

## Research Items.

**COLOUR SELECTION AMONG NEGROES IN THE UNITED STATES.**—An interesting investigation in sexual selection among negroes in the United States has been carried out by Mr. Melville J. Herskovits, who describes his results in vol. 12, No. 10, of the *Proceedings of the National Academy of Sciences of the United States*. It appears that a definite type of selection, based largely on skin colour, is practised by American negroes in many aspects of their life, but especially in marriage. Students who were being measured at Howard University were asked to state whether their mother or father was the lighter. In 30.3 per cent. of the cases the father was the lighter, in 13.2 per cent. the parents were about the same, and in 56.5 per cent. the mother was the lighter. Later 400 negro families were measured in the Harlem District of New York City. Of 176 married couples available for this investigation, 29.0 per cent. showed a lighter father, 14.5 per cent. the same colour in both parents, and 56.5 per cent. a lighter mother. Further analysis shows that the men who are party to the matings are darker than the females, though in unselected series of males and females there is practically no sex difference in colour. It would therefore appear beyond question that there is a social selection in operation through the tendency of males to marry lighter females. Selection on the basis of other negroid traits, thick lips or broad noses, does not appear to be operative. If this selection on the basis of skin colour continues, as the children of each generation will tend to be darker than the mother, the American negro population will become nearer the negro type, since the relative amount of negro blood will be increased, though there is too much Indian and white blood in it to permit reversion to the pure negro type.

**A VITRIFIED FORT AT DUNAGOIL, BUTESHIRE.**—Excavations carried out at a fort at Dunagoil, Bute-shire, from 1913 until 1915 and again in 1919, have yet to be described in detail; but a summary of the results has been published by Mr. L. M'Lellan Mann, in the *Transactions of the Buteshire Natural History Society* for 1925. The exploration of the fort is not quite complete. Vitrified forts are so called from the fact that the rubble core of the walling has been intentionally burned to form a hard vitrified mass to which the stones of the external walls adhere, thus giving great strength and power of resistance. Such structures are almost entirely lacking in fortified sites outside Scotland, where they occur chiefly near the seashore, ranging from the Solway up to the central west Highlands and thence in a belt across country to Inverness-shire as well as on a portion of the north-east coast. Dunagoil fort is entirely pre-Roman and was occupied from about 200 B.C. until A.D. 100. It is situated on a knife-edge ridge at the south end of the island of Bute. The construction of a crescentic wall on the less precipitous side, in order to give a fairly secure platform for the habitations of the occupiers, caused an accumulation of refuse which afforded a rich harvest for the excavators. The walls of the building were some twelve feet thick. They were built in stages of two or three feet, the rubble being burned at each stage until a height of fifteen feet had been reached. The rampart probably had two parapets and the fort two entrances, protected apparently by massive timber doors held by wooden bars which, when not in use, lay in horizontal holes in the interior of the walling. The objects found, which are very fully illustrated, included stone axes, hammers, knives, anvils, and other tools of stone, saddle querns

imperfectly converted into rotary querns, utensils and personal ornaments of imported soapstone and lignite, an inferior hand-made pottery, many objects of bone and antler including a peculiar pin or bodkin, square in section with ornamented sides; bracelets of jet, lignite, and glass, the last-named multicoloured, and a large variety of iron objects.

**MARINE BIOLOGY AT THE ISLE OF MAN.**—The report of the Biological Station at Port Erin, Isle of Man (fortieth annual report of the former Liverpool Marine Biology Committee, now the Oceanography Department of the University of Liverpool), drawn up by Prof. J. Johnstone, indicates satisfactory progress in all directions. The fish cultural work carried out for the Manx Government shows a good average yield of young plaice, and the lobster hatching still improves, the numbers being considerably higher than before. More than a million plaice larvæ and more than six hundred lobsterlings, besides a large number of younger stages, were liberated into the sea. In the Bio-Chemical Laboratory Mr. J. R. Bruce has completed his investigations into the seasonal variations of the gaseous metabolism of the common mussel (*Mytilus edulis*), and the results have been published in the *Biochemical Journal*. He also continues his interesting researches on the metabolism of shore-living dinoflagellates. In the appendix, Mr. A. Scott describes the plankton of the spawning ponds and its seasonal variation. Mr. H. C. Chadwick, in his "Natural History Notes," mentions the occurrence of the diatom *Rhizosolenia robusta*. This is interesting, as the usual northerly limit of this species is the English Channel. It is to be noted, however, that in the last two years this diatom has been particularly abundant in the autumn at Plymouth. Being such a large form it should be of more than usual importance for feeders on the phytoplankton. A list of publications based on work done at the Laboratory shows a number of important papers dealing with fishery problems, physiology, and natural history, and includes Prof. Johnstone's book, "A Study of the Oceans." In the introduction to the report it is stated that the Laboratory is little used by visitors in the late summer, and a glance at the list of research workers shows this very plainly. It is curious that there is not more eagerness to undertake studies in these important months.

