

Research Items

Dual Organisation in Assam. A study of social organisation in Assam by Mr. J. K. Bose (*J. Dept. Letters, Calcutta University, 25*) is based in part on a review of existing literature, in part on the results of field-work in the period 1931-34 among the Anals, the Aimols, the Lamgangs, the Mantaks, the Marrings and the Memis. It is thought that the dual organisation may throw light on the origin of the caste system. Among the Aimols, a very primitive tribe, there are two moieties, one superior and the other inferior, each having two phratries and each phratry two patrilineal clans; but the system is in process of disintegration owing to decreasing numbers and the scattered situation of the villages. Hence restriction in marriage is slackened; but in social and religious matters the dual organisation is strictly observed. Thus the social status of the superior moiety is recognised in all the important offices in the villages. The headman, assistant headman and priest all come from the superior moiety. The two moieties are also apart in the festivals they observe. The Anals, primitive hunter-agriculturists spread over sixteen villages in Manipur, have a typical dual organisation, while the Mantaks, a dwindling group, though in process of disintegration, retain a superior and an inferior moiety, but inferior officers are now drawn from the inferior moiety. The Lamgangs, a remote hill-people, show two moieties with only four clans each. Here there is evidence of the tendency to arrange the superior moiety in a hierarchy. Among the Marrings the dual organisation is of unique type, being based on territorial distribution. The Marring villages are grouped into a set of seven and a second set of five. This grouping has taken over the marital functions of the kinship groupings. It is clear that in Assam there are definite forms of dual or tripartite organisation of various types and in various stages of disintegration. Assam is, therefore, likely to prove as interesting for the study of early stages of society as Australia or Melanesia.

Reproduction in Nudibranchs. Mr. Leslie A. Chambers has made a valuable contribution to our knowledge of the methods of fertilisation and egg-laying in the Nudibranchiates (*Bull. Amer. Mus. Nat. Hist., 66, 1934*). The forms of the genital ducts are divided into four main types, and taking *Embletonia fuscata* as a typical nudibranch, the author describes the anatomy and histology of its reproductive system. There are three passages arising from the hermaphrodite duct—male, female and androgynous. A three-way valve effecting the selective separation of the spermatozoa from the ova is a feature hitherto undescribed, the author suggesting that it may have a possible general application to the hermaphrodite gastropods in which a separation occurs, that is to say, in most tectibranchs and all nudibranchs. There is also a mechanism for erecting the penis which seems to be peculiar to *Embletonia*. *Embletonia* was found in enormous numbers on the piles of a bridge near Beach Haven, N.J., all the individuals depositing spawn. In a few weeks they had all disappeared. This is typical of many nudibranchs, but as some species may be found breeding in the open sea as well as near the shore, it is suggested by the author that inshore spawning grounds are not essential, and that the large numbers of one

species sometimes found spawning inland are due to the chance displacement and survival of a few individuals, and their rapid development, no migration taking place. Anatomical evidence is given that each individual may pass through repeated reproductive cycles in the same season. With so many broods and with every individual of each brood depositing numbers of spawn masses, each single mass containing several hundred ova, there is considerable possibility of deriving the presumed migrations from a single individual cast on the shore by chance.

Calanus Production in Norway. Mr. Jacob D. Sømme has thoroughly investigated the biology of two species of *Calanus* (*finmarchicus* and *hyperboreus*) based on experimental studies and analyses of samples from the coast of Norway in various seasons (*Fiskeridirektoratets Skrifter. Serie Havundersøkelser, 4, 9; 1934*). Both species winter in the Lofoten area at great depths. *C. hyperboreus* particularly is restricted in winter to the inner parts which are very deep, *C. finmarchicus* being not so sharply defined in its distribution. In spring a vertical migration takes place, and later both species are carried away over the coastal banks in the surface currents. The spawning area of *C. hyperboreus* is very restricted and mainly dependent upon the extent of the winter area of distribution, the development of the later stages probably depending on low temperatures. *C. finmarchicus* has a much longer period of spawning and a much larger spawning area. Both species may be found together. Tables for the identification of all stages are given, and it is shown that the larvae of the two species are not distinguishable by morphological characters, but by measurement of the carapace rather than total length. Unfortunately, the paper by Dr. S. G. Gibbons on *Calanus finmarchicus* (Fisheries, Scotland, Sci. Invest., 1933. No. 1) was published too late for it to be used, as was also Dr. Nicholls's study of the life-history of *Euchaeta* (*Proc. Roy. Soc. Edinburgh, 1934*).

