RESEARCH ITEMS

Houses of the Sierra Tarascans

"Houses and House Use of the Sierra Tarascans" by R. L. Beals, P. Carrasco and T. McCorkle (Smithsonian Institution. Institute of Social Anthropology, Pub. No. 1) is the first of a new series which is to attempt to reconcile scientific and applied objectives in anthropology. Housing is not only a subject of consideration in social welfare but it is also an important aspect of culture, and is therefore a suitable topic for a study of this sort. The Tarascan Indians of Mexico form a large group of whom not much is known scientifically, though there are records of them from the sixteenth century, when they are known to have occupied much more territory than they do now. Their towns are usually situated on level ground, though there are some mountain villages, and the houses are built of wood or of adobe bricks and stone masonry. House building is done by special workmen and the materials are local; fir, or preferably pine wood is used for the timber and is cut into beams, planks and 'shakes' for roofing. The adobe bricks are made of earth mixed with manure and water to a proper consistency and then shaped in wooden forms; the masonry consists of assorted rocks which are roughly trimmed. Following this description of the materials used, there is an account of the types of buildings: the house, really a storehouse; the kitchen, which sees most of the family life; and the shed for animals or fodder. Cooking is done on a hearth on the ground, with stones (usually six) to support the cooking vessels, which are made of clay. The other house furnishings are on an equally primitive level with the exception of occasional imported implements. The building costs of this type of house are estimated and its ceremonial and social function discussed, and there is also a short historical account of Tarascan houses. The paper is illustrated with drawings and photographs.

Rh Factors and Feeble-mindedness

L. N. Snyder, M. D. Schonfeld and E. M. Offermann (*J. Hered.*, **36**, 9; 1945) have described data which are suggestive that the incidence of feeble-mindedness is significantly correlated with the *Rh* factors. They follow up the evidence of Yarnell and Lieberman with further data. The combined data show an excess of *Rh*-mothers among mothers of feeble-minded children, and of feeble-minded children from *Rh*-mothers. The proof of the effects of the immunization upon brain tissue will depend on the discovery of erythroblastosis and feeble-mindedness in the same family.

Sympathetic System and Water Diuresis

W. J. O'Connor and E. B. Verney (*Quart. J. Exp. Physiol.*, **31**, 393; 1942) have shown in dogs that the inhibition of water diuresis which follows emotional stress is due to the liberation of antidiuretic hormone from the posterior lobe of the pituitary gland. 'Emotional stress' was produced by electrical stimulation of the skin. In further work (*Quart. J. Exp. Physiol.*, **33**, 77; 1945) they found that such inhibition occurred only in about one third of all tests on normal dogs; but in dogs after denervation of the kidneys with section of the splanchnic nerves and removal of the second, third and fourth lumbar sympathetic ganglia on both sides, inhibition occurred in all tests. In such 'denervated' dogs inhibition of diuresis could be prevented by injecting adrenaline just before the application of the electrical stimulus. Adrenaline injection, however, did not affect the inhibition produced by injection of posterior pituitary extract, and so it was concluded that adrenaline acts by preventing the release of antidiuretic hormone from the pituitary. The fact that emotional stress did not cause an inhibition of diuresis in many of the tests on normal dogs could therefore be accounted for in terms of increased sympathetic activity resulting from emotional stress. In the course of this work, O'Connor and Verney observed another type of inhibition of water diuresis which may follow emotional stress in normal dogs. This type of inhibition is much more rapid and evanescent than that due to antidiuretic hormone, and it is completely abolished by section of the splanchnic nerves with denervation of the kidneys and suprarenals. This rapid inhibition is probably due to renal vasoconstriction, though the evidence here is not yet complete.

