

RESEARCH ITEMS

Family Life of Rajputs

IN the foot-hills of the Himalayas north-east of Dehra Dun is the Doon district occupied by Rajputs who came from farther south in comparatively recent times. Dr. D. N. Majumdar (*Calcutta Review*, March 1939) has given an account of the family life of these people, who are tall and fair with long heads, leptorhine noses, hazel or blue eyes, curly hair and jovial disposition. They have maintained the purity of their Indo-Aryan descent although surrounded by the Mongoloid Gharwalis and other hill tribes. They build substantial timber houses of three or four stories against the severe winters and have small terraced farms with cattle and sheep. Like the Todas and Kotas and the Tibetans, they are polyandrous, several brothers having one or more wives in common under the same roof. The eldest born child is conventionally fathered upon the eldest brother, the next child on the second, and so on. In case of partition the eldest brother receives the largest share of the property. In a village investigated, the number of married males was four times that of the married females. The number of children is low, four or five brothers between them having only three or four children, and there is a preponderance of male children. The number of barren women is high, divorce of the wife is frequent and is followed by remarriage. A woman who has produced children fetches a much higher bride-price than one who has not. This fraternal polyandry they believe is derived from their Aryan ancestors, the Pandaras, but Dr. Majumdar gives reasons for thinking that it has been borrowed from other sources more recently. He also agrees with Westermarck that there are other causes of polyandry besides a paucity of women.

Morphological Characters of Bacteria and Viruses

IN his presidential address delivered to the Royal Microscopical Society last January, entitled "Towards the Smallest Living Things", J. E. Barnard contrasts the morphological similarities and differences that occur in micro-organisms of regularly decreasing size (*J. Roy. Micro. Soc.*, 59, 1; 1939). As the smaller objects are beyond the limit of visual microscopic resolution, the contrasts have been made by means of ultra-violet photomicrographs taken with a wavelength of 2750 Å., some by transmitted light, others by dark-ground illumination. From a study of these microscopical images, Mr. Barnard concludes that some at least of the filterable viruses are similar to some of the recognized bacteria. No viruses appear to be exactly similar to ordinary bacilli, but the resemblance of some viruses to cocci is much closer. Thus, ectromelia and vaccinia viruses are essentially coccoid in form. There is, however, a change with influenza and herpes viruses, which are types of virus growing in dense opaque masses, and the individual particles or units of which these are made up are very difficult to identify, as their size is very small, being less than 50 μ . It is therefore suggested that below some size, to which a precise value cannot yet be assigned, there is a change in constitution—not so much an alteration in form as a change

in behaviour. These animal viruses may at this stage bear a closer resemblance to the plant viruses, which recent work suggests are chemical in nature.

Mutant Body Colours in a Parasitic Wasp

ANNA R. WHITING has recently described her investigations into this subject and with reference to the species *Habrobracon juglandis* (*Proc. Amer. Phil. Soc.*, 80, No. 1; January 1939). It appears that wild-type individuals vary in colour from honey-yellow to almost black. This wide range of colour variation is confusing to the taxonomist, who is prone to lay much stress upon colour in diagnosing species. Temperature is of prime influence in connexion with coloration, the higher temperatures producing more yellow and the lower temperatures more black. Heredity also plays some part in the process, for the reason that some races may differ consistently in their coloration when subjected only to a constant temperature. In the type known as honey-yellow an exception is found to the rule that more black is deposited under low temperatures. The various facts are discussed in the light of Wright's theory of pigment formation in mammalian hair. It was found that this theory fits the facts observed in *Habrobracon* so well that, using it as a basis, the appearance of double and triple recessives was predicted with considerable accuracy before they were actually obtained. The various types referred to are well figured in the accompanying nine coloured plates.

Tobacco Necrosis Virus

N. W. Pirie, K. M. Smith, E. T. C. Spooner and W. D. McClement (*Parasitology*, 30, 543; 1939) isolated two nucleo-proteins with similar chemical composition from the leaves of tobacco plants infected with tobacco necrosis virus (*Nicotiana virus II*). One of them was crystalline and had a sedimentation constant of 130×10^{-13} , the other was amorphous and its principal component had a sedimentation constant of 58×10^{-13} . Each preparation infected plants at a dilution of 1 in 10^3 and precipitated specifically with serum at a dilution of 1 in 3.2×10^5 . The nature of the difference between preparations in the two states is obscure, and it has not been possible to convert one into the other.

Vacuolar Stain in Fungal Hyphae

S. R. BOSE, of the Carmichael Medical College, 1 Belgachia Road, Calcutta, has found a very faint pinkish stain in the vacuoles of very young hyphae not only of *Polypores* but also of diverse groups of fungi like *Mucor*, *Rhizopus*, yeast, *Penicillium*, *Ascoidea*, *Aspergillus*, *Fusarium*, *Cladosporium*, *Beauveria*, etc. (*Curr. Sci.*, 8, No. 4, April 1939). It does not agree with the tests of anthocyanin as found in higher plants. The nature of the pigment remains unknown. Evidently the stain has some connexion with the metabolic stage of the fungus, for it has been found only in actively growing hyphae and becoming scarce in very old hyphae and older cultures. Prof. Bose will be glad to have the experience of other workers on the point.

