MEASUREMENT OF DIFFERENCES OF HEIGHT BY TIDE-GAUGE.

(Extract from *Nature* - London - November 21, 1931 - p. 875).

Among other interesting papers and reports included in the *Comptes Rendus* of the fifth meeting of the Baltic Geodetic Commission at Copenhagen, Oct. 13 - 18, 1930 (pp. 275, *Ilmari Bonsdorff*, Helsingsfors, July 1931), is one by D. La Cour on the determination of differences of height by tide-gauge measurements in Denmark. Great difficulty has been found in levelling by the ordinary optical methods over the broad belts of water that separate the islands of Denmark from the mainland; large systematic errors have been found which render the results uncertain. La Cour has investigated the departures of the water surface in these belts from the horizontal, with the aim of avoiding the need for carrying an optical beam horizontally across the belts; this process of determining differences of height he calls "quasi-levelling". He has investigated the water level by tide-gauges at certain Danish stations, and has found a considerable systematic variation of level, depending on the pressure gradients between Shetland and Aaland, and Calais and Cracow; extrapolating to zero pressure gradient, he finds that the corresponding water level at Esbjerg is 28 cm. below mean water-level. He shows that changes in the mean water-level over a period of a few years can be deduced with a far smaller probable error when the correction to zero pressure gradient is made than when this is not done. He considers, also, the effect of the rotation of the earth in producing a difference of level across belts along which a current is flowing, and believes that this affords the most accurate means of estimating the difference of level. He finally suggests the experiment of laying a small lead pipe across the strait between Denmark and Sweden, in order to connect the levelling bases of the two countries.