A Portable Instrument for Recording Human Respiration

A NOVEL apparatus for recording respiration in human beings has been devised by Mr. Ralph Poole, 50 Bedford Square, W.C.1. It comprises an ordinary breathing-mask or face-piece attached by flexible tubing to an air-flow meter. The air-flow meter consists of a light spring-controlled vane working in a suitably shaped chamber. Attached to the vane spindle and moving with it is the secondary coil of a small transformer the fixed primary coil of which is fed by A.C. at 12 volts, obtained by stepdown from the mains. The secondary coil is connected to a recording voltmeter and the induced voltage is proportional to the deflexion of the vane. The air-flow meter is strapped to the subject, and trailing leads connect it to the A.C. supply and the recorder, which may be any distance away. The advantages of this instrument are the negligible resistance offered to breathing and that recording may proceed while the subject is performing any type of work. Unfortunately, its usefulness is limited by the fact that it records only the velocity of tidal movements and not the absolute tidal volumes.

Lettuce Mildew in China

THE fungus *Bremia lactucæ* causes a disease of lettuce and other species of Compositæ, over wide geographical regions. Lee Ling and M. C. Tai have studied the specialization of this fungus in China (*Trans. Brit. Mycol. Soc.*, **28**, 16; 1945). *Lactuca chinensis*, *Sonchus oleraceus*, *Taraxacum mongolicum* and *Crepis japonicus* are all infected with physiological forms of *Bremia lactucæ*, and no interinfection takes place. *Lactuca sativa* and *L. indica* share a further physiological species. *Saussurea affinis* is attacked by a species of *Bremia* with spores much larger than *B. lactucæ*, and is regarded as a separate species, *B. Saussureæ*.

Genetics of Yeast

A varied series of fundamental problems is raised by a further paper on yeast by S. Spiegelman and C. C. Lindegren (*J. Bact.*, **49**, 257; 1945). They show that adaptability to ferment galactose can take place in the haplophase by mutation, and that the absence or extreme reduction of this stage in some species prevents the appearance of these mutations. They also show that there are a few strains which have not mutated in the haplophase towards the ability to ferment galactose, although they mutate freely for other characters. The authors find that the presence of a small amount of glucose is necessary

in the early stages to permit the galactose non-fermenters to start growth and then to be selected for mutations of fermenters of galactose. Little reliance can be placed upon physiological characters for classification in yeast, and there is considerable danger in depending upon yeast for biological assay as has been done for the estimation of galactose in the presence of other carbohydrates. The recent papers upon the genetics of yeast shed light upon the vexed question of neo-Lamarckianism.

Magnesium Chlorosis

T. Walsh and E. J. Clarke have made the interesting suggestion that a chlorosis of tomatoes due to magnesium deficiency should be controlled by attention to the level of potassium, rather than by the addition of magnesium compounds (*J. Roy. Hort. Soc.*, **70**, Pt. 7; 1945). They show that the chlorosis is associated with high values of potash, that its appearance depends largely on the ratio of potassium to magnesium, and that high concentrations of mineral nutrients in the soil lower the yield of tomatoes. There is an increasing volume of evidence, apart from that presented in this short paper, that the tomato crop is often over-manured. Additions of magnesium compounds would only add to this difficulty, and there appears to be sufficient magnesium for good growth in the Irish soils investigated, when the potash is kept at a suitable level.

Carbohydrates in Grains of Wheat Grafted on Rye Endosperm

W. E. Pissarev and N. Vinogradova have succeeded in growing wheat plants by transplanting embryos of wheat kernels on to rye endosperms. The plants were grown until fully ripened and producing seed, which differed from the control in certain morphological features. A. A. Schmuck (*C.R. Acad. Sci. URSS.*, **44**; 1944) has studied the grafted grains biochemically and found them to have only somewhat higher nitrogen and protein content and less starch than the controls; there was, however, a sharp difference between the two in the gluten. The gluten from grafted grain was dark-brown instead of the usual light-pink colour. Further distinction was found in the quantity of trifructosane, $C_8H_{30}O_{15}$, which is practically absent from normal wheat grains but quite considerable in the grafted wheat, as it is also in rye grain. Thus, the grain of wheat grafted on rye endosperm proved to contain a carbohydrase which is typical of rye. The nutrition of the growing scion in the earliest stages appeared to determine the subsequent profound biochemical changes in the mature plant.

