

MODELS OF METEOROLOGICAL CONDITIONS IN THE FREE AIR.

THE photographs of which Figs. 1 and 2 are reproductions are views of two glass models constructed at the Meteorological Office to represent the temperatures and pressures in a block of atmosphere fifteen miles thick over a triangular portion of the British Isles on July 27 and 29, 1908.

Records of pressure and temperature were obtained by means of balloons carrying small meteorographs, designed by Mr. W. H. Dines, F.R.S. Corresponding values of pressure, temperature, and height were computed from the records.

Balloons were liberated at Ditcham Park, Petersfield; Pyrton Hill, Oxfordshire; Glossop, Derbyshire; Crinan, Argyllshire; and Birdhill, Co. Limerick. The courses of the balloons were in some cases traced for part of the way by means of theodolite observations.

The purpose of the models is to give a representation of the information thus obtained, and to exhibit the meteorological variations in three dimensions. Each model consists of a rectangular base, upon which is drawn an outline map of a portion of the British Isles on the scale of 25 miles to an inch, together with isobars and winds for 6 p.m. on one or other of the two days. Upon the base are erected vertical glass plates, secured at the top by a horizontal plate. In Fig. 1 (July 27) the vertical edges of the prismatic shell thus formed, from left to right, stand over the above-named stations in order, Birdhill being the corner shown at the back. In Fig. 2 (July 29) Ditcham is represented only by a standard bearing arrows to show wind direction. The recording instrument sent up from that station on that day has not been found.

Distances measured vertically along the glass sides of the models represent heights above sea-level on the scale of 5 miles to 4 inches. The vertical scale of the model is therefore twenty times the horizontal scale of the map. The total height represented is 24 kilometres (15 miles).

The observations from each station are plotted on the edges of the models. Isotherms (full lines) are drawn on

the glass sides for every 5° C., the temperature being expressed in absolute measure. The space between the isotherms of 270° and 275° is filled in to indicate the position of the freezing point.

Both models show clearly the two main divisions of the

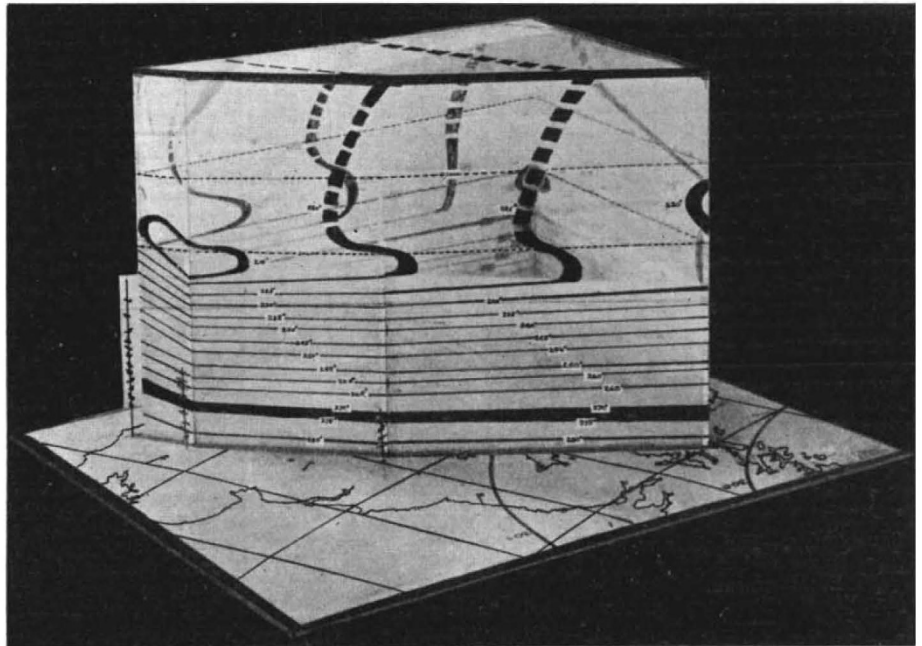


FIG. 1.—From observations taken on July 27, 1908. Block seen from the north-east. Isotherms are shown for each 5° Absolute from 280° A. to 215° A. The space between the isotherms of 270° and 275° is filled in; for other isotherms a thickness corresponding with ½° C. is covered. The beaded lines in the stratosphere are isobars for 0.2 megabar and 0.1 megabar respectively. The arrows on the standards face the wind as determined by observations with theodolites.