**THE FLORA OF THE TALYSH.**—Under the above title Mr. A. A. Grossheim, botanist of the Tiflis Botanical Gardens, has recently published an interesting volume (273 pp., 16 plates, map; text in Russian, summaries in English and in Turkish) dealing with the vegetation and flora of the little-known country at the south-western corner of the Caspian Sea. The author gives vivid and detailed descriptions of various types of vegetation, ranging from that of marshes (which harbour the endemic water nut *Trapa hyrcana* G. Wor.) to the deserts, and from lowlands forests of *Parrotia persica* and *Zelkova carpinifolia* to the rocky, woodless, semi-desert formations of higher mountains. An analysis of the flora enables the author to arrive at some interesting conclusions as regards the history of the vegetation of the region in question. In Tertiary times the country was covered with forests of tropical character, and genera like *Albizzia*, *Gleditchia*, etc., have survived even until the present day. Later on, with the advent of a drier period and the development of a powerful centre of xerothermic flora in Persia, that flora (Hyrcanian) began to invade Talysh from the south, while about the same time an invasion began

of the Mediterranean flora from the west. Further intensification of the dry and hot conditions resulted in the appearance of numerous endemic xerothermic forms, which are clearly younger than the actual autochthonous elements. The glacial period, which brought great changes to the flora and vegetation of other parts of the Caucasus, left no traces whatever in the flora of Talysh. Later influences were of little importance, and only the activity of man was responsible for the introduction with the culture of rice of a fair number of typically tropical lowland plants, which misled previous students of the flora to conclude that it is essentially sub-tropical in character, whereas it is not so. A formal division of the country into botanico-geographical districts concludes the memoir.

FIELD TRIALS WITH COTTON.—M. A. Bailey and T. Trought, in Technical and Scientific Service Bulletin No. 63, report on experiments conducted by the staff of the botanical section of the Egyptian Ministry of Agriculture, under the ægis of the Cotton Research Board, to determine the amount of variability that might be expected in field trials with cotton, and the technique which would best reduce the experimental error. For comparative trials, it is recommended that no paths should be left between the beds, but that adjacent ridges should be uprooted at picking time. Variety beds are best repeated ten times, while all trials should be extended over a period of at least three years. The most suitable form for the beds is that of long, narrow strips, situated along the lengths of the ridges to facilitate sowing, the area being one-fifth feddan where possible (1 feddan = 4200 sq. m. or 1.038 acres approximately). The results should be computed by the method of differences. The procedure to be followed in the event of insufficient land or seed is also dealt with. A special feature of the report is the inclusion of various frequency curves, charts, and tables, which allow of a more exhaustive analysis of the data by other workers if desired.

JUNIPER IN NORWAY.—The half-yearly issue (Oct. 1926) of the *Transactions of the Royal Scottish Arboricultural Society* opens with an interesting article on "The Nordfjord of Norway," a long arm of the sea extending 60 miles eastwards from the North Sea, with several subsidiary fjords. The author, Mr. F. R. S. Balfour, treats of both the agricultural and forestry aspects of the country, showing the interdependence of the population on the two pursuits. An interesting item in this article deals with the use of the juniper, which grows into a small tree of 30 feet high, for fencing work. Fences are almost exclusively made of this wood, which lasts as long in the ground as the North American *Juniperus virginiana*. The author saw a fence erected one hundred years ago, and still perfectly serviceable.

COAL IN SOUTH AUSTRALIA.—The Mining Review of the South Australian Department of Mines for the half-year ending June 30, 1926, recently issued, contains an interesting summary of what is known regarding the coal and lignite resources of South Australia. Apparently the only true bituminous coal so far discovered lies at very considerable depths covered with highly water-bearing Tertiary sediments, which appear to render its economic exploitation impracticable. There are three occurrences known of sub-bituminous coal, apparently of Triassic age; this coal appears to be only of moderately good quality, the moisture as mined ranging from nearly 9 per cent. to more than 30 per cent., and the ash from more than 6 per cent. to more than 18 per cent.;

a sample which has been tested gave 7460 B.Th.U. per lb. as mined, a figure which compares very unfavourably with ordinary bituminous coal. A number of occurrences of Tertiary lignite are known; apparently the only attempt at actual mining has been done in the Moorlands field, and the coal has been extensively tested, but the results do not appear to have been satisfactory. It would appear that up to the present, imported coal can be used to better economic advantage than any of the mineral fuels hitherto discovered in South Australia.

