

Research Items.

SUMERIAN TABLETS.—The Manchester Museum has published copies of all of the "Behrens Collection" of Sumerian tablets excepting three, which are defaced and consequently useless. The complete collection contains 50 tablets from Drehem and Umma. The Drehem tablets, eight in number, tally in subject matter with the many others from this site which have been published, and deal with the daily business of Drehem. They contain records of animals for offerings. The Umma tablets belong to the same class, recording the daily details of the administration of animals, barley, and other products, wood, silver, and copper. As these tablets are contemporary, they afford a valuable source of information on Sumerian life and religion, while also serving to check the grammatical and religious texts composed later in Sumerian by authors who were not Sumerians, and when Sumerian had ceased to be the language of the people.

A EUROPEAN PARALLEL TO THE DURGĀPŪJA.—Dr. Sten Konow, in the *Journal and Proceedings of the Asiatic Society of Bengal*, N.S., vol. 21, No. 3, argues that although the goddess Kāli is now usually considered to be of non-Aryan origin, there are features in Kāli worship which may point to the existence of an old, not only Aryan, but also Indo-European goddess going back to the time when Indian and European tribes were one people. This view is based upon the account given by Tacitus in the "Germania," ch. xl., of the worship of Nerthus—Mother Earth—by certain German tribes. The features of this worship essential for the purpose of comparison are the position of the priest as the husband of the goddess, the procession and the ablution in a sacred lake. The ceremony may be concluded to be a fertility rite. Various attempts have been made to arrive at a derivation of the name Nerthus. It is rarely used, and Sahlgren has suggested that it is an epithet employed instead of the real name, which was taboo. If so, it should be explained by some feature in the festival, and it is suggested that it is connected with the Sanskrit *Nart*, *Nrt*, to dance, to act, *i.e.* a description of the symbolic or magic acting in the ceremony. The ideas connected with the base *nrt* are connected with Siva, the consort of Kāli, the latter, however, playing the more prominent part in the popular fertility rites, she being the great Earth Mother comparable to the chthonic deities and demons of fertility elsewhere. The features of the Durgāpūja in which Kāli is worshipped include days of preparation and feasting, a ceremonial procession, and lastly an immersion in water, which men may not see on penalty of death. The deity comprises the male and female element, thus in herself personating the divine couple represented by the priest and Nerthus in the European parallel.

THE RELATION OF GONAD AND PLUMAGE IN THE FOWL.—Messrs. Pézard, Sand, and Caridroit have demonstrated that in the case of the hen, if the amount of ovarian tissue is sufficiently reduced by operation, the female assumes the plumage characterisation of the male (*C. R. Soc. Biol.*, 92, 566 and 1034, 1924; 93, 1094, 1925; 94, 1074; *C. R. Acad. Sci.*, 177, 1087, 1924). F₁ hens out of a Brown Leghorn ♀ × Faverolle ♂ mating were used. The male plumage assumed was that of the Faverolle. The ovary regenerated, and associated with this increase in ovarian tissue the plumage again became as that of the female, first Brown Leghorn, later Faverolle.

The authors argue that these serial changes indicate that the Brown Leghorn type of plumage coloration is a response to a lesser ovarian stimulus than is that of the Faverolle. They conclude that there are racial differences in the threshold of response. Evidence that the conception of differential thresholds of response to gonadic stimulus applied even to individual feathers was also obtained. The occurrence of feathers male on one side of the rachis, female on the other, led the authors to the conclusion that each side of the feather is ambivalent and that it can assume the male or female characters alike, but that the two sides at any given moment during development may not respond similarly to the same stimulus.

HOMOLOGY OF THE ALA TEMPORALIS AND ALISPHENOID BONES.—Dr. Kesteven (*Jour. Anat.*, vol. 61, pt. 1, 1926) discusses at some length the homologies of these bones in the vertebrate series. With regard to the ala temporalis, he concludes that this bone in mammals has been derived from and is homologous with the pila pro-otica of the lower vertebrates. In this conclusion he is in opposition to the views of Broom, which are accepted by Watson, Gregory, and Noble, who regards this bone as a remnant of the palaeopterygoid cartilage. As to the alisphenoid bones, the author concludes that they are homologous throughout the whole craniate series. While accepting the views of Gregory and Noble that the so-called epipterygoids of the cynodont reptiles are homologous with the alisphenoid bones of mammals, he denies that they are homologous with the epipterygoids of other reptiles.

