greatest influence on Helder, while Milan is the only one of the stations which has no appreciable effect. This is as might be expected when it is remembered that Milan falls within the influence of the Alps and the Mediterranean. Excluding Milan, it is found that the pressure oscillations at Helder may be accounted for to the extent of 94 per cent by means of the oscillations at the four remaining stations. It thus appears that local influences play only a subordinate part in the pressure variations at Helder, and that these latter are mainly controlled by the surges of pressure which pass over the station and the surrounding countries. The investigation covers the winter months only, so that this conclusion may not be applicable to the summer. For confirmation of these results two independent sets of three stations are taken and correlated with De Bilt. The results corroborate those already found, and it is concluded that barometric oscillations at a central point may be determined with great accuracy from as few as three well-chosen surrounding stations.

Difference of pressure and wind.

In a previous paper an investigation was made into the relation between the pressure gradient between certain stations and the surface wind.[2] The results were not entirely reliable, and in the present discussion statistical methods are employed to establish the connection. Variations from the mean value of the pressure differences between Flushing and five surrounding stations (x_1, x_2, . . . x_5) are related with the Flushing wind (x_6=north component, x_7=east component) by empirical equations of the type

$$x_6 = b_{61}x_1 + b_{62}x_2 + \ldots + b_{65}x_5,$$
$$x_7 = b_{71}x_1 + b_{72}x_2 + \ldots + b_{75}x_5.$$

The values of b_{61}, b_{62}, etc., are then determined from the observational data by the method of least squares. Making use of the resultant equations, it is found that a positive pressure gradient in the direction of Valencia produces a southeast wind at Flushing, in the direction of Biarritz an east wind, of Munich a northeast wind, of Neufahrwasser a northwest wind, and of Lerwick a southwest wind. The results both for velocity and direction of the wind are set out in a table, the surface wind which corresponds with each type of pressure gradient being given. A similar piece of work is carried out in which the average wind from four stations in the Netherlands is used in place of that from Flushing only, and by this means more regular results are obtained.—*J. S. Di*[*nes*].

[2] *See* Proc., K. Akad. wetensch., Amsterdam. Mar. 28, 1912. 14: 856-865. *Also in* Science abstracts, Sec. A, 1912, 15: § 642 (p. 207).

INTERNAL STRUCTURE OF EARTH AND MOON.[1]

By H. JEFFREYS.

[*Reprinted from* Science Abstracts, Sec. A, Nov. 25, 1915. § 1500.]

A discussion is given of the various hypotheses which have been formulated as to the internal structure of the earth, considering it to have a homogeneous metallic core surrounded by a rocky crust. The hypotheses in which either the shell or the nucleus is supposed permanently elastic have been shown to be highly improbable, so that the earth has the hydrostatic form throughout, Wiechert's hypothesis being the only possible one of this type. The paper further explains the large ellipticities of the moon by supposing it to have solidified while much nearer the earth than it is now. The fact that the moon always turns the same face toward the earth is shown to be not necessarily due to internal tidal friction, as in the absence of this the amplitude of the free libration in longitude would only increase with extreme slowness. If this amplitude had been reduced to a small amount before solidification, tidal friction would not be required in order to keep it small.—*C. P. B*[*utler*].

[1] *See* Mem. Roy. Astron. Soc., 1915, 60, 6, p. 187-217.