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“A Determination of the Value of the Earth's Magnetic Field in International Units and a Comparison of the Results with the Value given by the Kew Observatory Standard Instruments.” By W. WATSON, B.Sc., F.R.S., Assistant Professor of Physics at the Royal College of Science, London. Received June 6—Read June 20, 1901.

(Abstract.)

A comparison of the readings given by the magnetometers used for measuring the horizontal component of the earth's magnetic field at the various observatories in Great Britain having shown the existence of very marked discrepancies, although the instruments employed are all of the same type, it seemed of interest to employ some entirely different method for the measurement of  $H$ , and to compare the results with those given by the unifilar magnetometers. This paper contains a description of such a measurement. The method employed consists in passing a known current through a coil of known dimensions and comparing, by means of a suspended magnetic needle, the field at the centre of the coil, due to the passage of the current, with the horizontal component of the earth's field. The current employed has been measured in two ways:—(1) by the deposition of silver in a voltameter, and (2) by a potentiometer method, in which the difference of potential at the terminals of a known resistance is balanced against the E.M.F. of a standard Clark or cadmium cell.

As a result, it has been found that taking the electro-chemical equivalent of silver as 0.001118, the value of  $H$  as determined by this galvanometer method is 0.00006 C.G.S. unit lower than the value given by the Kew Observatory standard instrument. If, as seems probable, the true value of the electro-chemical equivalent of silver is 0.001183 then this difference is increased to 0.00014 C.G.S. unit.