changes, that otherwise appear inexplicable, are by no means impossible in the light of the convection-hypothesis.

A last result, which has been found by a roughly approximate deduction, may be mentioned here. It was found that the difference of temperature of the substratum below the continents and below the oceanic crust, necessary for bringing about a difference of elevation of h Km. is about 25 h°. This figure does not appear excessive, when we realize that, according to the computations of HOLMES, the absolute temperature at a depth of 30 Km amounts to about 800°.

These last considerations, and the figures that have been given, are problematical and the writer should not wish to attach too much importance to them. Eventual doubts, however, don't affect our principal conclusions, the probability of convection-currents and the explanation that thus can be given of the extensive fields of positive anomalies at sea, that otherwise are difficult to account for.

Physics. — *Determination of capillarity constant by means of two spherical segments,* By J. VERSLUYS.

(Communicated at the meeting of January 27, 1934.)

In 1916 the author derived a formula expressing the tensile strength of moist sand [1]). This formula was based on the force required to break the small body of water (such a body was called a "*pendular body*") retained by capillarity between two spheres of the same diameter. It was then suggested that the capillarity constant of the liquid could be computed by measuring such force required to pull apart two segments of a sphere, which were held together by such a pendular body of a certain liquid. This suggestion was published in the Dutch language and received little outside attention. In 1927 however, the author had an apparatus constructed having segments with a radius of curvature of about 30 cm; an experiment performed with it by A. M. I. HOOGENDAM in the Laboratory of the BATAAFSCHE PETROLEUM MAATSCHAPPIJ in Amsterdam proved that the formula was satisfactory.

If R denotes the radius of curvature, σ the capillarity constant and γ the angle as shown in the figure, then the formula derived [2]) for the force required to break the pendular body is

$$P = \pi R \sigma f(\gamma)$$

where

$$f(\gamma) = 2 \sin \gamma - \sin \gamma \frac{tg\, \gamma}{tg\, \frac{\gamma}{2}} + \frac{tg\, \gamma}{tg\, \frac{\gamma}{2}} - \left(\frac{\pi}{2} - \gamma\right) tg\, \gamma .$$

[1]) „De capillaire werkingen in den bodem", Amsterdam 1916.

[2]) The reader is referred to op. cit., p. 78—83.

With a close approximation this formula can be written as

$$f(\gamma) = 2 \sin \gamma - 2 \sin \gamma + 2 - \left(\frac{\pi}{2} - \gamma\right) \sin \gamma = 2 - \frac{\pi}{2} \sin \gamma$$

if γ is small.

If r is the radius of the pendular body, one can write

$$f(\gamma) = 2 - \frac{1}{2} \pi \frac{r}{R}.$$

If the radius of the spheres is made 30 cm then the values of $f(\gamma)$ for various values of τ are:

r	$f(\gamma)$
0 cm	2.00000
0.1 ,,	2.00524
0.5 ,,	2.02616
1 ,,	2.05236

It is easy to make the radius r of the pendular body smaller than 0.5 cm, but even when it has this value, neglecting r causes a difference of only

$$\frac{2.02616 - 2.0000}{2} \times 100 = 1.3\,^0/_0.$$

If water is used at a temperature of 17° centigrade, then the force becomes

$$P = 30\,\pi\, f(\gamma) \times 0.07434 = 7.02\, f(\gamma) \text{ grammes.}$$

So for various values of the radius r the force becomes

r	P
0 cm	14.013 grammes
0.1 ,,	14.049 ,,
0.5 ,,	14.199 ,,
1 ,,	14.379 ,,

An advantage of the method given above is that the force to be measured is relatively large so that the errors become small.

Moreover the apparatus may be used to determine the interfacial tensions of two liquids, one of which wets the surfaces better than the other. By using segments of various materials, such as glass, quartz or some metal, the detection of apparent discrepancies may lead to a closer investigation into the phenomenon of wetting of different surfaces by different liquids.