Fruit Development in the Peanut

A REPORT from Dr. J. Needham, in China, concerning investigations made by Cherng-How Lou and Chin-Hsu Liu (of the Physiological Laboratory, Tsing Hua University, Kunming, China) on the development of the fruit of the peanut, *Arachis hypogea*, has recently been received. It will be recalled that after fertilization, the 'flower stalk' elongates carrying the ovary downwards, the corolla, with the stamens, having fallen off. The sharp style grows into the soil and the thick pericarp of the pod develops. In the air, the ovary does not develop unless light be excluded. Allard (1932) had previously shown that the related hog peanut (*Falcata comosa*, L.) reacted to controlled periods of daylight in regard to the hypogean flowers and fruits, and the cultivated peanut is in general comparable. Chin-Yueh Chang (University of Peking) has studied the morphological changes in the ovary stalk, or gynophore, leading to the regeneration of meristematic tissue, later concerned with phases of its rapid elongation. The newer investigations deal with the removal of the tip of the gynophore, consisting of the undeveloped fruit and a very short length of the underlying tissues, in all some 2 mm. in length. Using this as a 'scion' they were successful in more than 50 per cent of their attempts to graft the excised portion on to the stems of the cotyledons of seeds starting to germinate; or in other instances on to the cotyledons. Given suitable conditions, union of these tissues took place followed by the growth of the gynophore and succeeded by the development of the fruit in darkness. These cotyledons thus supplied directly, through the gynophoric tissue, nutrients for other enlarging fruits and their seeds. Grafts were not successful when the 'scions' were placed on to similar tissue of lupins, soy-beans, or other related plants.

Effect of Drying on Nitrogen Oxides

IT has been believed that intensive drying with phosphorus pentoxide alters the physical properties (boiling point, vapour pressure, vapour density, and surface tension) of liquids. In the case of dinitrogen tetroxide, an increase of vapour pressure was found, which was ascribed to a shift of the equilibrium $N_2O_4 \rightleftharpoons 2NO_2$ to the right in the liquid. E.M. Stoddart (*J. Chem. Soc.*, 448; 1945) finds that the liquid reacts slowly with the phosphorus pentoxide even at room temperature, forming a compound P_2O_5,2NO and liberating oxygen, which causes an increase of pressure. The dried liquid has a normal vapour pressure. The increase in vapour density reported for vaporized dried dinitrogen trioxide is also due to this compound, which withdraws NO from N_2O_3 and leaves a gas richer in N_2O_4. These results, together with results of other workers on boiling points, surface tension, liquid density and dielectric constant, lead to the general conclusion that drying does not influence the physical properties.

Planetary Perturbations

"La Aceleracion Secular De Los Ejes Mayores De Las Orbitas Planetarias" is the title of a thesis by Alexander Wilkens (*Observ. Astron. Univ. De La Plata, Ser. Astron.*, **18**). As the work contains nearly two hundred pages of which the greater portion consists of abstruse formulæ, it is impossible to do more than indicate the general lines of investigation. The earlier part of the thesis shows how it is possible to develop the elements of a planetary orbit in powers of the perturbing mass and also how differential equations in terms of the third order of the semi-major axis are formed. Then it is shown how secular terms of the third order of the semi-major axis, proportional to powers of the time, t and t^2, are obtained. In the first instance, this is restricted to the cases where the orbit of the disturbing body lies outside that of the perturbed body, and the effect of one planet only on another is considered. Later, however, the thesis shows how the method can be extended to cover the total perturbations of the major planets. Finally, the method for computing the perturbations when the perturbing body lies inside the orbit of the perturbed body is dealt with. The second part shows how the Poisson terms, of the form $t^2 \cdot \frac{\cos}{\sin} A$, are deduced.