

## Societies and Academies.

## EDINBURGH.

**Royal Meteorological Society, July 24.**—Dr. C. Chree, president, in the chair.—C. K. M. Douglas: Observations of upper cloud drift as an aid to research and to weather forecasting. The condition of the wind near the top of the troposphere in different stages of a cyclone is discussed. The pressure distributions aloft, disclosed by the upper winds, are considered in relation to temperature, as the pressure at considerable heights is largely determined by the temperature of the column of air underneath. There is complete lack of symmetry in the temperature distribution over a cyclone in its earlier stage, with a great contrast in the temperature of the whole troposphere between the "polar" and "equatorial" currents. When the cyclone becomes stationary and fills up, the distribution of temperature and wind in the upper air approaches to symmetry round the centre, and the easterly current on the north side often extends throughout the troposphere. No simple rules for weather forecasting can be drawn up, as the changes in the wind at considerable heights follow rather than precede those near the surface, but observations of high cloud motion are valuable, for they indicate the temperature distribution in the troposphere.—J. S. Dines: Note on the effect of a coast line on precipitation. A convergence effect occurs over a coast line when the wind blows along the coast, the low pressure being over the sea and the high pressure over the land; this may cause precipitation. Under favourable conditions an upward current of 15 feet per minute may be produced over a strip of the earth's surface extending 5 miles on each side of the coast line. A similar effect occurs wherever the pressure gradient varies along a line perpendicular to the isobars, and the following rule is deduced: "In any area where the pressure gradient increases towards the 'High' there will be rising air."—A. E. M. Geddes and C. A. Clarke: Note on turbulence, as exhibited by anemometer records, smoke and cloud formation. The effect of eddy motion is shown near the surface by the records from a pressure tube anemometer. The turbulence and consequent eddy motion depend largely on the nature of the surface over which the air current is travelling. Eddies higher up are shown by smoke from tall chimneys. Higher up, cloud of the stratus order is formed. Smoke eddies and clouds occur when there is little or no convection due to heated air, and therefore their appearance and formation is evidently in accordance with Taylor's theory of eddy motion. Eddies occur at the junction of two currents of different temperature, and fragments of cloud form below the base of the line squall or similar cloud. Cloud intermediate between the normal cirrus and cirro-cumulus types undergoes changes which are at present unexplained. The change of the cirro-cumulus type, regarded as a water-droplet cloud, into the ice-crystal structure of true cirrus is only to be expected at high altitudes and consequently generally very low temperatures, but the reverse process occurs frequently.

## PARIS.

**Academy of Sciences, July 10.**—M. Emile Bertin in the chair.—Paul Janet: The standard reproduction of the international ohm. An account of the preparation of eight standard mercury ohms by the late M.

