

Research Items

Classification of the Races of China

MR. CHUNGSEE H. LIU has attempted a classification of the races of China (*Zs. f. Rassenkunde*, 6, 2; 1937) in which he points out that the Chinese people are by no means a homogeneous unit as commonly supposed and examines critically the classifications of those anthropologists who have recognized this fact. Mongol, Mongoloid and Mongolian, are loose and unsatisfactory terms, and *Homo sinicus* is suggested to replace them. In the Chinese population as a whole, the physical characters are, in general terms: hair universally black, lank or coarse, straight, with almost circular cross-section; body and face hair very scanty; skin varying from yellowish to yellow-brown; eye colour light-brown; setting of eyes horizontal or oblique with epicanthic fold; cheek bones prominent, mesocephalic on the brachycephalic side; nose relatively flat with depressed nasal bones; mesorrhine; medium stature; slender or thick-set, hands and feet small. Within this general description, three types are recognized, which are distributed in accordance with the three great river-systems of China: (1) The Huangho type in the north, mainly found in the valley of the Huangho, the Liao Ho, and the Sungari River in Manchuria. This type is of high stature, dolichocephalic, leptorrhine, and of vigorous physique and robust feature. It is honest and frugal, slow but sure, chivalrous and conservative. The people speak the northern Chinese mandarin, and may be regarded as the archaic type of Chinese. (2) The Changkiang type, mostly confined to the Chang Kiang or Yangtze River valley in a favourable natural environment. This type is of medium stature, mesocephalic, mesorrhine, with light yellowish complexion. The people exhibit great literary power and ability. They speak southern Chinese mandarin with local dialects—the progressive type of the Chinese nation. (3) The Chukiang type in the Chu Kiang or Pearl River valley of southern China, with Fukien as an eastern corridor and Hainan Island beyond the sea. They are of shorter stature, brachycephalic, platyrrhine, of darker skin colour. Mentally this type is vivacious, and adventurous, quick in action and radical in thought. They speak various dialects of southern China.

Skeletal and other Remains from the Virgin Islands

REMAINS, skeletal and other, of the early inhabitants of the Virgin Islands, which had been discovered on Water Island, near St. Thomas, by Mr. A. H. Julien, were collected by Mr. J. S. Trevor in 1936. Burials of about twenty-one persons lay 2–3 ft. below the surface, in direct association with shells of the giant conch (*Strombus gigas*) and other gasteropods, small animal bones, probably those of the Indian coney (*Capromys brachyurus*), lumps of a red ochreous substance, stone implements and pottery. The skeletal remains are discussed by Dr. L. H. Dudley Buxton and the pottery by Prof. Gudmund Hatt of Copenhagen in *Man* of April 1938. As the skeletons had been reinterred, it was impossible to locate more than seven, but the occipital bone of an eighth individual was also found. These are represented by skulls, mostly incomplete, humeri, pelvic fragments, sacra, femora and calcanea, which

are now in the Oxford collection. Measurements have been made by Dr. Buxton, who regards the material as too scanty to give anything but the most tentative results. In 1492, Dr. Charlotte Gower has concluded, there were at least three populations in the West Indies, possessing distinct cultures. These were the Caribs, the Ciboney and the Tains and/or Ygneri. Owing to the lack of any description of the physical characters of the aborigines for comparison, the present material admits of the addition of nothing substantial in the way of argument from the skulls. None of them displays artificial deformation, which is common in the Carib, but is said to be absent in the Ciboney. There is no high cephalic index, though the general tendency of the West Indian skulls is towards brachycephaly. High nasal indices and marked prognathism suggest negroid characteristics, but a secondary interment after the introduction of negro slaves seems unlikely. In his discussion of the pottery, Prof. Hatt affirms that the vessels are of pre-Columbian Indian origin. In form and ornament, the pottery resembles that found previously in St. Thomas and St. Croix. It is probably earlier than the Carib invasion and, therefore, Ignierian, that is, Arawak.