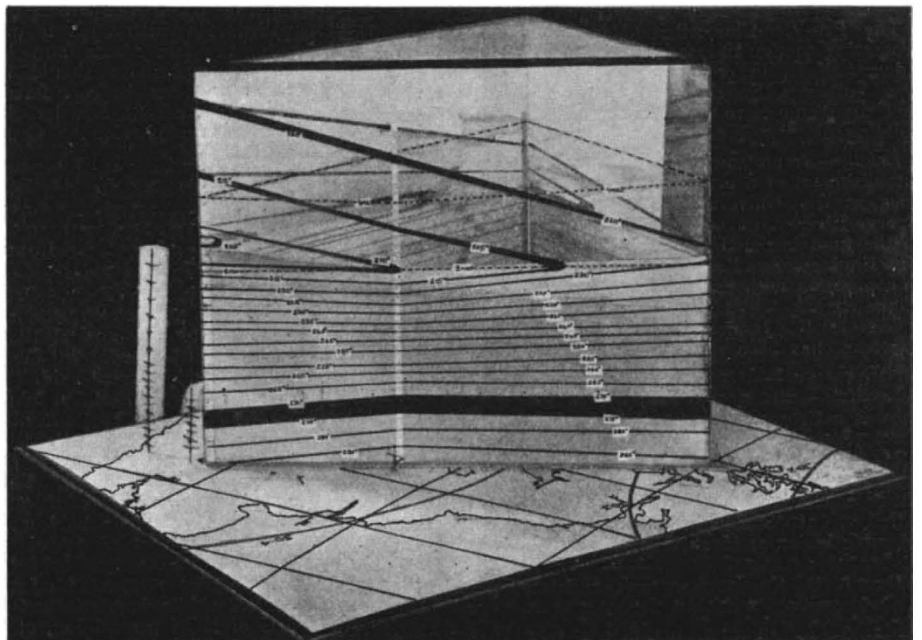


FIG. 2.—From observations taken on July 29, 1908. Block seen from the north-east. Isotherms are shown for each 5° Absolute from 285° A. to 205° A. The space between the isotherms of 270° and 275° is filled in; for other isotherms a thickness corresponding with ½° C. is covered. The beaded lines in the stratosphere are isobars for 0.2 megabar and 0.1 megabar respectively. The arrows on the standards face the wind as determined by observations with theodolites.

atmosphere, viz. :—(1) "troposphere," or lower portion, in which temperature diminishes with height at a nearly uniform rate and the isothermal surfaces are approximately horizontal, and (2) "isothermal region," or

"stratosphere," above the troposphere, in which temperature is nearly constant or increases slowly with height, and the isothermal planes tend to become vertical.

Isobars for one-tenth and one-fifth of an atmosphere (0.1 megabar and 0.2 megabar according to the nomenclature of the Paris Conference of Physicists, 1900) are shown by beaded lines in the upper parts of the figures.

Wind-direction observations are indicated by arrows facing the wind, carried on standards.

The chief points of difference between the two models are the following:—

	FIG. 1.	FIG. 2.
(1) Surface temperature ...	From 28° to 28.5°	From 28.5° to 29°
(2) Sea-level pressure... ..	From 1.016 to 1.023 megabar (30.0 to 30.2 in.)	From 1.026 to 1.033 megabar (30.3 to 30.5 in.)
(3) Height of lower surface of stratosphere	9 km.	10 km.
(4) Lowest temperature in stratosphere	About 215°	About 205°
(5) Wind direction at south-east angle	Nearly S. throughout	Nearly N. throughout

Both figures show that the position of the coldest air was at a height of 10–11 kilometres over the most southern portion represented.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

BIRMINGHAM.—The chair of accounting vacated by Prof. Sidney Dawson has been filled by the election of Mr. Charles E. Martineau.

Mr. W. B. Grove has been appointed honorary curator of the fungus herbarium in the Botanical Department.

Prof. R. Saundby has been appointed to represent the University on the General Medical Council for a further period of five years.

Prof. Bostock Hill is to represent the University at the Conference on School Hygiene to be held in Paris in August.

The Pro-Vice-Chancellor (Alderman F. C. Clayton) is presenting to the University a statue of His Majesty King Edward VII., in commemoration of the opening of the new buildings by the late Sovereign. It is understood that the statue is to stand in the entrance hall of the main building.

LEEDS.—Arrangements have now been completed for the establishment of a professorship of coal gas and fuel industries at the University as a memorial to the late Sir George Livesey, upwards of 10,500l. having been subscribed to the fund initiated for the purpose by the Institution of Gas Engineers, and an advisory committee has been formed in connection with the work to be carried out by the holder of the chair.

