

RESEARCH ITEMS

Size of Family in Tikopia

RAYMOND FIRTH continues his study of the seasonal rites of Tikopia ("The Work of the Gods in Tikopia", Vol. 2. By Raymond Firth. Monographs on Social Anthropology, No. 2. Published for the London School of Economics and Political Science. Pp. v+189-378+8 plates. London: Percy Lund, Humphries and Co., Ltd., 1940. 7s. 6d.) by completing his record of the monsoon ceremonies and following on with rites of the trade-wind which do not take place in the monsoon. In opening with the text and explanation of a *fono* or public address or proclamation formerly delivered at Rarokoka, he directs attention to a remarkable injunction on population which is included as its closing section. The problem of population seems to have exercised the minds of the people considerably, migration as a means of regulating overflow was barred by size and situation, and this led to a clear apprehension of the dangers of over-population and also to definite types of social mechanism for its prevention. In the *fono* the tendency, owing to human weakness, to over-population was recognized by an exhortation in indirect but clear language to practise certain methods in sexual intercourse to avoid conception, and the size of the ideal family was hammered home, namely, "one male and one female. That is the plucking of the coconut and the filling of the water-bottles". This was an allusion to the allocation of duties in a household in native theory of four individuals, husband and wife, with a son and a daughter, making for correct economic adjustment, without imposing too heavy a strain on food resources. The boy assists the father, doing the more energetic jobs such as climbing trees for coconuts, cutting thatch, etc., the girl helps the mother, especially in keeping the family water-bottles full. If the family is much larger there is an increase in consumption without a corresponding increase in the value of labour power. The alternative to family restriction appears in the *fono* as a query "will the person go and steal?"

Bactericidal Action of Mould Products

It has been known for many years that filtrates from moulds such as species of *Aspergillus* or *Penicillium* may inhibit the growth of many bacteria and in some cases show bactericidal properties. E. C. White (*Science*, 92, 127; 1940) is now investigating the nature of the bactericidal material present in *Aspergillus flavus*. Following on the experiments of Prof. A. Fleming, work carried out at Oxford (E. Chain, H. W. Florey, A. D. Gardner, N. G. Heatley, M. A. Jennings, J. Orr-Ewing and A. G. Sanders, *Lancet*, 239, 226; 1940) has now shown that the substance penicillin which was isolated from moulds is able to exert its influence *in vivo*. Penicillin is only very slightly toxic to mice and rats. It inhibits the growth of several strains of *Clostridium in vitro*. Mice given repeated doses of penicillin were protected against lethal doses of *Streptococcus pyogenes*, *Staphylococcus aureus* or *Vibrio septique*. Penicillin is probably a new type of chemotherapeutic agent and is of interest on account of its low toxicity to animals.

Origin of Frogs

A NEW and important coal measure amphibian from Mazon Creek, Illinois, is described by D. M. S. Watson (*Trans. Roy. Soc. Edin.*, 60; 1940) under the name of *Miobatrachus romeri*. A redescription of *Amphibamus grandiceps*, *Hylonomus geinitzi* and *Eugyrinus wilderi* and a comparative review of these and related forms leads the author to maintain the propriety of the group Phyllospondyli. This order contains four families—the Eugyrinidæ, the Branchiosauridæ, the Melanerpetonidæ and the Miobatrachidæ. These form an ascending series with the Eugyrinidæ linking up at an early stage with the embolomeroous Labyrinthodonts at the one end and the Miobatrachidæ leading on to forms like *Protobatrachus massinoti*, which is an Anuran. Thus while the precise ancestry of neither the Urodela nor Apoda still remain in doubt, that of the Anura has been traced to a family of Phyllospondyli that arose from the Labyrinthodonts in early Carboniferous times.

Crustacean Larvæ

R. Gurney and M. V. Lebour ("Discovery Reports", 20; 1940) have described the larvæ of Decapod Crustacea belonging to the genus *Sergestes* that were collected by the *Discovery*. In two species of the genus the complete life-history was known from previous work. In certain instances peculiarities of the acanthosoma stage enable them to be linked with the mastigopus and so with the adults, but the differences between the elaphocaris and acanthosoma stages are so great that the complete life-history cannot be pieced together from preserved material alone. To overcome this and similar difficulties both authors spent a considerable time at the Bermuda Biological Station. The present memoir provides a description of thirteen species and a key for the determination of their acanthosoma larvæ.

Genetics and Plant-Breeding

J. B. HUTCHISON (*J. Genetics*, 40, 271-282; 1940) has discussed the influence of genetics upon plant breeding. He shows that the introduction of proper statistical methods and progeny-row testing greatly facilitates the work of the breeder and provides a more efficient selection method than mass-selection. Using examples from cotton breeding, the disadvantages of pure line methods are contrasted with the results achieved from selection of mixed populations and with the advantages of land races which although impure from the geneticist's point of view remain stable under the influence of selection of the plant-breeder and of the environment. In an accompanying paper, V. G. Panse (*J. Genetics*, 40, 283-302; 1940) provides methods for the analysis of quantitative characters which will be useful in plant breeding. *F2* plants of hybrids between three cotton strains were grown in a randomized progeny trial. Ten plants of each *F2* progeny were selected at random and an *F3* progeny was grown from these in a particular randomized arrangement. It was found that plot differences partly affect the studied character, staple length, therefore the mean value of each plot must be taken into account when selecting plants for

breeding. It is shown that it is preferable to select plants on the excess staple length over the mean length of the plot. The variance of the progeny may be split up into that due to genetic influences and that due to environmental influences. The variance due to genetic influences may be used to estimate the number of genes which are controlling the segregation of the character being investigated. The possible number of genes, however, is influenced by their dominance and other inter-relationships. Genetics systems may be set up to satisfy this requirement and thus the probable number of genes which control a particular character may be suggested.