Vascular Anatomy as a Taxonomic Tool

THIS subject has received a very thorough treatment by P. A. Vestal (*Phil. J. Sci.*, 64, No. 3, November 1937) in connexion with the Hypericaceæ and Guttiferæ and allied families. The vascular characters that proved most significant were the dimensions of the vessels, the nature of their perforations and of the pittings upon their walls, the pitting and dimensions of fibre tracheids and the characters of the rays, particularly the uni-seriate rays. It is concluded that the groups studied fit very well with the taxonomic groups of Wettstein, the Parietales and Guttiferales, and that the anatomical evidence is more in favour of this author's treatment of these families or of their arrangement by Engler and Prantl than with their treatment by Hutchinson. The anatomical criteria found of value in this study agree very well with those of which the significance is underlined in a more general study of the same problem by L. Chalk (*Ann. Bot.*, N.S., 1, 409–428), but the latter author finds Hutchinson's arrangement of the Archichlamydeæ more in agreement with the evidence from anatomy than that of Engler.

Effects of Radiation on Polypore Fungi

THE results of a detailed investigation into the action of ultra-violet rays, X-rays, radium and sunlight upon three polypore fungi, formed the subject of the presidential address by Prof. S. R. Bose to the Botanical Society of India on January 6, 1938 (*J. Ind. Bot. Soc.*, 17, No. 1, 5; 1938). *Polyporus ostreiformis*, *Polystictus leoninus* and *Trametes cingulata* were the three species concerned, and the experiments were made with plate cultures upon malt extract agar. Ultra-violet rays and excessive direct sunlight diminished for a time the fertility of all three fungi, and in some cases even death ensued. Both hard and soft X-rays were studied; small doses

gave slight injury, from which the organisms recovered quickly, whilst heavy doses totally suppressed sporophore formation. Conidia and chlamydospores, however, remained almost unaffected. No effect of X-rays in promoting saltations, or mutations in culture, was observed. Treatment of the three poly-pores with large doses of radium damaged the vegetative hyphae and delayed the formation of fruit bodies, but subcultures recovered quickly. It is a notable fact that the three species mentioned will not fruit in darkness, so evidently they can tolerate, if not enjoy, the amounts of radiation present under natural conditions.

Action of Ammonia on Mercurous Chloride

ALTHOUGH the blackening resulting from the action of ammonia on mercurous chloride is now usually regarded as due to finely divided mercury, the nature of the other product has been the subject of discussion. H. R. Frecke and M. C. Sneed (*J. Amer. Chem. Soc.*, 60, 518; 1938) have shown that the course of the reaction is influenced by the concentration of aqueous ammonia (ammonium hydroxide) used, as well as by the time of reaction. The end-products with concentrated ammonia are a grey precipitate of the composition $(\text{Hg} + \text{NH}_2.\text{HgCl})$ and the water-soluble fusible compound $\text{HgCl}_2.2\text{NH}_3$. The latter on dilution partially decomposes into $\text{NH}_2.\text{HgCl}$ and ammonium chloride: $\text{HgCl}_2.2\text{NH}_3 \rightleftharpoons \text{NH}_2.\text{HgCl} + \text{NH}_4\text{Cl}$, so that the total reaction would be: $\text{Hg}_2\text{Cl}_2 + 2\text{NH}_4\text{OH} = \text{Hg} + \text{NH}_2.\text{HgCl} + \text{NH}_4\text{Cl} + 2\text{H}_2\text{O}$. In the case of dilute ammonium hydroxide, however, the speed of reaction is sufficiently slow to permit the identification of the intermediate products, namely, mercurous oxide (Hg_2O)—which does not amalgamate gold sheet—and ammonium chloride, which further react to produce metallic mercury and $\text{NH}_2.\text{HgCl}$: $\text{Hg}_2\text{O} + \text{NH}_4\text{Cl} = \text{NH}_2.\text{HgCl} + \text{Hg} + \text{H}_2\text{O}$. The authors consider that under ordinary conditions the reaction between mercurous chloride and ammonium hydroxide is best represented by the equation: $2\text{Hg}_2\text{Cl}_2 + 4\text{NH}_4\text{OH} = [\text{Hg} + \text{Hg}_2\text{O} + \text{NH}_2.\text{HgCl}] + 3\text{NH}_4\text{Cl} + 3\text{H}_2\text{O}$.