OCEANOGRAPHY OF THE BALTIC AND FISHERY RESEARCH.—The current quarterly number of the *Journal du Conseil permanent pour l'exploration de la mer* is mainly devoted to accounts of the water movements in the Baltic and its entrance into the North Sea. Prof. Otto Petterson discusses fluctuations occurring between one year and another in the inflow of the salter North Sea water, which passes in as a bottom current, carrying with it fish of considerable economic importance to the Baltic fisheries. Evidence of long-period fluctuations in the herring fishery is cited, and these are attributed to secular fluctuations in the tide-raising force. Dr. Palmen has applied Bjerknes' circulation theory to hydrographic observations made in the Gulf of Finland, and finds fair agreement between the currents calculated by this means and those observed. The determination of the age of cod from the number of 'winter rings' in its scales has presented difficulties owing to the formation of false rings during an unfavourable period in the life of the fish, such as may be brought about by temporary lack of food. Mr. Graham outlines a method which assists in distinguishing between such false and the true winter ring during the first year's growth, and hopes to extend the application of the method to older fish.

DEVONIAN VOLCANIC ROCKS OF NEW BRUNSWICK.—The *Bull. Geol. Soc. America* of Sept. 30 contains an interesting account by W. V. Howard of the Devonian rocks near Dalhousie, New Brunswick. The volcanic rocks include andesites, dacites, latites, and associated tuffs. Six excellent analyses reveal an unusual richness in soda for rocks of these types, and it may be significant, as the author points out, that some of the pre-Cambrian rocks of New Bruns-

wick and Maine share the same characteristic. Despite this, however, there is no evidence of consanguinity between the Dalhousie volcanics and those of the contemporaneous Aroostook series in Maine. Yet there is a striking resemblance, both mineralogically and chemically, between the rocks of the Dalhousie eruptions and those of the Pentland Hills and other Old Red Sandstone volcanic districts of Scotland. This resemblance extends even to the curious detail that on both sides of the Atlantic the volcanic series of this epoch are free from the great swarms of dykes which are usually found around ancient volcanic centres.

A NEW DESENSITISER FOR PHOTOGRAPHIC PLATES.—"Jute Red" (or Red 39,651) is a mixture of dyes which dissolves readily in lukewarm water to form a one per cent. reddish-orange solution. It is supplied by the Soc. Anon. des Matières colorantes de St. Denis, of Paris. M. René J. Garnotel claims (*British Journal of Photography*, Dec. 17) for it that it has many advantages over previously known desensitisers when applied to either negative or positive emulsions. If the skin or nails get stained by it the colour is entirely removed by a short wash with soap and water. Its aqueous solution (1 part in 5000) replaces some of the water of the developer formula without any risk of the precipitation of any constituent, and this is not only a simpler method of working than the use of a preliminary desensitising bath, but also does not interfere at all with the Watkins' factorial method of development. Formulæ are given for its use with M.Q. developers and for autochromes. The dye is completely eliminated in the ordinary course of washing in all cases.

