

Research Items

Tuberculosis and Inheritance

As part of the laboratory work in connexion with a course in human biology in Johns Hopkins University, Baltimore, Prof. Raymond Pearl initiated a study of family history records with reference to families in which tuberculosis had occurred. Analysis and discussion of the data have elicited some interesting results (*Z. Rassenkunde*, 3, 3). The records examined include 3,608 individuals in the classification of parents and children. Taking all the offspring together, 11.3 per cent were tuberculous, which is in reasonable agreement with the known prevalence of tuberculosis in Baltimore at the time the records were taken. The families average between 4 and 4.6 children. Four types of mating were differentiated and the percentage of tuberculous offspring in each type noted. There were: Both parents tuberculous, 35.7 per cent; father tuberculous, 14.0 per cent; mother tuberculous, 13.0 per cent; neither parent tuberculous, 8.3 per cent. The smoothness and regularity of the results are noteworthy. The incidence in the non-tuberculous parentage is a little more than half that of the tuberculous - non-tuberculous mating. The rates of the two latter types are essentially in agreement, as might be expected theoretically, if it is assumed that tuberculosis is neither a sex-linked nor a sex-limited phenomenon. Further, the full tuberculous mating gives an offspring incidence a little more than four times that from the full non-tuberculous mating. The regular increase in the offspring percentage incidence, as the amount of parental tuberculosis increases, seems impossible of rational explanation on any other basis than that of hereditary influence, as the risk of contact infection is not quantitatively doubled. The risk of infection as between the children of tuberculous and non-tuberculous parentage would seem greater than is indicated by the figures. It seems impossible, with the data at present available, to postulate any simple rational Mendelian formula that will accurately describe the results.

Archæology in Western Colombia

In 1935 Dr. Henry Wassén had the opportunity of examining a number of graves belonging to an ancient Indian settlement on the estate of El Dorado in the western Colombian Cordilleras, midway between Yotoco and Rostrepo in the Department of Valle del Cauca (*Ethnologiska Studien*, 1936, No. 2: Göteborg Museum). Among the objects found in the neighbourhood described, but not found by the author, are two vessels painted in red-brown, of a characteristic shape, the neck rising from a horizontal plane. Three strong handles, adapted for carrying the vessel on the back, are at different levels. This arrangement does not appear to have been recorded previously among archaeological finds in South America, but can be paralleled from Mexico. Further examples were obtained from the graves. Nine graves in all were opened up on four different sites. The type form is a shaft, oblong in section, the long sides orientated north and south, with a recess, or chamber, usually on the north, but here on the south side, elliptical or rectangular in shape. The shaft is

here four to six metres deep, between one and two metres long, and approximating to a metre in breadth. Examples have been recorded in which the shaft is 14-17 metres deep (Cauca) and even so much as 25 metres (Quinidio). The elliptical recess, with its long axis east and west, approximates to a metre in height, two to two and a half metres long and from 0.75 to 1.35 m. in breadth. One recess was a rectangular chamber of considerable size. In one group the recess was scarcely perceptible and not deep-seated. One grave had no recess. Another grave of a distinct type had a square shaft, 6.10 m. deep, with the chamber below the level of the bottom of the shaft, the entrance to the recess being closed by a grinding stone. This had evidently contained the body of a woman, as was shown by spindle whorls. A hair ornament in the form of nippers and a part of a nose ornament, as well as the position of the teeth, indicated that the head had been placed to the north. On analysis the nose ornament proved to be composed of gold (64 per cent), silver (9 per cent) and copper (27 per cent). Green stain on the teeth indicated the presence of copper. The skeletons had completely perished, except for a few fragments and some teeth.

The *Medusæ Eirene* and *Helgicirrha*

DR. P. L. KRAMP clears up much confusion in his paper "On the Leptomedusæ of the Genera *Eirene* Eschscholtz and *Helgicirrha* Hartlaub" (*Vidensk. Medd. fra Dansk naturh. Foren.*, 99; 1936). True cirrhi are absent in *Eirene* but present in *Helgicirrha*, and on this character the genera may be divided. Twelve species of *Eirene* are distinguished here, and five or six species of *Helgicirrha*, the genotypes being *Eirene viridula* and *Helgicirrha schulzei*. A re-examination of material previously identified by the author as *Eirene viridula* shows that specimens from the coast of Belgium and the Straits of Dover (1930) are correctly identified, but the majority of those from the coast of Jutland (1927) belong to *Helgicirrha schulzei*, a few being *Eirene viridula*; those from the Straits of Gibraltar and the coast of Tunis (1924) are *Helgicirrha schulzei*, and those from the coast of Portugal (1910) are *Helgicirrha cari*.

Sponges of the North Sea and Baltic

DR. W. ARNDT in his monograph Porifera (Systematische Teil) in "Die Tierwelt der Nord- und Ostsee", Lief. 27, Teil 3a₁ (Leipzig: Akademische Verlagsgesellschaft m.b.H., 1935) makes a very complete systematic survey of the sponges in these regions. There is a large sponge fauna to be found in the North Sea and Baltic, including representatives of many families. These are all described in detail, with good text figures, whilst useful keys of families, genera and species are given, with instructions for technique for studying living and preserved material, and an excellent bibliography. This most useful work on the fauna of the North Sea and Baltic keeps well up to standard in the present part, which also includes an interesting account of Thalassobionte und thalassophile Diptera Nematocera (Teil 11, e₃) by W. Hennig.