Theory of Liquids

IN a series of papers published in Indian journals between 1934 and 1936 a theory of liquids was developed by Dr. T. S. Wheeler, who obtained formulæ for many liquid properties, such as surface tension, viscosity and heat of evaporation, in terms of inter-atomic forces of the Lennard-Jones type. A collected account of this work has now been published (*Trans. Nat. Inst. Sci. India*, 1, 333; 1938). The theory is based on simple physical ideas and uses only elementary mathematics. A liquid is regarded as composed of a number of force centres, each of which vibrates within a spherical space kept free from other molecules by its thermal motion, and the translational motion is assumed to be small compared with the vibrational motion. A number of formulæ have been derived relating certain properties of a liquid with one another, and when the Lennard-Jones force constants are substituted in them they give numerical results in fair agreement with experimental values. The method employs a number of simplifying assumptions such that the molecules of a liquid are uniformly distributed round any one, that within the free spherical volume in which each molecule moves there is no field of force, and that the formulæ of the kinetic theory of gases may be applied. There

is no discussion of entropy or of free energy, on which alone calculations of vapour pressures can rigorously be based. None the less the paper gives a picture of a liquid which, while oversimplified, may help some workers on this subject to visualize liquid properties more easily.

Principles of Plant Design in Electrolysis

IN a paper on electrolysis discussed at a joint meeting of the Institutions of Electrical and Chemical Engineers on April 27, Dr. H. J. T. Ellingham concludes that although the principles on which the design and operation of plant for electrolysis depend are at least as simple and clear-cut as those for most other kinds of industrial process, their successful application requires close co-operation between the chemical engineer and the electrical engineer. This would ensure the co-ordination of the electrical and chemical factors in any particular problem in the most complete and appropriate manner. The paper sets out and correlates the relative electrochemical principles. Electrolytic processes may be carried out in order to obtain products such as metals, alkalis, oxygen and hydrogen, and various salts, which are to be marketed as such; but certain of these processes may also be worked as part of some other industry, as, for example, electroplating in the motor-car industry, alkali and chlorine in the manufacture of paper, and chlorates in the match industry. For many processes, electrolytic cells of various types have been patented, and units of standard size and output can be purchased from the respective manufacturers, for example, cells for the production of oxygen and hydrogen, or alkali and chlorine, and plant and chemicals for electroplating. Some electrolytic processes depend for their efficient operation on continuous working during day and night. These provide a very steady and continuous load for a power station. Many types of electrolytic operation are worked intermittently and a few, like oxygen and hydrogen, can be operated for irregular periods without much loss of efficiency. It would be advisable to arrange that these loads should be operated during 'off-peak' loads in conjunction with other intermittent electrical processes, so as to effect economies for both the chemical and electrical industries by securing a high load factor.

Spectroheliometer with a Vibrating Slit Mechanism

MR. F. J. SELLERS, director of the Solar Section, British Astronomical Association, has described his own construction of a spectroheliometer, involving certain departures from the standard type (*J. Brit. Astro. Assoc.*, 48, 6; April 1938). Mr. Sellers considered that oscillating slits would be more satisfactory than rotating prisms, and the spring-vibrating system is very simply operated by means of an electric contact-breaker, like an electric bell. The optical reversal occasioned by the collimating mirrors necessitates that the second slit should move in opposite phase to the first and remain parallel to it. A full description with a diagram is given of the various parts. Any amateur would be able to construct the various fittings required for the apparatus. It is interesting to notice that ordinary bell-battery dry cells operate the contact-breaker, and that these have been in use for eighteen months without serious signs of depreciation. Indeed, the whole apparatus has not given a moment's trouble since it was first tried in October 1936.