Dr. J. K. Jamieson, hitherto chief demonstrator of anatomy, has been appointed professor of anatomy in the University.

LONDON.—Sir Henry Roscoe has resigned his membership as a Crown nominee, and Mr. F. D. Acland has been appointed in his place.

Mr. F. L. Golla has been appointed honorary demonstrator of chemical pathology and pharmacology in the physiological laboratory of the University, and Mr. A. D. Mitchell, of Sheffield University, has been appointed scientific assistant in chemistry in the University.

DR. J. D. COALES has been appointed principal of the Wolverhampton Technical School.

MR. J. A. JENKINS, for fifteen years registrar of the University College of South Wales, Cardiff, has resigned that position.

On July 8, the honorary degree of Doctor of Laws of the University of Edinburgh was conferred upon Prof. John Chiene, emeritus professor of surgery in the University; Prof. Matthew Hay, professor of forensic medicine, University of Aberdeen; and Prof. W. H. Perkin, F.R.S., professor of organic chemistry, University of Manchester.

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THE increasing popularity of holiday courses for teachers is an excellent indication of the growing desire of schoolmasters and schoolmistresses to acquaint themselves with improved methods of instruction, and to bring their knowledge up to date by attending during their holidays lectures by experts. The County Council of the West Riding of Yorkshire has arranged a series of vacation courses for teachers, to be held at the Municipal Secondary School, Scarborough, during August next. Among the items in a very attractive programme, we notice a course of ten lectures by Prof. A. Smithells, F.R.S., on solution, and the physics and chemistry of cleansing processes; twelve lectures on the teaching of general elementary science, by Mr. W. Mayhowe Heller; and eight lectures on nature-study, by Mr. O. H. Latter. Laboratory work and excursions have been arranged in connection with these courses. There will also be a course in educational handwork, organised by the Educational Handwork Association, during July and August at the same place, and it is possible for students to take a joint West Riding and handwork course.

ON December 21, 1909, the London County Council decided to make a maintenance grant of 8000l. to the Imperial College of Science and Technology, South Kensington. In return for this grant it secures the privilege of nominating twenty-five students for one year's free instruction at the Imperial College. These are now to be nominated for the first time. The instruction will be of an advanced nature, and therefore only advanced students who are qualified to enter on the fourth year of the course should apply. There is no restriction as to income, but intending candidates must be ordinarily resident in the Administrative County of London, and must be students at an institution aided, maintained, or approved by the council. The free studentships do not entitle the holders to any maintenance grants, but cover all ordinary tuition fees. No examination will be adopted for the final selection of the students from the applications received. The free studentships will be awarded on consideration of the past records of the candidates, the recommendations of their teachers, the course of study they intend to follow, and generally upon their fitness for advanced study in science applied to industry. It is quite possible that, in special cases, the free places may be extended to two or more years. Application should be made without delay, as entries will not be considered after July 23. Application forms (T. 2/268) can be obtained from the Education Officer, London County Council, Victoria Embankment, London, W.C.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 30.—Sir Archibald Geikie, K.C.B., president, in the chair.—Prof. A. D. Waller: A new method for the quantitative estimation of hydrocyanic acid in vegetable and animal tissues. The method is colorimetric, and depends on the reaction between potassium cyanide and picric acid, first studied by Hlasiwetz (*Liebig's Annalen*, cx., p. 289 [1859]), and recently applied by Guignard to the detection of minute quantities of hydrocyanic acid (*Annales Sci. Pharmacol.*, 1906, p. 415) and by H. E. Armstrong to the rapid detection of emulsin (Proceedings, March 10). The colour-scale is prepared by mixing equal volumes of a recently titrated solution of 1/10000 hydrocyanic acid and of picrate mixture (equal volumes of 0.5/100 picric acid and 5/100 sodium carbonate). From this stock solution (T 50), after twenty-four hours in an incubator at 40°, a colour-scale is prepared by further dilution with picrate mixture, to contain, e.g., 1, 2, 3, &c., parts of HCN per million, of tints T 1, T 2, T 3, &c. The estimation is made by matching the colour of the given fluid or of its distillate into picrate mixture (after suitable dilution if required), with that of the colour-scale. Thus, e.g., if the tint of a distillate from 10 c.c. of blood (dil. × 5) into 25 c.c. of picrate is found = T 5, and the volume of picrate + distillate is 40 c.c., the amount of HCN in the distillate = 5 × 40 millionths gram, i.e. 0.000200. A second distillation shows whether or no the whole of the HCN present has been taken over in the first distillate. Results