

## Research Items.

**ROCK-PAINTINGS IN THE LIBYAN DESERT.**—In *Antiquity* for September, Mr. D. Newbold describes a number of rock-paintings not previously seen by Europeans from various localities in the Libyan Desert. These were visited in the course of two expeditions in 1923 and 1927. Stone implements and pottery were also collected. The object of the expeditions was to examine archaeological evidence with the view of the elucidation of the ethnological history of the area, to which there are references going back so far as the eighteenth dynasty in the Egyptian monuments. The rock pictures are here classified into four groups: (a) Bushman—late palaeolithic or early neolithic; (b) Early Libyan—early neolithic, predynastic, and Old Empire; (c) Middle Libyan—Middle and Late Empire down to the introduction of the camel into the Sudan, that is, the early Meroitic period; and (d) Roman, medieval and modern. For (b) and (c) there are references to Libyans in the Egyptian monuments; for the latter half of (c) the evidence of Greek and Roman geographers and a few vague references in native 'Histories'; and for (d) the same authorities and Arabian geographers. In the areas visited, of which the pictures are here described, Owenat shows examples ranging from the earliest to the third period, Nukheila, Zolat el Hammad, and Um Tasawir examples from the second and third, while those at Qalaat el Wish and Abu Sofian are of the last modern period. The Kordofan pictures are difficult to date.

**AN EARLY DRAWING OF A FLORIDA CHIEF.**—In Volume 81, No. 4, of the *Smithsonian Miscellaneous Collections* is reproduced for the first time a drawing of an Indian 'King,' Satorioua, a Timucua chief in Florida in 1564. The drawing was executed by Jacques Lemoyne de Morgues, who accompanied Laudonnière to America in the reign of Charles IX. of France. Lemoyne was attached to the expedition as artist to map the coast and sketch the natives and their dwellings. Apparently his are the first drawings of Indians known to have been brought to Europe. They were reproduced by De Bry, who also published the artist's notes, purchased from his widow, in 1891. Among the published drawings is one of Satorioua in the act of performing a ceremony before he set out on an expedition against his enemies. The ceremony, of which two accounts are extant, consisted in part in scattering water towards his followers who sat round him in a circle, and then pouring the water on the embers of a fire so that his enemies might be quenched in like manner. The newly published drawing shows the chief at the moment when he has completed the ceremony with the bowl still in his hand. Lemoyne afterwards settled in England, possibly on account of being a Huguenot, and lived with Sir Walter Raleigh. It is possibly due to his influence that Raleigh's expedition to Virginia in 1585 carried an artist, whose instructions were very similar to those given to Lemoyne twenty years before.

**RESULTS OF OPERATIONS FOR CANCER OF THE BREAST.**—The Ministry of Health has recently issued another report on cancer, dealing with the late results of operation for cancer of the breast, based upon an analysis by Dr. Janet Lane-Clayton of 2006 cases occurring in the practice of general hospitals in eight county boroughs (*Reps. on Pub. Health and Med. Subjects*, No. 51). Arrangements were made for ascertaining the fate of all patients submitted to operation for breast cancer, assessed over periods of 3, 5, and 10 years after operation. The type of growth has

apparently little influence on the success or otherwise of operation. Early operation before the growth has spread beyond the confines of the breast is most important. When treated at this stage the percentage of survivals to 10 years is 73; when the disease has spread, the corresponding percentage falls to 13. Unfortunately, not more than 25 per cent of the hospital patients operated on are at this early stage. The nature of the operation performed is also very important, and the radical operation involving complete removal of the breast and underlying tissue with clearance of the axilla is generally to be preferred. Contrary to common belief, the prognosis was not worse in younger persons. The main lesson of this report is that a 'lump' in the breast of an adult woman calls for diagnosis and treatment without avoidable delay. If the lump be not cancerous, the anxieties of the patient are relieved; if it is cancerous, delay spells disaster, whereas treated by early operation the prospects are excellent.

**BIOLOGICAL STABILITY OF THE ARISTOCRACY.**—An investigation of the information contained in *Burke's Peerage* leads F. A. Woods to the conclusion that wealth and power do not lead, as is so often asserted, to idleness, sterility, and degeneracy. On the contrary, there are good reasons for considering aristocracy to be in many ways superior to the masses of mankind. Of 622 British peers in *Burke's Peerage* (1921), 334 are continuously aristocratic in the direct male line of their family trees to as early as the year 1450. Old families, then, do not become decrepit because of their old age, but in a general way families that once acquire high social position retain the high level. The author analyses the causes which contribute to this biological stability: ambition, capacity for advancement, family pride, marriage in the same social stratum, desire to leave heirs, and so on, any or all of which may be ingredients in the biological inheritance of the families concerned (*Jour. Heredity*, September 1928).