Experimental Neoplasms

THE developing blastoderms of birds and reptiles occasionally exhibit, in the region of the primitive streak, proliferating masses of cells which, while they multiply freely, show no tendency to transform into embryos or embryonic structures. These pathological masses grow with considerable rapidity and exhibit all the characters of neoplasms, and for that reason they have been termed by Tur "neoplasmoides embryonnaires". This author has produced the same type of growth experimentally by means of a thermoelectric cautery (*Bull. Int. Acad. Polonaise*, July 1935). The platinum needle, which becomes white hot, is carried by a mechanism which enables it to be applied accurately to any given point on or near the blastoderm, and also to apply the heat for a definite period. It also allows the heat to be controlled without the loss that would take place in manipulating a heated needle through the albumen layer. After treatment, the aperture in the egg shell is sealed with a cover slip and incubation allowed to proceed. Freshly laid eggs are employed, and the heat applied to the centre of the area pellucida. In this manner, a neoplasm can practically always be produced, and like those occurring naturally they not only exhibit remarkable power of proliferation but also blood elements appear precociously. The author suggests that this phenomenon should be considered in relation to cancer.

Haploids in Cotton

SEA ISLAND cotton produces haploids—known as 'man cotton'—in the proportion of one in three or four thousand plants. This type was described by Dr. S. C. Harland in 1920, but its haploid nature was not recognized until much later. By removing the testas of several thousand seeds of one variety, Harland found (*J. Hered.*, 27, No. 6) that twenty seeds contained two embryos, which yielded in nearly every case one haploid and one diploid seedling. Indian workers have shown that in rice, where a high proportion of haploids also occurs, the same form of polyembryony exists. Such ovules may contain two embryo sacs, or it is possible that the diploid embryo arises from nucellar budding while the haploid develops from a parthenogenetic egg. Many of the cotton haploids are fertile with the pollen of other forms, although some are completely sterile. Harland suggests that if diploids could be produced from the haploids by the decapitation method, the resulting homozygous strains would be of much value in breeding work, especially in cotton, which is a highly heterozygous crop plant.

Control of Downy Mildew of Tobacco

AN interesting method of controlling the fungus disease known as downy mildew, or blue mould, of the tobacco plant, is reported in an account by Science Service from Canberra, Australia. This describes the work of Dr. H. R. Angell, Messrs. J. M. Allan and A. V. Hill, who have shown that early infection can be prevented by raising seedlings in an atmosphere containing vapour of benzol or toluol. Special seed-beds covered with glass have been prepared, and numerous shallow vessels containing the benzol or toluol are placed within. The young seedlings make healthy growth, and when transplanted do not contract the disease. Large-scale field tests are in progress, and their results will be awaited with interest.

The Heat Capacity of Ice

IT has been known for some years that the entropy of ice as given by the integral $\int_0^T C_p d\ln T$ does not agree with the value calculated from the entropy of water vapour as found from its band spectrum, there being a discrepancy of about 1 gm.cal. per degree per mol. W. F. Giaouque and J. W. Stout (*J. Amer. Chem. Soc.*, 58, 1144; 1936) have now redetermined the heat capacity of ice from 16.4 to 267.7° abs. The latent heats of fusion and evaporation are accurately known, and the value of the integral is thus found to be 44.28 ± 0.05 gm.cal./1°/mol. at 1 atm. and 298.1° Abs. The spectroscopic value is 45.10, leading to a discrepancy of 0.82. This is in agreement with a discrepancy of 0.806 calculated by Pauling on the assumption of random orientations of hydrogen bonds in ice, and the supposition that when ice is cooled to low temperatures it fails to attain the ordered arrangement which would correspond with zero entropy. It has been found that ice has no measurable heat capacity between 0.2 and 4° Abs., and the authors state that no difference in thermal properties of ice could be detected in samples prepared by slow or rapid cooling.

Manganese Trichloride

ALTHOUGH the existence of a higher chloride of manganese, probably $MnCl_3$, has often been reported, its existence in the pure state has only recently been demonstrated. A. Chrétien and G. Varga (*Bull. Soc. Chim.*, 3, 1263; 1936) have obtained the trichloride as a brown crystalline mass by acting upon manganic acetate, $Mn(C_2H_3O_2)_3$, with liquid hydrogen chloride at -100° . A violent reaction occurs, and an olive-green liquid is produced. This is evaporated to dryness at the same temperature. The solid may be heated to room temperature in a closed vessel with little decomposition. On heating, it evolves chlorine and leaves a white residue of manganous chloride.

Spectra of B-Type Stars

TWO papers by E. G. Williams on B-type stars have appeared recently in the *Astrophysical Journal* (83, 279 and 305). The first paper describes the spectrophotometric observations of 84 stars over the range 4922–3820 Å. Intensities (expressed in equivalent widths) were obtained for all measurable lines in this range, and in addition line depths were measured for H and He lines. In the case of H and He lines it was also possible to obtain reliable contours, which were observed to be exponential in form except in diffuse-line stars, where the centres were rather blunt. The results of the first paper have been used in the second in an attack on the problem of classification, which presents well-known difficulties in the case of B-type stars. These difficulties, together with earlier attempts to overcome them, are first reviewed by the author, who decides that line ratios, rather than simple intensities, are preferable as criteria of classification. He suggests seven ratios, some of which involve the combination of line intensities from several different elements. The resulting classification is arranged to agree in the mean with the Henry Draper system, but with added subdivisions and with the numbers of stars in each subdivision progressing smoothly with type. Statistical relations between spectral type (as redetermined) and line intensities of various atoms are discussed, and some interesting luminosity effects are also obtained.