the Chalky-Jurassic Boulder Clay fall into the Older Drift of the old classification, each separated by a hiatus of weathering and erosion. (2) The remaining glacial phases constitute the Newer Drift, of slight extent in the south but very strongly developed in the north and west[7]. (3) The most marked interglacial phase followed the Older Drift. (4) In East Anglia, or parts thereof, the Chalky-Jurassic Boulder Clay (youngest member of the Older Drift) was the maximum glacial invasion: in northern England and South Wales the maximum was the Upper Chalky Drift (oldest member of the Newer Drift). The flourishing condition of British highland ice at this later episode is of particular interest.

At the present juncture few British geologists seem to be prepared to interpret the British chronology in terms of the Alpine sequence. This has been attempted on archæological evidence[8], but there is a strong feeling that it is better to establish the initial sequence on its own merits, and not to introduce unnecessary complications until the second stage—European correlation—is attempted.

[1] T. Neville George, *Geol. Mag.*, May 1933, pp. 208–232, and other recent contributions by the same author therein mentioned.
[2] L. S. Palmer, *Proc. Geol. Assoc.*, **42**, 345, 361; 1931.
[3] W. S. Bisat, *Naturalist*, July and October 1932: F. M. Trotter and S. E. Hollingworth, *Geol. Mag.*, August 1932: A. Raistrick, *Trans. Northern Naturalists' Union*, **1**, Pt. 1, 1931, and *Proc. Yorkshire Geol. Soc.*, **22**, Pt. 1, November 1931. Dr. C. T. Trechmann is also taking an active part in these investigations.
[4] J. D. Solomon, *Proc. Geol. Assoc.*, **43**, 241–271; 1932. J. P. T. Burchell and J. Reid Moir, *Man*, February 1933.
[5] For bibliography and correlation of this region, with special reference to important work by Miss M. E. Tomlinson and F. W. Shotton, see some notes by the author of this review in *Geol. Mag.*, January 1932.
[6] J. P. T. Burchell and J. Reid Moir, *ibid.*, and NATURE, May 27, 1933, p. 756. Authorities on this district like Messrs. Chandler, Dewey, and others are still considering special problems.
[7] This was made especially clear in Mr. E. Dixon's correspondence with the writer.
[8] M. C. Burkitt, Handbook of the Prehistoric and Protohistoric Sciences Congress, London, 1932. (Oxford University Press.) H. Breuil, *Bull. Soc. Prehistorique Francaise*, No. 12, 1932.

Statistical Weather Forecasting

PROF. EMILE BOREL, the distinguished mathematician and former Minister of Marine in the French Government, gave a course of three lectures at the London School of Economics on November 14, 15 and 16, on "Quelques applications de la statistique aux previsions économiques (crises) et aux previsions meteorologiques". The first lecture, at which the French Ambassador presided, was devoted to a consideration of problems relating to the rate of interest and the devaluation of currency.

In his second and third lectures, Prof. Borel outlined a method of forecasting weather conditions. He first showed that, on the basis of observations at the Parc St. Maur Observatory near Paris over a period of fifty years, the greater the number of consecutive days upon which rain has fallen, the greater is the statistical probability that rain will fall on the next day. Likewise, the longer the duration of a rainless spell, the greater is the chance that the succeeding day will be rainless.

Taking the record of rainless days and of days of rain in the months October January in the fifty years, 1874–1923, Prof. Borel pointed out that rain fell on 52 per cent of the days. The probability that rain would fall on any one day between October 1 and January 31 is therefore 0·52. He has also tabulated the frequency of occurrence of spells of different durations of consecutive days of rain and of consecutive rainless days. The frequency of spells of one day of rain is 1,075. The probability of rain falling on any day being 0·52, the expected number of *second* successive days of rain is 559. The actual number is considerably greater, namely, 680, corresponding to a probability of 0·63 that after a first day of rain, at least one more day of rain would occur. The probability that after two consecutive days of rain at least one more would ensue is still higher, namely, 0·66. Despite some irregularity due to insufficiency of numbers of observations, the probability that, after an nth day of rain, precipitation would occur on the following day, increases with the value of n. The irregularities disappear if the probabilities are averaged in groups of three, except for a fall in the probability curve at about the fourteenth day. Prof. Borel believes that there may possibly be a critical period in winter rainfall in Paris, in the sense that a change is more likely to occur after about fourteen consecutive days of rain than at any other time. Analysis of the frequencies of continuous spells of rainless days reveals a similar increasing probability of continuance with increasing duration, and a similar indication of a critical period at about the fourteenth day.

Examining frequencies of the number of days classified according to the quantity of rain falling during the 24 hours, Prof. Borel finds indications that the probability that, n units of rain having fallen in a day, further rain would fall that day, increases with the value of n. He directed attention, however, to the fact that the units in which he has worked (millimetres) are arbitrary units, and different results might have been obtained if other units (say, inches) had been used.

Prof. Borel concluded by emphasising the desirability of basing further work on more abundant data than are yielded by the records of fifty years at a single meteorological station, as even this period gives small frequencies for spells of long duration and days of heavy rainfall. F. B.

Quantitative Analysis of Vegetation

SEVERAL attempts have been made in recent years to apply quantitative methods to the analysis of vegetation. The present position of such investigations formed the subject of a discussion held at the Linnean Society on November 23. The methods used may be divided into two classes: (i) those in which the object is to find a quantitative expression for the association as a whole; and (ii) those which are used to investigate the distribution of individual species within the association.

(i) Associations in Britain are conventionally described by a morphological method. The species are listed with approximate estimates of their relative abundance (dominant, frequent, rare, etc.). The variation from place to place in the association is described, and the description is illustrated by photo-