Chromosome Structure

R. RUGGLES GATES has published a valuable review of chromosome structure accompanied by a bibliography to recent work (*J. Roy. Micro. Soc.*, 58; 1938). There is considerable evidence that appearances which have previously been described as chromomeres may in many cases be an optical effect due to spiral coiling of chromonemata. Whether all cases of chromomeres will finally be interpreted in this way is doubtful. Direct observation also seems to show that the chromonemata are at least double in anaphase and telophase, quadruple in metaphase. The light thrown upon such problems by X-ray treatments are at variance and of doubtful reliability until more is known of the exact effects produced in this way. A relatively new line, possibly of considerable value in genetics and analysis of species, is the recognition of the universality of satellited chromosomes and their relation to nucleoli. The probable fact that a primary diploid usually has two SAT-chromosomes, opens possibilities of recognizing the presence of polyploidy by more than two nucleoli at telophase, the number of bivalents attached to the nucleolus at zygotene to diakinesis and the presence of secondary pairing.

Attachment for a Milne-Shaw Seismograph

AN ingenious and interesting addition to a Milne-Shaw seismograph has been fitted by J. H. Peters at the Observatory of the University of Hawaii in Honolulu (*Bull. Seis. Soc. Amer.*, 29, No. 2, 341-343; April 1939). The need for a strong motion instrument was particularly felt on the occasion of the Hawaiian earthquake of January 22, 1938, which disconnected the recording mirror, but as such instruments were not immediately available, additions to the existing equipment were made on the spot at very little cost. The instruments originally had $T = 12$ sec., $V = 150$ sec. and $\epsilon = 20 : 1$, recording photographic, and paper speed 15 mm./min. This was constituted for teleseismic work, which is the main need as strong local shocks are rare, but should local shocks occur the magnification was too great for photographic recording of high accelerations, and the paper speed too slow for recording the short periods. Recording mirrors have now been fixed to the top of a 2-inch long aluminium stem secured to the boom less than one half inch from the point of rotation and practically at the centre of the column. Lamps and auxiliary recorders have been placed at right angles to the boom line at a distance of about 23 inches from the mirrors to give a satisfactory magnification. The new recording works independently and in addition to the old recording which has been maintained, and the new would continue to function should the original be disconnected by a strong local shock. The new attachment is not constantly recording but is switched automatically into operation as soon as a local shock occurs which is strong enough to actuate the control. The new device should form a very valuable addition to the observatory's equipment.

Earthquakes registered during February 1939

ACCORDING to E. Peterschmitt (*Bull. Bur. central séismol. Strasbourg*) there were 174 earthquakes registered by seismographs throughout the world during February. The largest number in one day was fourteen on February 2, and there was only one day on which none was registered, namely, February

22. Some of these were recorded by only one station, several were registered by about six stations and nine were of such magnitude that it was possible to determine the epicentre, depth of focus and initial time accurately. These were: February 2, epicentre south-east of Tripoli, February 3, epicentre near Solomon Islands, February 5, Venezia Giulia and Dalmatia (Italy), February 6, a repetition of February 5. February 9, near Central America, February 11 near Mugello (Italy), February 16, north Japan, February 17, Struma Valley, south Bulgaria, and February 24, south Alaska.

Double Oxy-chlorides of Rhenium

WHEREAS very little is yet known concerning the chemistry of masurium (element 43 and Mendeleeff's eka-manganese) many compounds of rhenium (element 75, dwi-manganese) have been described. The latest are some oxy- and hydroxy-chlorides obtained by Jezowska and Iodko (*Roczniki Chemji*, 19, 187; 1939) by reduction of per-rhenic acid with hydrogen iodide. These investigators state that reduction proceeds to quadrivalent rhenium at room temperature without the presence of excess of hydrochloric acid. Among the compounds isolated are ammonium, potassium and rubidium salts having the general formula $X_2[Re(OH)Cl_5]$. These hydroxy-chlorides are easily converted into oxy-chlorides of composition corresponding with the formula $X_4[Re_2OCl_{10}]$, whilst with excess of concentrated hydrochloric acid and at elevated temperatures the normal rhenichlorides, X_2ReCl_6 , are formed. A quinoline oxy-chloride was prepared in addition to the alkali salts mentioned above. Since the same reactants can give rise to several different products, some difficulty was experienced in isolating these oxy- and hydroxy-salts in a pure state, a careful control of conditions being essential.

Fission of Rotating Bodies

LIEUT.-COL. K. E. EDGEWORTH has criticized (*Mon. Not. Roy. Astro. Soc.*, 99, 3; January 1939) some of Dr. R. A. Lyttleton's views (in particular those which appeared in *Mon. Not. Roy. Astro. Soc.*, 98, 8; 1938) regarding the fission of rotating bodies. Lyttleton believes that binaries did not originate by fission, as it seems probable that the smaller body would escape altogether from the larger, rotational energy being sufficient in certain conditions to drive the bodies apart from each other's influence. Edgeworth points out that such a process would involve repulsive forces for a time, such forces exceeding the force of gravity, but there is no known mechanism by which such forces could be produced. He discusses the theory that fission might lead to the production of a satellite and admits the possibility of a small portion of the detached material escaping the disintegrating effects of the Roche limit and so forming the nucleus of a satellite. The disintegrated material inside the Roche limit would gain angular momentum owing to the ellipsoidal shape of the larger mass, and for this reason would be driven outward and probably absorbed by the nucleus of the satellite, assuming that such a nucleus existed. Contrary to Lyttleton's view, Edgeworth thinks that the final stage to which a rotating body would attain would be two separate bodies revolving about each other in nearly circular orbits, but still subject to mutual interference in the form of tidal friction.