GRANITE DOMES OF VREDEFORT AND ARRAN.—The recent monograph on the Vredefort Mountain Land, by Hall and Molengraaff, has aroused world-wide interest among geologists, mainly because of the wonderful and almost incredible structure of the sediments on the flanks of the granitic dome which lies in the heart of the region. The sediments have not only been heaved up but they have also been carried through the vertical and overturned. For this reason, Hall and Molengraaff rejected the idea that the structure might be due to the upward surge of magma. Their problem is further complicated by the possibility that the Vredefort granite is, in the main, older than the overtilted sediments; and their tentative conclusion is that the balance of evidence favours the conception of centripetal pressure as the cause of the dome. In the *Geological Magazine* for November, Mr. E. B. Bailey summarises the evidence, and points out in detail the striking analogies presented by the granite dome of North Arran. Although in Arran the surrounding schists are rarely overturned, the evidence is conclusive that they were powerfully uplifted by the intrusion of the granite complex, and that the upheaval was accompanied by an outward movement that succeeded in overturning a boundary of Old Red Sandstone. Mr. Bailey points out that an upward magmatic push must develop an outward centrifugal push. Combining this tectonic necessity with the evidence of its existence elsewhere, and the difficulty of imagining a mechanism to explain the suggested centripetal pressure, he strongly advocates central upheaval by upward magmatic pressure accompanied by centrifugal pressure as the explanation of the updoming and back-tilting of the formations bordering the Vredefort granite.

PHYSIOGRAPHY OF THE VIRGIN ISLANDS.—The New York Academy of Sciences has nearly completed the publication of its detailed "Scientific Survey of Porto Rico and the Virgin Islands." One of the most recent parts to appear is vol. 4, pt. 1, which deals mainly with the physiography of the northern Virgin Islands, British and American, by Messrs. H. A. Meyerhoff and J. F. Kemp. The conclusions of most interest are those with regard to the submarine platform from which the islands arise. This has generally been accepted as due to marine erosion in Pleistocene times, when the sea-level was lowered in tropical latitudes, but Mr. Meyerhoff is convinced, after a detailed study of its features, that river action has played the chief part in its formation. He found numerous remnants of horizontal coastal plain deposits, presumably of Tertiary age, lying on the submerged platform. These are evidence of river erosion before Pleistocene time. The action of the waves in Pleistocene times was effectual, if at all, only in modifying the surface. The evidence is discussed at length in the monograph, which is well illustrated with maps, diagrams, and photographs.

RAINFALL OF MORAVIA.—Some relation between the amount of precipitation and altitude above sea-

level are discussed by Dr. Fr. Rikovsky in Part 78 of *Publications de la Faculté des Sciences de l'Université Masaryk*. On the plateau of Moravia the rainfall is 530 mm. at 200 m. and increases some thirty-three millimetres for every 50 metres up to 650 m., above which the increase grows rapidly. In the eastern or drier part of the Moravian Carpathians the fall is 561 mm. at 200 m., and the increase up to 600 m. is much more rapid than on the plateau, while at higher elevations it is much slower. The explanation is that on the Carpathians the air currents, owing to the steep slope, are forced to rise abruptly, and so lose much of their humidity at low altitudes, while on the plateau the rise is gradual and the loss of moisture steady. In the western part of the Moravian Carpathians, precipitation is much greater and increase is steady and continuous. Statistical tables and diagrams show these relationships.

**RESISTANCE OF METALS AT LOW TEMPERATURES.**—Supplement No. 58 to the Communications from the Physical Laboratory of the University of Leyden consists of a collection of all the known data concerning the electrical resistance of metals at temperatures below  $-80^{\circ}\text{C}$ . made by the late Prof. Kamerlingh Onnes and Dr. W. Tuyn. A large proportion of the data comes from the Leyden Laboratory, but in all cases references are given to the original sources. 42 pages of tables and curves are devoted to the influence of temperature, 4 to that of pressure, and 28 to those of impurities, heat treatment, and other factors. Of the large number of formulæ which have been suggested for the relation between the resistivity and the temperature only a few are noted. For mono-atomic metals the resistivity seems to be proportional to the product of the absolute temperature and the atomic heat at constant pressure. There is some divergence of opinion as to the validity of a law of 'corresponding resistances' which has been suggested.