**FERTILE MARE MULES.**—A. H. Groth describes a very unusual case of fertility in a mule in the September issue of the *Journal of Heredity*. In 1920 a female mule, then twenty years of age, was reported to have given birth to a live female offspring sired by a jack. The two animals were acquired for observation by the Agriculture College of Texas. The colt developed into a dark bay mule showing no more characters of sire than an ordinary mule. The parent, "Old Beck," was mated unsuccessfully to a jack in 1921, but successfully to a bay saddle stallion in 1922, the result being a bay stallion colt in almost every respect like his sire. This animal has developed into a nicely balanced horse of saddle type, of remarkable intelligence, but showing a mule characteristic in his dislike to cross streams and ditches. He has been mated with several mares, one of which produced a bay stud foal. The original mare mule has, since the birth of her second foal, been mated on several occasions with jacks, but has had no further progeny, nor has success attended the mating of the older colt with stallions, jacks, or her half-brother. A second communication in the same journal records the birth of a "sure-enough" foal of a mare mule, sired by a jack, in Nebraska. The mare has been bred back to the same jack, and is believed to be again in foal.

**THE DISTRIBUTION OF BRITISH SHEEP.**—An analysis of the present-day distribution of breeds of sheep in the British Isles has led J. E. Nichols to some interesting conclusions regarding the climatic conditions best

fitted for each breed (*Jour. Textile Institute*, September 1928). It is assumed that in the case of sheep, as amongst wild animals, the distribution of each race or species is related to an optimum series of environmental conditions, so that there has come to be an association of definite types with definite environments, and the success of sheep-breeding involves the cultivation of the suitable type for particular local conditions. These conditions can be defined for British breeds of sheep. By considering together temperature and rainfall, it may be considered that the most suitable climatic environment for the Down breeds is a monthly rainfall of 2 inches or less from about February to June, with a mean temperature of not less than 37° F. for January and February; for the lowland long wools, the rainfall may rise to about 2½ inches with the same temperature conditions; while for the mountain and moorland types, the most suitable months for lambing are those during which the figures for rainfall and temperature most closely approach 3 inches and 40° F. respectively. It can also be said that generally the breeds which are most widely distributed in altitude are those which can withstand the greater number of rainy days.

SHALLOW-WATER ANTHOZOA OF HAWAII.—The late Prof. A. E. Verrill (1839–1926), of Yale, spent the last two years of his life in Hawaii and devoted much of his time to collecting on the reefs. His incomplete paper on the Hawaiian Anthozoa has been prepared for publication as *Bulletin 49* (1928) of the Bernice P. Bishop Museum, Honolulu, by Prof. C. H. Edmondson. Gorgonians and Alcyonacea appear to be almost lacking in shallow water and on the coral reefs of Hawaii, although both groups are abundantly represented around the Polynesian islands. A thin, encrusting, soft Alcyonacea, referred to a new genus *Sarcothelia*, and species of *Allogorgia* and *Euplexaura* of probable Hawaiian origin are described. Thirteen new species of Actinaria, three new Zoanthids, and two new Antipathes are also described. One of the Actinaria is *Sagartia pugnax*, which is carried about as a commensal in the chelæ of two species of small crabs—*Lybia* (*Melia*) *tesselata* and *Polydectus cupulifera*. Prof. Edmondson confirms Dr. Borradaile's statement that when the actinians are removed the crab immediately picks them up again, and he also states that when *Tealopsis nigrescens* (actinians of very different colour and appearance) were provided, the crab seized them and carried them about even when they were much too large. Prof. Verrill was apparently not aware that the anemone which he described as *Sagartia pugnax* had been referred by Prof. Duerden in 1903 to the genus *Bunodeopsis*.

MIOCENE MOLLUSCA FROM FLORIDA.—The monograph on "The Molluscan Fauna of the Alum Bluff Group of Florida," by Julia Gardiner, to which attention has already been directed (*NATURE*, Jan. 22, 1927), has now been completed by the publication of a fifth part (*U.S. Geol. Surv. ; Professional Paper*, 142 E). This contains the account of the Tellinacea, Solenacea, Mactracea, Myacea, and one Brachiopod (*Discinisca aldrichi*, n. sp.). The Alum Bluff group exhibited conditions of unstable temperature and marked an epoch exceptionally favourable to the recording of environmental changes in a shifting and developing molluscan fauna.

