

Research Items

The Katanga Skull

THIS human skull belonging to a skeleton found in 1918 in some old native workings in the mine of Kambove (Katanga) in the Belgian Congo, has been made the subject of a study by Dr. Matthew Young of University College, London (*Mém. Musée Roy. d'Hist. Nat. de Belgique*, (2), 5). The skull is complete, with the lower jaw. It is undoubtedly of negro type, though showing signs which suggest admixture. Unfortunately, the remainder of the skeleton was not preserved. Although stained green with malachite, it shows no signs of mineralization to any appreciable degree. The specimen is of moderate length, very narrow, with a notable post-orbital constriction, and relatively high with a well-arched vault. The forehead is fairly rounded and shows the median eminence characteristic of the negroid type, though there are distinct indications of frontal eminences. The supraciliary ridges are fairly prominent. The temporal ridges are strongly developed, which is said to be a negroid feature. They appear to be more convergent than usual. The face is long, the nasal bridge excessively flat. The nasal aperture is relatively wide. Prognathism is moderate, and the lower jaw robust. The lower central incisors had been extracted at an early age. The skull is adult and probably male. It most closely resembles the Teita series from East Africa collected by Dr. Leakey, except in regard to the length of the face and especially of the alveolar portion. In this respect, it resembles two Nuba females from South Kordofan. A similar type of unusually long face and development of the alveolar region, accompanying an exceptionally high palate, is seen in Leakey's Nakuru and Elmenteita types, which have been compared with the Oldoway skull. These are usually considered to be Hamites, while Keith regards Oldoway as proto-Hamite. The Katanga skull then is a negro of recent date, probably not later than twelfth century, and is more nearly allied to the East than the West African type. It may be the remains of a slave captured at some distance from the Katanga.

Mule Deer of the Pacific Region of America

As a result of the examination of 602 specimens of *Odocoileus*, supplemented by the studies of former investigators, Ian M'Taggart Cowan finds that two species only inhabit the Pacific coastal region of North America—the white-tailed deer (*O. virginianus*) with two geographical races, and the black-tailed deer (*O. hemionus*) with nine. Complete intergradation was found between the latter and *O. columbianus*, formerly regarded as a distinct species (*California Fish and Game*, 22, 155; 1936). The monograph is a thorough one, but we can refer here only to two points of general interest. The pigmentation, particularly of the tail, shows great variation, and each colour grade is generally associated with a more or less uniform set of environmental conditions, but over the whole area the intensity of the coat colour seems to be related to the humidity of the environment. The races living in the humid coastal region have the darkest pigmentation, the desert forms the

lightest; and in these respects the coloration agrees with what has been found in several other mammals and birds. The second point is that the races of the mule deer conform to the general truth known as Bergmann's law, that individuals of races inhabiting colder localities are larger than those of races inhabiting the warmer regions. Not only is this so, but also the northern races, as well as being larger than the southern, display greater sexual dimorphism in size of body.

Pinus radiata in New Zealand

A LEAFLET (No. 28. N.Z. State Forest Service, December 1936) has been recently issued dealing with the terminal hypertrophy in *Pinus radiata* in relation to frost damage. It is based on researches by Mr. T. T. C. Birch. Hypertrophied terminals are distinguishable from a normal leading shoot by the following characteristics: (1) length of terminal, from last whorl to apex, exceeds 4 ft. and occasionally reaches 12 ft. or more; (2) epicormic shoots and five-needle fascicles are often associated with the condition; (3) the larger hypertrophied terminals do not necessarily represent one year's growth, two layers of wood frequently occurring in the basal portions, without lateral branches; (4) abnormal turgidity and brittleness, primarily due to the large proportion of medulla in the shoots. As might be expected, hypertrophied terminals rarely escape some form of climatic injury, and owing to their brittle nature, many of those projecting above the normal crown-level of a stand, are broken or damaged by wind. Frost also is responsible, both directly and indirectly, for a considerable amount of damage to hypertrophied terminals. Mr. A. D. McGavock, director of forestry, says in a note that "Mr. Birch is conservative when he describes this leader as 'occasionally reaching 12 ft. or more'. This is correctly stated if he refers to a single year's growth only; but similar growth in subsequent years is frequently superimposed on this, and lengths of up to 22 ft. without a single lateral branch have been measured. Such a condition in itself is undoubtedly a sign of ill-health in a tree; but seemingly because it is not due to any pathogen nor to any apparent mechanical injury, it has not, so far as I am aware, received any attention from forest pathologists".

Respiration in Tropical Fruits

THE extensive studies of changes during ripening in fruits in storage under English conditions carried on at the Low Temperature Research Station, Cambridge, are now being very usefully extended to the tropical fruits, at the equivalent research station in Trinidad. Drs. C. W. Wardlaw and E. R. Leonard have two papers dealing particularly with respiration in tropical fruits in the *Annals of Botany*, 50, 1936, which are also issued separately by the Imperial College of Tropical Agriculture (July 1936). Two points of general importance in these communications are the further support given to the importance of the oxygen concentration in the internal gas concentration in relation to the initiation of that period of maturation frequently described as the climacteric,

and the new suggestion that the subsequent onset of senescence may be associated with the difficulty in the movement of oxygen into the interior of the fruit as a result of the changes in texture, etc., associated with maturity, which hinder the ready access of oxygen from the outside air. Considerable attention has been paid to the internal atmosphere in these studies, such hollow fleshy fruits as the papaw readily lending themselves to the necessary technique for sampling the internal gases.

