RESEARCH ITEMS

The Yurok

ERIK H. ERIKSON (*Univ. California Pub. Amer. Archæol. and Ethnol.*, 35, No. 10 ; 1943) has described the Yurok, and particularly their childhood and "world image". The Yurok are a small tribe of Indians living on or near the Klamath River in northern California, who have occupied this same territory since the earliest times and who have little contact with other tribes. Their interest centred around the river, being mainly concerned with the salmon, and beyond that the men worked with timber and the women with cultivation. They therefore did not have to alter their ways of life drastically with the coming of the white man, as did many other Indian tribes, and for this reason they offer an instructive field of study. The first part of this publication deals with the training and 'medical' practices of a shamaness. Her early experiences were vividly remembered and have been minutely recorded, with the observer's comments. This is followed by a 'creation' story and the description of the ritual attending the erection of a salmon dam. The second part is an instructive account of Yurok children, from birth onwards, with a note on the value of the training in the formation of their character.

Reproduction of the Robin

IN a short article (*British Birds*, 34, No. 5, May 1946), David Lack describes investigations which show that the British robin rarely breeds in winter. The average clutch increases from early spring until June, after which it declines ; the decline occurs slightly later in Germany than England and distinctly later in Scandinavia. Average clutch-size increases from south to north in Europe and also from west to east. The ultimate factor affecting the survival value of clutch-size is considered to be the amount of food which the parents can collect per day for the brood ; hence day-length is important, though not the sole factor. The proximate factors affecting the physiology of clutch-limitation are not known ; temperature is perhaps important. In completed clutches, about 57 per cent of the eggs laid produce young, but there are marked local variations in hatching and fledging success.

Wildness of Turkeys

A SUBJECT of importance for comprehending the domestication of animals and the survival-rates in the wild has been considered by H. St. Leopold (*Condor*, 46, 133 ; 1945). A close analysis has been made of the differences between the wild Eastern American turkey, the domesticated form and hybrids between them. Despite the fact that farm turkeys can roam at will, they have never been known to become wild. Hybrid turkeys have been released in State refuges with little advantage. By field studies, pen trials, and population studies, the author shows that the wildness of turkeys results from a complex of causes inextricably mixed up with the central and sympathetic nervous systems. Anatomical differences between wild and tame turkeys may be of no significance, but the time of development of wattles and caruncles, time of moult, and limited development of secondary sexual characters would appear to be associated with wildness. The wild condition appears to be essential for survival in the free-living population. Reaction to danger and time of mating are self-protective functions. Tranquillity is unsuited to a wild environment. In a hybrid game-farm population the birds are probably heterozygous for wild factors. Although continually back-crossed to wild males, the selection pressure in a confined group would reduce the most wild types. The direction in which a group will evolve depends on whether it is raised in pens or in the wild.

Experimental Cardiac Hypertrophy

A. N. Drury and K. J. R. Wightman (*Quart. J. Exp. Physiol.*, 30, 45 ; 1940) produced cardiac hypertrophy in rabbits by establishing a fistula between the carotid artery and the jugular vein. Within three months of the operation the heart weight had approximately doubled. Drury (*Quart. J. Exp. Physiol.*, 33, 107 ; 1945) has now shown that this effect is completely reversible. Taking rabbits in which the anastomosis had been present for three months and which X-ray examination showed to have hearts about twice the normal size, he tied off the anastomosis and found that the heart weight returned almost to normal within eight weeks.

Deposition of Air Plankton

FUNGUS spores and pollen grains are deposited in decreasing quantities with increasing distance from a source. P. H. Gregory has examined the mechanics of this dispersal in considerable detail (*Trans. Brit. Mycol. Soc.*, 28, 26 ; 1945). Terminal velocities of spores are generally of the order expected for smooth spherical particles from Stokes's law ; but several observed deviations are believed to be due to surface roughness or asymmetry. Such velocities, however, only apply to the relatively still air near the ground. For major dispersal it is more appropriate to consider a spore cloud in suspension in the air in process of being diluted by eddies in the course of its transport by wind. Theoretical work by Sutton and practical experiments by Stepanov are combined to give an equation for the coefficient of deposition which should be of considerable value in biological measurements. Practical significance of this view of spore dispersion lies in its emphasis upon the elimination of sources of disease within a crop, rather than to any reliance upon isolation.

Home Production of Onion Sets

ONION sets, so useful in certain types of culture of this crop, have hitherto been imported to Great Britain from regions having a warmer climate. M. A. H. Tincker, F. C. Brown, O. V. S. Heath and M. Holdsworth have recently reported (*J. Roy. Hort. Soc.*, 70, 5 ; 1945) that sets can be produced satisfactorily in England. Set production depends on intense competition between closely planted seedlings. The variety 'Ebenezer' appears to be most useful, as it has less tendency than other varieties to flower. Optimum conditions for set production at Wisley involve sowing $\frac{1}{4}-\frac{1}{2}$ oz. of seed per square yard on May 12, on plots 1 yard wide, with adequate soil moisture. Careful weeding in the earlier stages of growth is a necessity, and the use of glass covers facilitates the production of small sets. Nitrogenous manuring does not increase the yield. Sets are harvested when mature, thoroughly dried and graded to pass between $\frac{1}{4}$ inch and $\frac{3}{4}$ inch. Tests of such sets at Cockle Park, Northumberland, and Auchincruive, south-west Scotland, have given promising crops.