SOUTH AFRICAN CHITONS AND CHITON PHYLOGENY.—A series of South African chitons collected by Lieut.-Col. Turton have now been described by Mr. E. Ashby, who appends a list of the known forms

from that region (*Proc. Malac. Soc. Lond.*, vol. 18). Holding that the discovery of the fossil form *Protochiton* has largely removed difficulties that faced systematists when dealing with the classification of the group, the author considers that the phyla Acanthochitonida and Lepidopleurida were developed along parallel lines from the palæozoic stock in which the insertion plate is absent, and that it is therefore desirable that the Lepidopleurida should not be included under the suborder Eoplacophora but should form the most primitive family under the suborder Chitonina.

MUTANTS OF *ENOTHERA LAMARCKIANA*.—Around this plant, a classic in the study of mutation, a vast literature has arisen which may somewhat obscure the salient facts from all but the specialist student. Probably all students of genetics will therefore find useful a brief analysis of the different types of mutants in this plant, which is published by Hugo de Vries and R. R. Gates in the *Zeitschr. für induktive Abstammungs- und Vererbungslehre*, 47, 275–286, 1928. The account is illustrated by photographs of some of the main types, taken by Prof. Gates in the experimental garden at Lutteren. Seven primary mutants are described; all are trisomic, that is, they have the normal 14 chromosomes, 7 from each gamete, and then in each case they have one extra, but it is assumed that in each case it is a different one of the seven chromosomes that is thus doubled, and that this fact is closely connected with the different characters of the mutant. Three other trisomic mutants arising from *Æ. Lamarckiana* are known as accessory mutants because they arise more frequently (up to 9 per cent of the progeny) from certain primary mutants; on the other hand, these accessory mutants never give rise to the primary mutants. Then there are the well-known polyploid mutants, with multiple sets (21 or 28) of chromosomes. One of these, *semi-gigas*, gives rise to a number of secondary mutants. Whilst in the primary mutants the pollen is normal and the extra chromosome is carried only in a proportion of the ovules, in certain homozygotic mutants both pollen and ovules carry the same hereditary characters. Thus from unstable half-mutants of this type, by ordinary Mendelian segregation, 25 per cent of stable isogamic mutants are obtained and 25 per cent of empty seeds.

DISEASES OF THE RASPBERRY.—*Special Bulletin*, Number 178 of the Agricultural Experiment Station of the Michigan State College, issued June 1928, contains a useful survey, by C. W. Bennett, of the diseases of the raspberry. This plant is cultivated to a considerable extent in Michigan, where there are probably 10,000 acres under cultivation with this fruit, so that with a large number of varieties grown in close proximity, valuable experience must have been gained of most of the pests encountered during the cultivation of this fruit. Several varieties of virus disease are recorded. These have so far usually been grouped together under the term of 'yellows,' but Bennett distinguishes between 'curl,' 'mosaic,' and 'streak'; of these, 'mosaic' seems the most common. For all of them control seems restricted to 'roguing,' with prevention of aphid infestation. Typical crown-gall is described for raspberry, also a rust, an anthracnose, a wilt, powdery mildew, and a blight of the cane and another of the spur. A leaf-spot is described, but as usual is of little economic importance. Red varieties of raspberry seem to act as carriers of virus diseases which do them little harm, but produce serious damage when they spread to the black varieties. The symptoms of these various diseases are described, and the causal organism defined, except of course for the virus diseases. Probably the anatomy of the raspberry

shoot, in which a resistant endodermis forms along the internode at an early period and continues into the base of the leaf and the axillary bud (NATURE, vol. 119, p. 35, Jan. 1, 1927), explains why many of these diseases only do serious harm when attacking the young shoots of the current year's canes.

**EFFECTS OF MOISTURE CHANGES ON BUILDING MATERIALS.**—The Department of Scientific and Industrial Research has recently issued a *Building Research Bulletin* (No. 3) by R. E. Stradling on the effects of moisture changes on building materials. Disintegration of material may occur through water entering into chemical combination with certain constituents, such as lime formed during the firing of a brick or tile made from clay with a high chalk content. The effect of frost is also under investigation, but it is uncertain whether the freezing of wet stone in England is responsible for much damage. Considerable decay may be caused at the junction of two kinds of material by the solution of some constituent of one layer followed by its crystallisation in the other. Building materials frequently contain 'sorbed' water which is in a condition intermediate between the water of chemical combination and 'free' water, and the rôle played by such water is being carefully studied. The sorption of moisture causes an expansion of the material, which is followed by a contraction when the humidity of the air decreases. Considerable strains are thus set up and failures may occur, especially at the junction of materials having different moisture expansions.