A Halo-Spot of Tomatoes

THE prevalence of tomatoes covered with a number of silvery spots has been noticed on many occasions. Insects were thought to be the cause, but Dr. C. L. Walton has shown (*Gard. Chron.*, Jan. 2, 1937) that this is not so. The trouble appears when 'top-watering' to simulate rain is practised. Drops of water fall upon the fruit, and if a burst of sunshine occurs, they evaporate very rapidly, and the skin of the fruit is scorched. This kind of trouble is probably more widespread than is often realized, and the lens-shape of the drops may even cause necrotic spots or other puzzling symptoms.

Cordierite in Pegmatites from Japan

THE results of an important study of cordierite and its graphic intergrowth with quartz in Japanese pegmatites has been published by H. Shibata (*Jap. J. Geol. Geog.*, 205; 1936). The pegmatites are regarded, not as of purely igneous origin, but as syntectic products involving reaction with the invaded rocks. One from Sasago injects sandstone and slate; in the central zone of graphic microcline-granite, rosettes of andalusite and intergrowths of cordierite and quartz occur. Another intrudes amphibolite of the Misaka Series (Higashidani). Soda diffused into the amphibolite, while reaction between magnesium silicate (from hornblende) and the pegmatitic liquid led to the crystallization of cordierite. In another example (Mujinazawa) cordierite also formed by reaction of magmatic material with hornblende. A zonal arrangement of minerals developed, with graphic intergrowths of cordierite and quartz in the intermediate zone. The analysed cordierites show large amounts of iron, manganese and soda. The author has systematized the physical and chemical properties of cordierites from all parts of the world. The various relationships between optical properties and chemical composition are summarized in a series of tables and diagrams.

Geographical Distribution of Deep-Focus Earthquakes

A RECENT paper by Messrs. B. Gutenberg and C. F. Richter (*Bull. Seis. Soc. America*, 26, 341; 1936) contains some interesting notes on the distribution of deep-focus earthquakes. Those with focal depths of about 100 km. occasionally occur in nearly all the seismic regions of the globe. Others with depths of about 200 km. are frequently found in regions, such as the eastern Mediterranean and the Hindu Kush, where there is at present no evidence of very deep foci. So far as is at present known, earthquakes originating at the greater depths (400-800 km.) are confined to a few regions adjoining the Pacific Ocean, such as Kamchatka and the Kurile Islands, Japan, the East Indies and western South America. In Japan and South America, the deeper the foci, the farther removed as a rule are the epicentres from

the ocean basin. With regard to the origin of such earthquakes, the most probable conclusion at present is that normal and deep-focus earthquakes are caused by the same forces, which may act near the surface or at great depths.

Measurement of Upper Winds

THE measurement of upper winds by means of pilot balloons is the subject of a recent publication (M.O. 396) of the Meteorological Office, Air Ministry (H.M. Stationery Office, 1936. 1s.) This method of measuring upper winds has been in use for many years, and has developed greatly as the demands of aviation for information about upper winds have increased. It depends upon observations of the elevation and azimuth of a small balloon that ascends at a nearly constant speed and is carried horizontally by the wind at its level. These angles may be measured by a single theodolite, and the wind is then calculated on the supposition that the rate of ascent is strictly constant. Alternatively, two theodolites may be used at a known distance apart, or a tail of known length may be attached beneath the balloon and the angle subtended by the tail be measured by a graticule at the focus of a single theodolite. Each of these alternatives does away with the need for assuming a constant rate of ascent, and in expert hands provides reasonably accurate information about the upper winds. In M.O. 396 the practical details are set out, including the method of filling the balloon and giving the necessary free lift, the setting up of the special theodolite and the working out of the speed and direction of the wind from the observed angles. A full-sized drawing of the special slide rule used for these computations is included.

Air Conditioning in Modern Buildings

IN a paper read on February 19 by Mr. E. R. Dolby to the Institution of Mechanical Engineers the whole question of ventilation and air conditioning in modern buildings is discussed. It has been stated that the ideal condition of the air is that of a hillside on a bright spring morning. This is taken to mean that the air is free from dust, odours, etc., that the temperature should be moderate, say, 60° F., the humidity about 50 and that there should be a bright atmosphere with slight, but not excessive, movement. In the ideal suggested, the carbon dioxide in the air should be restricted to not more than 6-7 parts in 10,000, as compared with 4 parts in 10,000 in the external air. Mere ventilation as, for example, the system used in coal mines, where a large volume of external air is passed into the mine and the contaminated air in the mine extracted, differs from 'conditioned air' ventilation as now used in houses, shops, factories, theatres and ballrooms. In the latter case the vitiated air is evacuated and replaced by air so treated that dust, fog, deleterious gases and odours are eliminated. The temperature of the incoming air is raised or lowered and its humidity is suitably modified. At the same time the conditioned air must cause no unpleasant draughts. The maximum air velocity of the delivered air, for comfort, in sedentary occupations is assumed to be about 2 ft. per sec. In large works, hotels, exhibition buildings in which a kitchen or canteen forms part of the establishment, the installation of a separate ventilating and air conditioning plant is well worth considering.