

the precise significance of these words, as lately determined by the Council of the Society.

Two courses appeared to be open; either to submit proofs to the authors of the abstracts of their papers sent to the Society, if any substantial (*i.e.* more than typographical) alteration had been made; in which case, the authors themselves would naturally bear the responsibility of their statements; or to throw the whole responsibility on the Editors, leaving them to make any excisions or alterations they may choose in the abstracts sent to them; or indeed, if they so think fit, entirely to rewrite them. The Council, in order to secure rapid publication, have chosen the latter alternative; and it should be understood that the abstracts are now "official"—*i.e.* the responsibility for all statements put forth rests solely on the Editors of the *Proceedings*.

WILLIAM RAMSAY.

University College, London, W.C., January 14.

### Philosophy and Natural Science.

WHILST feeling obliged to your reviewer's appreciation of my essay (p. 220), I am bound to rectify some very glaring discrepancies.

(1) As plainly stated in my preface, my essay has *not* obtained the Philosophical Society's prize, but only an "honourable recognition," and two fifths of the prize sum.

(2) Eighth line from bottom (p. 220), for "physical," read "psychical," as said in my paper (p. 30).

(3) Your reviewer makes me say: "Physical development is not the cause, but the effect of psychical development"; whereas, I have expressly *combated* this view of Wundt's (p. 32).

(4) Neither did I say: "The modifications in the brain and nervous system throughout the animal kingdom are intelligible as resulting from psychical causes . . ." but only (p. 32) that *in many cases* the beginnings of modifications are intelligible from the psychical side—*e.g.* the modifications of many organs—resulting from sexual selection.

(5) Lastly, far from saying that the high mental position of man, on the one hand, and of ants on the other, "is independent of the structure of the nervous system," my sentence (p. 34) is: "Here, where the organic substratum (*i.e.* the brain) in both types differs even in its principal morphological features, it is most evident how occult are the processes which constitute the proper material side of psychical phenomena."

Freiburg, Badenia, January 5. DAVID WETTERHAN.

(1) THE facts are that the Philosophical Society of Berlin offered a prize of 1000 marks for an essay on "The relation of philosophy to the empirical knowledge of nature."

The essay reviewed, only obtained 400 marks of this prize, and an honourable mention. In a hasty glance at the preface I overlooked the words "ein Antheil von vierhundert Mark," which occur in the next line to "der als Preis ausgesetzten Summe," which caught my eye.

(2) This is evidently a slip of the pen, which I regret was overlooked in proof.

(3) In my notes, jotted down as I read the pamphlet, I put Wundt's words in quotation marks, intending to point out Mr. Wetterhan's opposition thereto; but in writing the review, I unfortunately omitted the commas, and, I regret, entirely misrepresented the author's views. Perhaps I may quote from p. 32 of the pamphlet: "Man dürfte Wundt's Satz, 'dass die physische Entwicklung nicht die Ursache, sondern vielmehr die Wirkung der psychischen Entwicklung ist,' zu weitgehend, und auch in seinen Konsequenz bedenklich finden." We are then referred to page 46, where we read: "Der Ausführung dagegen, welche Wundt (s.o. p. 32) jenem Prinzipie gegeben hat, vermag ich kaum eher beizustimmen, als der verwandten Ideen Schopenhauer's."

(4) It appears to me that the passage will bear the construction which I put upon it; though perhaps "throughout" the animal series is too inclusive as a rendering of "der Tierreihen."

(5) The author had been discussing the similarity of habits and instincts in ants and termites, and then remarks that there is a distinct agreement in the mental functions ("von geistigen, ja gemüthlichen Funktionen") of bees with those of the higher

animals. He refers to Darwin's opinion that the small brain of a bee is a more wonderful thing than the brain of a Man: and I think I was entitled to make the obviously true remark that this "mental development is independent of the structure of the nervous system." I was not quoting Mr. Wetterhan's words, but giving the general sense of the passage.

In conclusion, I must express my regret that the condensation of some of the author's remarks should have resulted in a confused expression of his views. THE REVIEWER.

### SOME EARLY TERRESTRIAL MAGNETIC DISCOVERIES PERTAINING TO ENGLAND.

IT should be a source of considerable pride to British men of science that so many of the discoveries in terrestrial magnetism have been made in England. And yet, owing to the absence of a complete and carefully written history of the development of this science, probably few could enumerate all the achievements in this subject by Englishmen.

In February 1893 the writer had the good fortune to light upon a book,<sup>1</sup> by Will Whiston, containing matter pertaining to the terrestrial magnetism of England, which appears to have been entirely overlooked by prominent terrestrial magneticians. Owing to pressure of work, this interesting book, of which a copy was found in the Royal Library of Berlin, could not be subjected to a critical examination until the early part of 1894, when the writer called the attention of prominent Berlin investigators, such as Prof. Hellmann and Dr. Eschenhagen, to it.<sup>2</sup> In the meantime, Dr. W. Felgentraeger, Assistant at the Göttingen Magnetic Observatory, made an independent discovery of Whiston's book, and carefully worked up part of the material contained therein.<sup>3</sup> The writer has since found time to complete his examination of Whiston's contribution, and has embodied his results in a paper<sup>4</sup> presented by Prof. Cleveland Abbe before the Philosophical Society of Washington on November 10, 1894. In the following these results will be briefly sketched.

As will appear from the title of Whiston's work, the chief object was the exposition of a method for determining the longitude and latitude by means of the magnetic dip-needle, *i.e.* by means of the angle which a magnetic needle mounted on a horizontal axis, when placed in the vertical plane of passing through the magnetic meridian, makes with the plane of the horizon. It will be recalled that at that time great prizes had been offered by the English Parliament for an easy and trustworthy method of determining longitude at sea. From the very birth of terrestrial magnetism we find methods proposed for determining longitude by means of magnetic observations, and, like the problem of perpetual motion, these magnetic methods were revived every once in a while until the beginning of the nineteenth century. Owing to the irregular distribution of magnetism within the earth's surface, and on account of the many fluctuations terrestrial magnetism is subject to, these magnetic attempts to determine geographical position have been doomed to failure. They, nevertheless, have done much to promote the science of terrestrial magnetism. A striking instance of this is the book of Whiston's. The prime object of the book has failed of

<sup>1</sup> "The Longitude and Latitude found by the Inclinary or Dipping Needle; wherein the Laws of Magnetism are also discover'd. To which is prefix'd an Historical Preface; and to which is subjoin'd Mr. Robert Norman's New Attractive, or Account of the first Invention of the Dipping Needle." By Will Whiston, M.A., sometime Professor of Mathematicks in the University of Cambridge. (London, 1721. 8vo, xxviii. 115, iv, and 43 pp. 2 charts and 3 cuts.)

<sup>2</sup> See remarks in *Physical Review*, vol. ii. No. 1, p. 72.

<sup>3</sup> "Die Isokline-karte von Whiston und die säkulare Aenderung der magnetischen Inklination im östlichen England." Von W. Felgentraeger. Reprint from *Nachrichten der k. Gesell. der Wiss. zu Göttingen Math. Phys. Klasse*, 1894. No. 2. 8vo, 12 pp.

<sup>4</sup> Entitled "The Earliest Inclines and Observations of Magnetic Force." (*Bull. Phil. Soc., Wash.*, vol. xii. pp. 397-410.)