MENTHONES AND DERIVED SUBSTANCES.—A noteworthy advance in the chemistry of the menthones and derived substances is recorded in the Sept. issue of the *Journal of the Chemical Society*. A short while ago Prof. John Read and Miss A. M. R. Cook were successful in isolating a number of pure derivatives of *dl*-isomenthone, starting from the eucalyptus ketone, *dl*-piperitone. They have now extended their operations to the preparation and characterisation of *dl*-menthylamine, *dl*-neomenthylamine and *dl*-isomenthylamine. In a further paper, by Prof. Read and Dr. G. J. Robertson, corresponding derivatives of the pure optically active forms of these bases are described, and a scheme is advanced for representing their relative molecular configurations. Certain striking similarities between the menthylamines and the *iso*-menthylamines are correlated with their closely similar molecular configurations, which differ only in the disposition of the groups about one of the three asymmetric carbon atoms concerned; a parallel relationship is anticipated between the *neo*-menthylamines and the as yet unknown *neo*-isomenthylamines. A new optically inactive menthol is also mentioned by Prof. Read and Miss Cook, and it is likely that additional information on the stereochemical relationships of this important group will be forthcoming as a further consequence of these interesting researches. Incidentally, a fuller knowledge of the chemistry of the terpene group as a whole should result; and it seems that Prof. Read and his assistants have opened up what may prove a very fruitful field of investigation.

POLARISATION OF LIGHT EMITTED BY POSITIVE RAYS.—E. Rupp (*Ann. der Phys.*, No. 22, p. 615, 1926) has recently examined the variation of the polarisation of the light, emitted by a beam of positive

rays of decreasing intensity, with the angle at which the beam of positive rays was observed. He dealt with positive rays of hydrogen, helium, and lithium, since these atoms possess the simplest electron structures. The results showed in general that the light polarised with its vector parallel to the beam of positive rays increased in intensity with the angle of vision. When observed in a direction at right angles to the beam, the intensity of the light polarised parallel to the beam was always greater than that of the light polarised at right angles thereto. The variation of the polarisation was greatest for hydrogen positive rays, and was more pronounced for higher velocities of the rays. In the case of helium and lithium rays the variation depended on the spectral series to which the emitted light belonged. Rupp considers that there is probably some connexion between the polarisation of the light emitted by a beam of positive rays of decreasing intensity and the polarised light produced by a beam of parallel electrons which has been studied by Kossel and by Skinner. In fact, the results could be expressed by saying that atoms, moving in a regular manner through an arbitrary arrangement of molecules or electrons, make impacts which result in the emission of polarised light.

OPTICAL CONSTANTS OF OPTICAL GLASS.—The catalogue of optical glass recently issued by the Parsons Optical Glass Company, of Little Chester, Derby, marks an important departure from tradition. The foundations of the usual method of specifying the optical constants of glass date from more than one hundred years ago, when Fraunhofer succeeded (about 1813) in measuring the refractive indices of his telescope glasses for some of the chief dark lines of the solar spectrum. Since that time it has been very usual to achromatise a lens such as a telescope object glass for visual observation by uniting the foci for the *C* and *F* lines. Photographic achromatism is usually secured by uniting *D* and *G*¹ (the latter being a line of the hydrogen spectrum). The choice of the wave-lengths for achromatism has, however, been periodically discussed, and has been criticised by Gifford and others. Certain conditions for visual achromatism used in optical designing by some workers, such as Conrady, have hitherto necessitated a certain amount of preliminary calculation for the refractive index for "the wave-length of brightest light" in the solar spectrum, approximately 0.555 $\mu\mu$, which must be done with the aid of a suitable interpolation formula. Furthermore, the refractive indices hitherto listed have not supplied sufficient indication of the variation of focus with wave-length when achromatism is so established that the minimum focus falls in the regions of shorter wave-length for photographic purposes. This catalogue, following the suggestions of Hasselkus, makes use of five lines in addition to the usual ones, two of helium at 706.5 $\mu\mu$ and 587.5 $\mu\mu$, and three of mercury at 546.1 $\mu\mu$, 435.9 $\mu\mu$, and 404.7 $\mu\mu$ respectively. The standard refractive indices are listed for the helium line, 587.5 $\mu\mu$, which is capable of more satisfactory performance on the refractometer than the double line of sodium. By the aid of this additional information the computer's task should be considerably facilitated, though the mercury green line at 546 $\mu\mu$ is decidedly on the short side of the maximum visual intensity, and a little experience will be needed to make the best use of the additional information. There is little need to direct attention to the wide and useful range of optical glasses now offered; the firm is prepared to make up intermediate types of glass to customers' requirements.