'Plaster Mould' Diseases of Mushroom Beds. A very useful article by Mr. W. M. Ware appears in the *Gardeners' Chronicle* of December 22 and 29, 1934. It describes two 'weed' fungi which are likely to grow on mushroom beds, to the detriment of the edible fungi. Both of the undesirable organisms are known as 'plaster moulds', since they produce a white, powdery covering similar to a dusting of plaster or lime. The white plaster mould (*Oospora fimicola* = *Monilia fimicola*) was known by English growers some time before it was recorded by the mycologist. It also occurs in France and the United States. Characters of the species are given in detail, and its occurrence described. It appears on beds just before they are ready for spawning, and also grows upon the covering of soil or 'casing', which is applied after the spawn has been added. Circumstantial evidence indicates that the fungus is introduced by the manure. The brown plaster mould (*Papulaspora byssina* or *Myriococcum præcox*) originally made its appearance in the United States in 1923, but has now appeared in Great Britain. This disease appears at the same time, and under similar conditions to the white plaster mould, but is not usually so harmful.

It first produces a white superficial mycelium, which quickly becomes cinnamon brown except at the edges. The brown part bears 'bulbils', or aggregations of hyphal cells, which seem to function as the sole reproductive bodies of the fungus. The brown plaster mould also seems to be introduced by the manure.

Traps of the Bladderworts. It is refreshing to find a genus of plants, the bladderworts (*Utricularia*), which scores so admirably off the animal kingdom. Prof. F. E. Lloyd (*Biol. Rev.*, 10, 1, 72; 1935) gives an extremely interesting account of the various kinds of traps—really modified leaves—and especially of the entrance mechanisms. The swiftness of the action is remarkable. By making use of motion photomicrography speeded up to 160 frames per second, the whole action falls within the sequence of five frames, the opening phase falling between two frames and the slower closing phase occupying the rest of the time. The entrance mechanisms of the traps are shown to be far more complicated and more delicate in their adjustments than has heretofore been thought, and are shown to be purely mechanical in action.

Clean-up of Gases by Getters. The process of removal of gas by the action of electropositive metals such as magnesium and barium is of great technical interest since it is much used in the evacuation of vacuum devices. A. L. Reimann (*Phil. Mag.*, Dec. 1934) has investigated the process for the 'getters' magnesium, calcium and barium and a number of common gases. Some clean-up occurs when the 'getter' is first volatilised on to the walls of the vacuum vessel (dispersal gettering); there is then some absorption of gas by contact action and the rate of removal is accelerated by maintaining an electric discharge in the gas. The 'dispersal gettering' may be treated as 'contact gettering' by a series of freshly formed getter surfaces. The contact gettering is more effective with barium than with magnesium or calcium, and is greatest when a black deposit of finely divided barium was formed by dispersal in the presence of gas. In most cases of contact gettering, the getter can take up much more gas than would cover its surface with a monomolecular layer—the gas seems to diffuse into the interior of the deposit. The gettering is usually favoured by a rise in temperature. The gas absorbed by a getter may be liberated again by heating, by displacement by another gas, or by impinging electrons or ions. In one of the experiments on a valve, if the anode potential was applied before the filament was heated, the getter acquired a positive potential and the vacuum deteriorated by electron bombardment of the getter. If the filament was heated and anode potential then gradually increased, the floating getter deposit acquired a different, lower, stable potential and the vacuum began to improve by clean-up. In electric discharge gettering, the getter removes particles such as positive ions and metastable molecules, and in some cases these form chemical compounds which are more stable than the products of simple contact gettering.