René Benoît. The differences between the values measured by electrical methods and the values deduced from the geometrical dimensions did not amount to more than a few hundred-thousandths. The mean of the absolute values of the deviations was  $1.9 \times 10^{-5}$ .—E. Cartan: A fundamental theorem of H. Weyl in the theory of metric space.—A. Châtelet: Finite Abelian groups.—J. Guillaume: Observations of the sun made at the Observatory of Lyons during the first quarter of 1922. Observations were possible on 74 days during the quarter; the results are summarised in three tables showing number and area of spots, their distribution in latitude and the distribution of the faculae in latitude.—G. Sagnac: The oscillations of the spectral lines of double stars explained by the new law of projection of energy of light.—E. M. Lémeray: General relativity and the Milky Way.—R. Jouast: Comparisons of the standard reproductions of the international ohms. The standards constructed by the late M. René Benoît were compared by Kelvin's double-bridge method. Of the ten originally constructed one was rejected owing to an accident in mounting, and another had also to be rejected on account of an apparent discontinuity in the tube. Details of the measurements are given. The values range between 0.99984 ohm and 1.00015 ohm.—Vasilescu Karper: A particular class of batteries. A voltaic cell is formed by a mixture of amyl alcohol and water containing zinc sulphate in solution. This separates into two phases, the upper being amyl alcohol, the lower an aqueous solution of zinc sulphate. With zinc electrodes this cell gives an E.M.F. of 0.7 volt. The results obtained with this and similar cells are not in accord with Nernst's osmotic theory of cells, and appear to contradict the second law of thermo-dynamics.—P. Janet: Remarks on the preceding communication. It is necessary to prove rigorously that the cycle formed by the substances present constitutes a closed cycle.—Albert Granger: Observations on the baking of ceramic products in electrically heated furnaces. With platinum-wound furnaces the highest temperature attainable with safety is about 1300° C. For higher temperatures a granulated carbon resistance is necessary. A grey tint on the porcelain made in this furnace was proved to be due to the action of carbon monoxide passing through the wall of the tube (corundum mixed with a refractory clay).—R. Locquin and Sung Wouseng: Aldehydes obtained starting with tertiary alcohols.—F. Boiry: Vulcanising rubber in solution. A study of the interaction of indiarubber in colloidal solution and sulphur with different solvents at high temperatures (over 120° C.). With phenetol as solvent the compound produced contained 31.5 per cent. of sulphur, approximately corresponding to  $C_{10}H_{16}S_2$  (32 per cent. sulphur), which may be considered as the ultimate product of vulcanisation.—Hervé de Pommereau: The reduction of ethyl  $\alpha$ -naphthylacetate and of the  $\alpha$ -naphthyl-ethanols by sodium and absolute alcohol.—Emile André: Contribution to the study of grape seed oil. Study of the solid fatty acids. Method of separating stearic and palmitic acids.—A. Duffour: A new example of hemihedral forms not conforming to the sign of optical activity.—Gabriel Bertrand and Mokragatz: The presence of cobalt and nickel in arable soil. The method of extracting these metals from the soil and identifying them is given in detail. A specimen of garden soil (Pasteur Institute) has given 0.0037 gm. cobalt and 0.0174 gm. nickel per kilogram of soil.—I. Athanasiu: Nervous motive energy. Electroneurograms.—A. Desgrez, H. Bierry, and F. Rathery: The state of acidosis. Method of proof and treatment.



## CAPE TOWN.

**Royal Society of South Africa, June 21.**—Dr. C. F. Juritz in the chair.—S. H. Haughton: On some upper Beaufort Therapsida. A new genus of Cynodont reptile, *Cynidiognathus*, for the species *C. longiceps* based on a skull from the Burghersdorp Beds is described. Its dental formula is  $14c1m10$ . There are well-marked palatine processes of the premaxillæ, no prevomers, and the epipterygoid is retracted from the quadrate. A skull thought to be *Cynognathus berryi* is assigned to the new genus under the name of *C. broomi*. The palate and basicranium of *Ælurosuchus* is discussed; the genus belongs to the Bauriamorpha.—T. J. Mackie: Observations on the protective action of normal serum in experimental infection with *Bacillus diphtheriæ*. In guinea-pigs experimentally infected with *B. diphtheriæ*, normal serum from various animals, injected subcutaneously at the same time as the inoculation, exerts a definite protective action. No protection occurs if the serum injection is delayed for 2 hours after the inoculation—the effect is prophylactic, not curative. The activity of the serum persists at 57° C., but is lost at 70° C. and higher. Serum from one guinea-pig injected subcutaneously into another is fully protective or exerts a delaying effect; it is noteworthy that serum of an individual of species highly susceptible to experimental *B. diphtheriæ* infection should be capable of affording some protection when injected parenterally into another animal of the same species infected with the particular organism. Normal horse serum is also protective in guinea-pigs injected with diphtheria toxin.—W. A. Jolly: Note on the electrogram of the frog's gastrocnemius reflexly excited. Records of the electrical change in the gastrocnemius when contraction is elicited reflexly by mechanical stimulation of the heteronymous foot, show that the response of the muscle is of the nature of a tetanus.—J. S. van der Lingen: Note on a cystoscopic irradiator and an ultra-violet light illuminator. The illuminator consists of a lens-system, of two quartz lenses and an iris diaphragm, whereby a field may be illuminated with any desired group of ultra-violet waves. One irradiator takes the form of a quartz-rod or tube shaped like a cystoscope, and the illuminator, by which rays are passed into the organs to be illuminated. The rays pass out only at the spherical tip. The other form consists of an exhausted tube bent into the form of a cystoscope, with a bulb at the external end containing a small quantity of mercury. Carbon-monoxide is introduced into the tube by heating, and this causes the mercury to radiate at a low temperature, when a high-frequency field oscillates in a helix placed over the external end of the tube.