**IMPACT TESTS OF STEEL AT LOW TEMPERATURES.**—Impact tests have been made by Ryonosuke Yamada (*Sci. Rep.*, Tohoku Imp. Univ., Ser. 1, vol. 15, No. 5, Nov. 1926) on a large number of steels at temperatures from that of the room down to that of liquid air. The main results obtained are: In general the impact value falls as the temperature is lowered, though in a dead-mild steel, for example, this value actually rises down to about  $-40^{\circ}\text{C}$ ., when it suddenly falls to almost zero. Quenched and tempered steels, or any steels with a sorbitic structure, are much tougher at low temperatures than are pearlitic steels. The addition of nickel and chromium retards appreciably the increase of brittleness as the temperature is reduced. As the latter falls there is a progressive tendency for the fracture produced to pass around, instead of through, the crystals, and the fracture in pearlite to take place in all directions irrespective of the orientation of the lamellæ.

**A NEW PHENOMENON IN THE ABNORMAL DISCHARGE.**—When the distance between the electrodes is decreased in a tube in which a normal discharge is passing, the potential difference between the electrodes gradually decreases, until the anode approaches so close to the cathode inside the Faraday dark space that some of the fast primary electrons from the cathode reach the anode, and then the potential falls somewhat rapidly. If the distance between the electrodes is still further decreased, the potential remains practically constant until the anode penetrates approximately to the middle of the negative glow, when it increases very rapidly, owing to the fact that the fast primary electrons and the secondary electrons they produce have not sufficient

space in which to form considerable numbers of positive ions. In investigating this phenomena during the passage of an abnormal discharge, Guntherschulze (*Zeit. für Phys.*, 40, 414, 1926) found that the higher the applied potential, the sharper did it fall just before the rapid increase due to the close proximity of the electrodes occurred. The cause of this phenomenon is found to be that the fast primary electrons from the cathode are able to form larger numbers of positive ions in the layer of gas and water vapour absorbed on the surface of the anode than they are able to produce in the body of the gas in the tube.

**ISOLATION OF ELEMENT 61.**—In their first paper on the isolation of element 61 (see NATURE, Dec. 4, 1926, p. 820, and Jan. 1, 1927, p. 27), Rolla and Fernandes stated that a sealed packet containing their results and a photograph of the X-ray absorption spectrum was sent to the Royal Academy of the Lincei so early as June 1924. In order to prove their claims to be the first to isolate the element, these preliminary results have been published in the November issue of the *Gazzetta Chimica Italiana*. Rolla and Fernandes have proposed the name 'florentium,' with symbol 'Fr,' for this element in honour of the University of Florence, where the research was carried out.

**THE ATTEMPTED CHANGE OF MERCURY INTO GOLD.**—The News Edition of *Industrial and Engineering Chemistry*, dated Dec. 10, contains a detailed account by Sheldon and Estey, of the New York University, of attempts to change mercury into gold by the method used by Miethe. The actual type of mercury are lamp used by Miethe, which was obtained from Germany, as well as other lamps, were used, and the experimental conditions were reproduced so far as possible. Details of several experiments are given, but in no case was any amount of gold greater than 0.005 milligrams (the limit of detectability) produced. Various deposits were produced in the lamps, but these never contained any gold, and the residual mercury was also found to be free from that metal.

**IGNITION TEMPERATURES OF SOLID FUELS.**—In connexion with the subject of spontaneous combustion, the study of the ignition temperatures of fuels is of great importance. K. Nakamura and A. Shimomura have improved the ordinary form of apparatus, and have published the relative ignition temperatures of twenty-two kinds of solid fuels, including lignites, bituminous as well as anthracite coals of oriental origin, semi-coke, metallurgical coke, and wood charcoal, in the *Memoirs of the Kyoto College of Science*, Series A, Nov. 1926. Previous work by Wheeler has been confirmed, and it has been found that volatile matter and ash-content have a decided influence on the ignition temperatures of the fuels.

**MECHANISM OF KOLBE'S ELECTROSYNTHESIS.**—There are two theories as to the exact nature of the change by which ethane is produced at the anode during the electrolysis of a solution of potassium acetate. According to the 'oxidation theory,' the discharged anions react with water to give the acid which is oxidised by atomic oxygen to give the synthetic product, while the 'discharged ion' theory supposes that two discharged ions unite directly. A paper in the *Journal of the Chemical Society* for Dec. 1926, by D. A. Fairweather and O. J. Walker, describes some work on solutions of acetates and propionates which was carried out in order to obtain further data bearing on electrosynthesis. The results show that the synthesis can only be accounted for on the 'discharged ion' theory.