands observed correspond to the CH valency vibrations in and out of phase; but as the number of CH_2 groups in the molecule is increased, coupling between them causes an increase in the number of bands. Thus dioxan has four strong bands. Using a model of the formaldehyde type, which approximates to the molecules studied, the observed frequencies can be explained assuming that the CH force constant is $4{\cdot}52 \times 10^5$ dynes/cm. It is found that the mass to which the CH_2 group is attached, and the various other force constants involved, have only slight effects on the position of the CH_2 absorption bands in the 3μ region, except in rare instances where the bonds connecting the CH_2 groups to the rest of the molecule are strained. Compounds containing CH_3 and aliphatic CH groups will be dealt with in a forthcoming communication.

Ultra-Rapid Processing of Radiographs

BY ordinary methods of processing, the minimum time between the taking of a radiograph and the viewing of the finished film is about ten minutes. Development takes five minutes and the remaining time is needed for a quick rinse and sufficient fixing to render the film legible. In certain surgical operations—the Smith-Petersen nail operation is a case in point—frequent radiographs are required for inspection during their progress, and the surgeon is held up while these are being prepared. It is now possible by mean of a process devised by Messrs. Kodak, Ltd., to view the films within one minute after exposure. By the use of the new ultra-rapid developer which this investigation has produced, the development of normally exposed films takes only fifteen seconds. A quick rinse of ten seconds in clean water and fixation for thirty seconds in a special bath complete this stage of the process, so that the surgeon's loss of time is greatly reduced. It is stated that films prepared by this special process can be made available for future reference by giving them a final fix in a normal hardening bath and then thoroughly washing them. The radiographic quality of the films produced by this new method compares well with that obtained under the more familiar processing conditions.