Oxygen Isotopes in Meteorites. An investigation on the relative abundance of the oxygen isotopes O^{16} and O^{18} in stony meteorites (S. H. Manian, H. C. Urey and W. Bleakney, *J. Amer. Chem. Soc.*, 56, 2601; 1934) by a method involving the conversion of the combined oxygen to water and then, by electrolysis, to oxygen gas, showed that the specific gravity of the water indicated, within an

experimental error of 29 per cent, in the ratio $O^{18} : O^{16}$, the same isotopic composition of the oxygen from three stony meteorites (Mocs, Knyahinya, Homestead) as from terrestrial granite and from potassium chlorate. Relative abundances of the isotopes in the oxygen gases were investigated by the vacuum mass-spectrograph and the same results were found, the experimental error in $O^{18} : O^{16}$ being reduced to ± 2.5 per cent. The value 514 ± 13.1 is submitted for the absolute abundance ratio $O^{18} : O^{16}$ for both terrestrial and meteoric oxygen. The agreement of this result with other mass-spectrographic determinations is compared, and the discrepancy with the band spectra value is pointed out. The average value of the mass-spectrographic determinations by the four different researches (omitting the results of Kallmann and Lasareff) is 517 ± 10 .

The Methylene Radical. By the thermal decomposition of diazomethane carried in a current of ether or butane below 500° , the free methylene radical, $:CH_2$, appears. It removes mirrors of tellurium, selenium, antimony and arsenic from the tube. In the case of tellurium, a red solid polymer of telluroformaldehyde, $(HCHTe)_n$, is produced, whereas free methyl forms a volatile red liquid, dimethyl ditelluride, $CH_3TeTeCH_3$. F. O. Rice and A. L. Glasebrook, who report these results (*J. Amer. Chem. Soc.*, 56, 2381; 1934), point out that they are not in agreement with current ideas on the nature of the methylene radical, most of which are based on Nef's premise that carbon compounds readily undergo a primary decomposition into a stable smaller molecule and a radical containing bivalent carbon, and some lines of evidence which would indicate that methylene should have a peculiar stability resembling that of a molecule rather than that of a free radical. At temperatures above 650° , it was found, but below the decomposition point of ether, only methyl groups were found; the methylene radical is apparently a highly reactive fragment of short life.

Meridian Observations of Faint Stars in Selected Areas. In the *Annalen van de Sterrewacht te Leiden*, 25, 4, Dr. C. H. Hins publishes a general catalogue of positions and proper motions of 1190 standard stars in areas 2-115 of Kapteyn's plan of selected areas. This work is the reduction to a uniform system, and combination, of the work of five observatories taking part in Kapteyn's plan, namely, Leyden, Berlin Babelsberg, Bonn, Paris and Strasbourg. The positions are in every case modern meridian circle observations of right ascension and declination, and proper motions have been found by comparison with old observations: but it is found that the modern precision so much exceeds the old that better proper motions would be obtained by repeating the observations in a few years time than by combining new with old observations. The author has reduced all the observations to the Leyden system as fundamental. (This system is in full agreement in R.A., and in very close agreement in Dec., with the P.G.C. system.) The magnitudes of the stars lie for the most part between 7.6^m and 9.8^m , the average magnitude being 8.5^m . The unit of weights is, on the average, $\pm 0.0275^s$ sec δ and $\pm 0.44''$ for R.A. and Dec. respectively, the weights attached to individual stars being for the most part from 2 to 10. Dr. Hins may be very heartily congratulated on the completion of this part of Kapteyn's plan of selected areas.