

is no using of differences, proportional parts, or anti-logarithms. In his introduction the author works out some examples with ordinary unaccented five and seven-figure tables, and with these accented tables. On the hypothesis that the tables are correctly printed—we have detected no error—we commend this book as being one that will save much time in calculation without entailing a loss of accuracy. The figures are very clearly printed.

### LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

#### The Earthquake of Ischia

In NATURE, August 30, p. 414, a correspondent remarks: "The recent catastrophe in the Island of Ischia has called the attention of those who make a study of such disturbances of the earth's surface to the simultaneous occurrence of earthquakes in various parts of the world"; while in NATURE of August 16, p. 368, Mr. Milne, in his article on "Earth Pulsations," says: "The directions in which these tips of the soil take place, which phenomena are noticeable in seismic as well as microseismic motions, Rossi states are related to the directions of certain lines of faulting."

With a view to call attention to the connection between earthquakes occurring in different parts of the globe, either simultaneously or successively, I submitted to the British Association at Swansea a paper on the relation between coast-line directions and local ties in Europe marked by frequency of earthquakes, as also a map illustrative thereof. In this paper, and in a previous one published in the *Transactions of the Royal Irish Academy*, I started with, and endeavoured to prove, the principle laid down by Rossi as to the connection between lines of faulting and earthquake movements, and the map submitted tended to show this relation as being very marked for certain lines of direction.

I now beg leave to call attention to the following lines of action shown thereon in relation with the Ischia earthquake. Amongst the lines cited were those of the *east coast of Sweden* and *east coast of Sardinia*, both nearly parallel, and thereon marked. As regards the first, I state in the memoir (p. 508 of the *Proceedings of the Royal Irish Academy*, 2nd series, vol. iii.; *Science*, No. 8, May, 1882):—

"The section of this line between Rome and Rimini is one of the best marked earthquake lines in Italy, whilst the section between Pola and Brück is also well defined as a direction by a series of points along which shocks have been continually occurring." I further add: "Between Palermo and Naples a parallel to this coast-line seems to be marked by earthquake movements cited as having extended from one point to the other (April 16, 1817)." Now this line passes precisely at Ischia, and, being extended, passes at or near the following places noticeable for earthquakes:—

Corleone, Palermo, Ischia, Teano, Isernia, Lanciana, Grossa Island, Neustadt (Carmola), Marburg, Semering Pass, Neuburg (near Vienna), Znaim, Glatz, Breslau. Its prolongation represents the axis of the Baltic and the coast-line of Finland from Nystad to Bjornborg.

The west coast of Sicily furnishes a parallel to this direction, and on it are the following earthquake points:—

Frosinone, Aquila, Aseoli, Laybach, Hirschberg, the Riesengebirge, Glogau, and quite recently (May) the points in Finland—Nykerleby, Wasa, and Itterseppo.

Although unacquainted with the geology of the countries traversed by these directions, I am convinced that there occurs marked jointing both in Sicily and in Italy corresponding to the direction of these lines, about N. 10° 30' E.

It seems to me that they furnish a means of connecting these phenomena, and that they allow of some approach being made to the determination of the laws which govern the occurrence of earthquakes in these parts of Europe.

J. P. O'REILLY

#### Mr. Romanes and Modern Philosophy

As an adherent of the school of thought which Mr. G. J. Romanes (NATURE, vol. xxviii. p. 387) has subjected to such a spirited criticism, I may perhaps be allowed to make a few comments upon his position.

If all science, at least all that has outgrown the mere registration of facts, consists in the application to the latter of certain necessary principles of thinking, it is at least possible that philosophy—an important part of whose function is the systematic elucidation of these principles—may be of some use in scientific procedure.

Mr. Romanes, if he accepts the fact that nature is an object of knowledge, cannot deny that it is governed by the essential conditions of knowing. It is usual, but hardly fair, to confound such obvious statements with the subjective idealism which "makes the universe revolve round the philosopher." A necessary principle is one that evidently does not apply simply to the experience of a single man, a corollary that ought to have much confusion concerning the relations between mind and matter. If, too, it had been recognised that such principles admit of no ulterior possibilities, we would have been spared the controversy about non-Euclidean space.

With regard to their application to facts of experience, or conceptions derived from these, it may be remembered that the sciences in whose results we place the most confidence—*e.g.* mathematics, mathematical physics, and astronomy, are chiefly deductive. With regard to the portions of these which apparently consist of empirical generalisations, it should not be impossible to show that they, in common with the whole of mathematical science, really flow from the constitution of our experience of nature.

In dealing with the question of mechanism and teleology it is a common error to think that in using the higher categories there is any supersession of such principles as those of cause and effect. As objects of outer experience, organisms are certainly conditioned by the latter; but when they are regarded as subjects, as well as objects, we are compelled to recognise the one-sidedness of such categories—to read into them, as it were, our own active subjectivity. Even the most dogmatic materialist might suspect that the conception of cause and effect is not adequate to a complete solution of the problems presented by living beings. In accepting causality, then, as a truth of universal application, it is not in any sense unscientific to regard it as merely one among the principles which regulate nature.

With regard to the special applications of teleology (in the philosophical sense), it is easy to find instances of incorrect deduction, because of the undeveloped condition of this portion of the subject. Treatises upon it can therefore only be considered as suggestive. Mr. Romanes seems to fear that such efforts will create a dogmatism fatal to scientific progress, although he is aware that the tendency of the times is in exactly the reverse direction. The *a priori* of modern philosophy is of a far different nature from that of scholasticism, and may be in many cases quite as scientific as that which determines the impossibility of perpetual motion, or prophesies a transit of Venus.

Crewe, August 30

ALFRED STAPLEY

#### Animal Intelligence

THE columns of NATURE have sometimes been open to statements illustrating the practical sagacity of animals of the lower classes. Allow me to place before you the history of an occurrence which appears to prove the power of organisation in the common house-mouse.

The room to which I shall refer is one of several which were built as additions to the original house; it was used solely as a bedroom. I think it very probable that the old and the new apartments were so united that there was no clear mouse-way between them.

I had been sleeping alone in the room, I believe for several weeks, without any disturbance. One night I was woken up, I believe some hours after midnight, by such a grinding under the floor as I never heard before. It was evidently useless for me to attempt to interrupt it, and indeed I was rather curious to observe what would ultimately happen, and I lay quiet in bed. Daylight approached, and still the grinding continued. At last the noise suddenly ceased, and in a minute the room seemed to be filled with mice, running about in every direction. I did not, however, perceive that they mounted the bed or the bed-furniture. At last I perceived a mouse ascending the wall. In my full