**AN EASILY REGULATED SELENIUM RESISTANCE.**—A form of selenium resistance, showing behaviour analogous to that of the ordinary selenium cell, is described by Prof. Lavoro Amaduzzi in the *Rendiconti della Reale Accademia delle Scienze dell' Istituto di Bologna* for 1926 (recently received). It is prepared by incorporating graphite uniformly in the fused selenium, and spreading the mixture in a layer on a plane strip of stearite. Two parallel metallic wires, constituting the poles or electrodes of the cell, may be pressed lightly on to the layer, and if one of these be fixed, movement of the other in one direction or the other will increase or diminish the resistance of the cell.

**KRYPTON AND XENON.**—A process described by M. Georges Claude in the issue of *Comptes rendus* of the Paris Academy of Sciences for Oct. 8 seems likely to make krypton and xenon available in relatively large quantities. It appears that the great difficulty encountered hitherto in their preparation with ordinary liquid air plant has been that instead of remaining dissolved in the higher boiling parts of the liquefied oxygen, they were largely carried away mechanically in the spray formed in fractionation. M. Claude therefore proposes to feed the liquid oxygen into the top of a species of rectifying column, where the ascending vapour is washed thoroughly by descending liquid, with the result that the small quantity of liquid that ultimately reaches the bottom is now rich in the heavy components. This is drawn off, and its krypton and xenon content raised from one part in a thousand to two parts in a hundred, by removal of part of the oxygen by combustion with hydrogen; the residual gas is then absorbed on silica and fractionated, yielding almost half of the krypton and xenon that was present in the air originally taken into the liquefier. The feature of the new apparatus is that existing machinery is readily adapted to include it, and M. Claude estimates that a big installation, such as that at Boulogne, which uses 3000 cubic metres of air per hour, could produce several tens of litres of krypton

gas in a day's working, and about one-tenth this amount of xenon.

**LIGHTING AEROPLANE ROUTES.**—A summary of an American report on the applications of lighting for various novel purposes is given in the *Illuminating Engineer* for September and October. In the United States there are about 6000 miles of air routes which are provided with beacon lights not more than 10 miles apart, and illuminated intermediate landing fields 30 miles apart. The beacon lights are erected on steel towers about 70 feet high, at the bases of which are chrome yellow arrows 56 feet long which indicate the line of flight. For daytime identification the number of the beacon is painted in black on the arrow. The beacon develops a beam the intensity of which is about two million candle-power. Its axis is elevated about two degrees above the horizontal and it makes six revolutions per minute. The intermediate landing fields usually have two landing strips at right angles to one another, each of them being about 500 feet wide and 2000 feet long. The boundaries of the landing strips are marked out by white lamps; green lights mark the favourable approaches, and lamps in red globes are mounted on all neighbouring obstructions. Successful experiments have been made on controlling landing field floodlights by switches actuated either by the noise of the aeroplane or by a whistle of distinctive tone sounded from the aeroplane. Artificial lighting of areas devoted to recreational purposes is now extensively used, and it seems probable that baseball will soon be played at night time under artificial lighting. Under water lamps have been used for studying tropical marine life off the coast of Haiti. Both clear and coloured lamps were used, and the power of light to attract certain kinds of fish was demonstrated. In agriculture the attraction that light has for certain insect pests has been utilised in luring them to destruction.

**MOTIONS OF ELECTRONS IN GASES.**—There is a widespread feeling that the investigations of the motion of slow electrons in gases which have been made in the Electrical Laboratory at Oxford are incompatible with other experiments having a similar aim which have been performed elsewhere, and a recent statement to this effect has drawn the reply from Prof. J. S. Townsend which appears in pp. 511-523 of vol. 120 of the *Proceedings of the Royal Society*. There is no doubt that some of the adverse criticisms that have been levelled against his work would not have been made if his postulates and results had been more carefully examined. In other instances, the issue is less clear, but quite apart from controversial points, Prof. Townsend's contributions to the subject are unquestionably fundamentally important. To mention only two results, it has been established by him, or under his direction, that the collisions of slow electrons with molecules are almost perfectly elastic if no quantised transitions are excited in the interaction, and also that the mean free path of an electron depends upon its velocity of agitation. Again, as he points out, his work has been accepted as being of importance by the compilers of many of the standard text-books on the electrical properties of gases, particularly in its relation to sparking potentials; nor is there really any indication that the usefulness of his conceptions is exhausted, since in at least two recent instances, to which he does not refer, they have been applied with conspicuous success to fresh problems in gaseous conduction—by Dr. I. Langmuir and H. Mott-Smith to the action of a magnetic field upon the mercury arc, and by Prof. K. T. Compton and P. M. Morse to the theory of the so-called normal cathode fall of potential in a cold Geissler discharge.