Genera of the Pore Fungi

MYCOLOGICAL taxonomy presents many difficulties; it possesses no physiological exactitude, as in bacteria, and is much more at the mercy of varying critical standards of different monographers than almost any other systematic field. Progress must be made by ruthless revision of genera as knowledge increases, and Wm. Bridge Cooke has recently made such a contribution for the Polyporaceæ (*Lloydia*, 3, No. 2, 81-104; June 1940. Lloyd Library and Museum, Cincinnati, Ohio). A historical survey of this section of mycological naming leads, through lists of synonyms and homonyms, towards a practical key to the forty-six genera which it is now proposed to recognize. Many of these have been created to accommodate the polypores of tropical America; but the British student of fungi will find his familiar genera sorted by characters which should be readily distinguishable.

Cornish Tin Mining

THE beginnings of tin mining in Cornwall and the much-debated location of the Cassiterides are discussed by C. E. N. Bromehead in an article on "The Evidence for Ancient Mining" (*Geog. J.*, August 1940). There is sufficient evidence in the form of picks and bronze implements in ancient workings to justify a belief that tin was mined in the Bronze Age. At the time of Pythias, about 325 B.C., the tin trade was already in existence, tin being shipped to the Loire or Garonne and then overland to the Mediterranean. Indeed this trade probably was carried on so early as 450 B.C. Earlier than that, however, it is likely that the Phœnicians sought tin in Britain, perhaps so early as 1000 B.C., by which time certainly they had sailed through the Straits of Gibraltar and founded Cadiz. Contributory evidence is the discovery of Irish gold work of about 1200 B.C. at Gaza, and beads from Brittany of equally early date in the eastern Mediterranean. The Cassiterides, however, remain an unsolved mystery. Bromehead inclines to believe they were a myth designed to mislead contemporaries of the Phœnicians as to the whereabouts of the tin mines. He discards the Isle of Wight but gives a doubtful acceptance to St. Michael's Mount for identification with Ictis, from which the tin was shipped. It certainly is the kind of port which the Phœnicians favoured in other lands.

Earthquakes registered at Hong Kong

VALUABLE data is contained in the Royal Observatory Hong Kong monthly seismological bulletin for April 1940. In this, the time of occurrence of several important phases is given to the nearest second together with the period of the waves and their amplitudes. It appears that during the month 41 earthquakes were registered on the Milne-Shaw seismographs, two of the shocks being stated to be

local ones. The two largest earthquakes were recorded on April 6 at 13h. 45m. 30s. G.M.T. with an amplitude of 11 mm., and on April 16 at 6h. 17m. 8s. G.M.T. with an amplitude of 8.5 mm. In the report there is no mention of microseisms. Perhaps the observatory is fortunate in not being affected by the phenomenon.

Magnetic Properties of the Transition Elements

F. BITTER, of the Massachusetts Institute of Technology, presented a paper on this subject at the annual meeting of the U.S. National Academy of Sciences held during April 22-23. The main objective of this cryomagnetic research was to provide information about electronic configurations and interaction energies in solids. First experiments have been on compounds and alloys of the transition elements chromium, manganese, iron, cobalt, nickel and copper. It is proposed to complete a general survey of these substances from 14° to 1,200° Abs. in large and small fields. By way of illustration, the properties of iron were discussed. α -iron, Fe_3O_4 , one form of Fe_2O_3 , FeS are ferromagnetic; γ -iron and hæmatite (Fe_2O_3) are not. The author's results on FeCl_2 , FeCl_3 , and on alloys of copper containing less than 1 per cent of iron in solution show strong paramagnetism with interesting anomalies at low temperatures. Also an alloy of gold containing 12 per cent of iron in solution, although it has a face-centred cubic structure like γ -iron, is ferromagnetic up to 230° C. (*Bull. Amer. Phys. Soc.*, 15, 20; 1940). The theory of solids is sufficiently advanced to attempt at least a qualitative description of the above facts. Such an attempt can be outlined, starting with assumptions about the Fermi energy resulting from the application of the exclusion principle and about the Heisenberg exchange energy, and then calculating the properties of iron atoms in various geometrical configurations.

Atomic Weight of Iodine

THE atomic weight of iodine is of special interest, for as iodine is a simple element a comparison of the physical and chemical scales may be made through this element with less uncertainty than in the case of a complex element. The accepted value of the atomic weight, 126.932, was found by Baxter from a comparison of silver with iodine. Hönigschmid and Striebel in 1932, by the conversion of silver iodide into silver chloride, found the appreciably lower value 126.917. Baxter and Titus (*J. Amer. Chem. Soc.*, 62, 1826; 1940) have now redetermined the ratio $\text{AgI} : \text{AgCl}$ by heating weighed quantities of silver iodide in a current of chlorine until no further loss in weight occurred, and they calculate an atomic weight of iodine slightly lower than Hönigschmid and Striebel's, namely, 126.915. They point out that silver iodide above its melting point seems to be somewhat unstable in air and even in nitrogen, so that some slight uncertainty exists as to the exact composition of the fused material on which the analyses were made. In a second paper, Baxter and Lundstedt (*J. Amer. Chem. Soc.*, 62, 1829; 1940) also determined the ratio $\text{Ag} : \text{AgI}$ as well as the ratio $\text{AgI} : \text{AgCl}$. It was found that when silver was fused on lime in an atmosphere of hydrogen (Richards's method) slight reduction of the lime occurred and the silver showed calcium lines in the spectrum. The value found is 126.915. It is pointed out that there is some uncertainty about the mass spectrograph value, but the figure 126.915 lies between the value 126.917 found by Hönigschmid and Striebel and the best mass spectrographic value.