## SYDNEY.

**Linnean Society of New South Wales, May 31.**—Mr. G. A. Waterhouse, president, in the chair.—G. D. Osborne: The geology and petrography of the Clarencetown-Paterson district. Pt. 1. The descriptions are based upon an exhaustive survey of about 200 sq. miles containing rocks of the Burindi Series, Kuttung Series and the Cainozoic System. It is suggested that the Kuttung Series be divided into a basal stage, a volcanic stage, and a glacial stage in consequence of modifications found in the general sequence, the most important of which is the discovery of glacially-produced rocks on a much lower stratigraphic level than hitherto recognised. Five detailed sections of the volcanic stage are described. The work confirms

the broad stratigraphical succession as given by C. A. Sussmilch.—G. F. Hill: Descriptions and biology of some North Australian termites. Four new species and two hitherto undescribed castes of the genera *Eutermes* and *Hamitermes* are described.—J. B. Cleland: A second bird census.—A census of the numbers of species and individuals observed on a series of journeys in various districts. The districts covered are southern coastal Queensland, Blue Mts., N.S.W., South Western Plains, N.S.W., Adelaide and Renmark Districts, S.A., and the Central Northern District, S.A.

**Royal Society of New South Wales, June 7.**—Mr. C. A. Sussmilch, president, in the chair.—A. R. Penfold: The isolation and identification of the acid bodies produced by the oxidation of piperitone by means of potassium permanganate. The ketone used was from *Eucalyptus dives*, and three acids were identified.—M. Henry: The incidence of anthrax in stock in Australia. Introduced originally about eighty years ago, anthrax attained serious proportions in certain districts, but during the last thirty years there has been a decline in the area infected. The disease has always been definitely localised. It was introduced near Sydney and carried inland and into Victoria but then disappeared from its original areas. At present most of the coastal districts, the tablelands and the Western Division of New South Wales are anthrax free. The real anthrax country consists of a belt in the western slopes; in Victoria there is a similar belt. Queensland is free, and possibly was never affected, and in the rest of Australia the disease is negligible. The season of greatest danger from anthrax is the summer and early autumn. The mortality from it is not heavy. There is an inhibitive factor which has prevented anthrax becoming more widespread. Among human agencies the controlling factors have been vaccination, quarantine, destruction of carcasses by fire, breaking up of large estates, and substitution of agricultural for pastoral activities. Contaminated soil is generally the source of infection; infected feeding-stuffs, the common source of infection in England, do not operate.—E. Cheel: (1) Notes on the species of *Darwinia Homoranthus*, and *Rylstonea* in the states of New South Wales, Victoria, South Australia and Queensland. The plants are known as "Fringe Myrtles" or "Scent Myrtles," and are said to be of importance on account of the essential oil contained in the leaves. The plants known as *Darwinia taxifolia* are very variable and great care is necessary in the selection of material if pure grades of oil are required. Plants originally collected at Rylstone and given the name *Rylstonea* are probably forms of *Verticordia darwinoides*. (2) Notes on *Melaleuca linariifolia* and *Melaleuca trichostachya*. These species are commonly known as "Tea Tree" and "Tee-doo" respectively, and are also said to be of importance on account of the essential oil contained in the leaves

## Official Publications Received.

Imperial Department of Agriculture for the West Indies. Report on the Agricultural Department, St. Kitts-Nevis, 1920-1921. Pp. iv+33. (Barbados.) 6d.

Department of Agriculture, Trinidad and Tobago. Administration Report of the Director of Agriculture for the year 1921. Pp. 12. (Port-of-Spain, Trinidad.) 6d.

On the State of the Public Health: Annual Report of the Chief Medical Officer of the Ministry of Health for the year 1921. Pp. 115. (London: H.M. Stationery Office.) 1s. 6d. net.