Microspecies

O. WINGE (*C.R. Carls. Lab.*, 23, No. 3) has brought to an end his seventeen years work on *Erophila*, the microspecies of which interested Lotsy and Bannier. Winge shows that the microspecies of *E. verna* are all sexual and not apomictic. The forms with similar chromosome numbers cross readily. When a cross is made between forms with different chromosome numbers, the F_1 may be partially sterile, but after seven or eight generations numerous fertile forms with different chromosome numbers are obtained. Winge reports 117 types with chromosome numbers of $n = 7$, 12, 15, 16, 17, 18, 20, 26, 32, 29 and 34. Classification according to ecology, chromosome number and geographical distribution reduces the many microspecies of taxonomy to four. He shows that all have arisen by hybridization, and many more are expected to arise. *Erophila verna* therefore is a cœnospecies.

Sorption on Porous Solids

IN three papers (*J. Chem. Soc.*, 360, 366, 372; 1945), A. G. Foster, partly with D. N. Broad, describes some results on low-pressure isothermals and the sorption of condensable vapours on porous solids. In the first paper an account is given of a new method of calibrating a Pirani gauge for measuring the pressures of condensable vapours up to 0·5 mm. Sorption isothermals for six vapours on silica and ferric oxide gels are in agreement with Langmuir's theory. In the second paper it is shown that with nine vapours on silica gel the adsorbed amounts at saturation decrease as the diameter of the adsorbed molecule increases. The observed relations can be explained by the existence of tapering capillaries in the adsorbent. Gurwitsch's rule, that the volumes of different liquids adsorbed at saturation are approximately equal for a given adsorbent, is shown not to apply to the cases investigated. An explanation is given. The third paper deals with the adsorption of water and deuterium oxide on three adsorbents, on each of which the relative pressure–volume curves for the two liquids are identical. The results are, on the whole, compatible with the capillary theory of adsorption.

Steel Towers for Transmission Lines

IN a paper read by P. J. Ryle in London before the Institution of Electrical Engineers, an empirical formula is derived partly from theoretical considerations, but mainly from practical data, giving the approximate weight of any tower in terms of its height and maximum working overturning moment at the base. The tower weight above ground line is shown to be satisfactorily represented by $kH \sqrt{M}$ tons, where H is the overall tower height above ground line, in feet; M is the overturning moment at ground line, in thousand lb.-ft.; and k is a constant which varies over a range of about 0·0014–0·0029 throughout the whole series of towers; most towers have values of k well within this range. The towers investigated covered ranges of about 16 to 1 in height, 3,000 to 1 in overturning moment, and 1,200 to 1 in tower weight. Design factors which explain variations in the constant k are discussed at some length on a qualitative basis, and it is shown that an economic value for the base width of any tower is in the neighbourhood of $0·5 \sqrt{M}$ ft. On the assumption that, for any given general type of tower, the total erected cost may be regarded as proportional to the aboveground weight, the tower-weight formula, $kH \sqrt{M}$, can be used with convenience and reasonable accuracy for a wide field of cost estimations, especially those involving comparisons of a number of alternatives of a generally similar nature.

Restriking Voltages

IN a paper on the evaluation of circuit breaker restriking voltages by J. R. Mortlock (*J. Inst. Elect. Eng.*, 92, Pt. 2, No. 30, December 1945) it is pointed out that considerable prominence has been given in recent papers before the Institution to the effects of restriking voltages on the performance of circuit breakers; but little guidance has been given to the general determination of these voltages. This paper deals with the approximate evaluation of restriking voltages by the use of equivalent circuits for transformers, generators, etc., and their combination and reduction to a number of standard circuits, the solutions for which are tabulated. The mathematical work involved in any given case has been reduced to routine evaluations. In particular, consideration has been confined to the interruption of 3-phase faults, but the principles can be applied to other types of faults, although these will not give higher voltages.

Origin of the Solar System

F. HOYLE (*Mon. Not. Roy. Astro. Soc.*, 105, 3; 1945) has produced a sequel to an earlier paper (*Proc. Camb. Phil. Soc.*, 20, 256; 1944). In this latter paper he suggested that the solar system originated from a binary star in which one of the components became a nova. The most important requirements that the nova must satisfy are as follows. (*a*) The recoil on the parent star due to the outburst must be sufficiently large to break up the binary system. (*b*) The mass of diffuse gaseous material thrown off in the outburst must be large compared with the mass of the planets, because the high average velocity of expulsion makes it certain that the sun can capture only a small proportion of the total mass thrown off by the star. (*c*) The heating of the diffuse material captured by the sun due to the absorption of radiation from the parent star must not lead to thermal velocities in the material that are greater than the velocity of escape from the sun. The problem is discussed from the point of view of the Crab nebula, the nebulosity of which is believed to arise from the excitation of material thrown off by the super-nova of 1054, the excitation being due to the parent star. Hoyle deals with his assumptions and the observational evidence afforded by the Crab nebula and shows that (*a*) and (*b*) are satisfied. Minkowski has shown that the mass of the diffuse material in the Crab nebula is about fifteen times the mass of the sun, so that there is a large margin of safety in requirement (*b*). Since an appreciable fraction of the mass of the star is thrown off with a velocity of order 1,000 km. per second, an asymmetry of a few per cent in the way in which the material is thrown off in the plane of rotation would be sufficient to satisfy requirement (*a*). The velocity of recoil will be very much less than Hoyle originally supposed, and the time taken for the parent star to recede from the solar system will be much greater than ten days—his previous estimate. The time is now calculated to be about three years, but it is shown that this fulfils requirement (*c*) under certain assumptions.