

of the coal-tar colour industry has, we think, not been without its influence on the development of this branch of applied organic chemistry in this country. Dr. Knecht's translation merits a place on the bookshelf of every person engaged in the manufacture and use of the so-called coal-tar colours.

A Bibliography of Geodesy. By J. Howard Gore, B.S., Ph.D. (Washington: Government Printing Office, 1889.)

THIS valuable work forms Appendix No. 16 to the 1887 Report of the United States Coast and Geodetic Survey, and is another example of the disinterested energy displayed by our Transatlantic cousins in scientific matters. With great perseverance, and at the cost of much time and trouble, Mr. Gore personally explored thirty-four of the principal libraries of America and Europe, and numerous minor libraries by proxy; and, in addition, he checked and completed many of his references by correspondence with the living authors of both continents. The extent of his labours is shown by the four hundred columns of references, and short remarks where the title alone is not sufficiently explanatory. An alphabetical arrangement is adopted, and this includes authors, abbreviations, and subjects.

It is gratifying to note that our own country, besides the assistance rendered by its libraries, lends its aid to such an important work in the shape of a manuscript supplement by Colonel Herschel to his pendulum bibliography, which was placed unreservedly at Mr. Gore's disposal, through the courtesy of the Royal Society. After the offers of publication made by various institutions, including the International Geodetic Association at Berlin, no further testimony to Mr. Gore's fitness for the work is needed, and the compiler is justly proud "to see the results of his labours issuing from an institution of his own country, which throughout the world is the recognized advance guard in geodetic science."

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 intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

The Method of Quarter Squares.

I OMITTED any reference to Leslie in my review of Mr. Blater's table (NATURE, vol. xl. p. 573), as I have never supposed that he was an independent discoverer of the method, or an independent calculator of a table, of quarter squares. I have referred to his table in my Report on Mathematical Tables Brit. Assoc. Report, 1873, p. 23; and the passage quoted by Prof. Carey Foster (p. 593) is given in full in the preface to Mr. Blater's table. It seems to me that the words in question—"This application of a table of quarter squares, as it is derived from the simplest principles, might have readily occurred to a mathematician; yet I have nowhere seen it brought into practical use till, last summer, I met with, at Paris, a small book by Antoine Voisin, printed in 1817"—do not indicate an independent discovery; and this view is confirmed by the fact that, in the first edition of the "Philosophy of Arithmetic" (1817), Leslie makes no mention of quarter squares. It was only in the second edition (1820), after having seen Voisin's work in the previous year, that he added, at the end of the volume, an account of the method, and a table extending to 2000. The table was copied, I presume, from Voisin, as Leslie does not claim it as the result of his own calculation. In the British Association Report I have described it as "reprinted from Voisin," and have pointed out that it did not appear in the first edition. In the preface to Mr. Blater's letter it is described as "an extract from Voisin's table." Although we may, I think, infer, almost

with certainty, that the table is only a reprint,¹ it is to be regretted that Leslie did not say so explicitly.

J. W. L. GLAISHER.

Trinity College, Cambridge, October 26.

Darwinism.

MR. ROMANES states that it is "absurd" to call his essay on physiological selection an elaborate (I said "laborious") attack upon Mr. Darwin's theory of the origin of species. In that essay I find these words (p. 345), "the theory of natural selection has been misnamed: it is not strictly speaking a theory of the origin of species"; and on p. 403, "the theory of physiological selection [i.e. Dr. Romanes's theory] has this advantage over every other theory that has ever been propounded on the origin of species"; and again, "the problem of the origin of species which, as shown in the preceding paper [viz. the laborious essay], his [Mr. Darwin's] theory of natural selection serves only in small part to explain."

On the other hand, Mr. Darwin entitled his great work, "The Origin of Species by means of Natural Selection, or the preservation of favoured races in the struggle for life." He considered his theory of natural selection to be a theory of the origin of species. Mr. Romanes says it is not. I say that this is an attack on Mr. Darwin's theory, and about as simple and direct an attack as possible. Why Mr. Romanes wishes us to believe that he did not attack Mr. Darwin's theory it is difficult to conceive. That he should hope to persuade anyone that it is absurd to call his essay an attack on Mr. Darwin's theory when this is what it distinctly professes to be is curious. I trust you will not permit an empty discussion on this matter, but leave it to your readers to find out by reference to the Proc. Linn. Soc., vol. xix., where the absurdity exists.

E. RAY LANKESTER.

42 Half-moon Street, November 1.

Record of British Earthquakes.

WILL you allow me to ask your readers to help me in compiling notes of the earthquakes felt in this country during the present and following years?

Mr. Mallet's great Catalogue of all recorded earthquakes ends, as is well known, with the year 1842. Previously to this, Mr. David Milne had published a series of papers on the earthquakes of Great Britain in the *Edinburgh New Philosophical Journal* (vols. xxxi. to xxxvi. for the years 1841-44). These papers, which are of very great value, bring down our record to the end of August 1843. In recent years we have had the Catalogues of Prof. J. P. O'Reilly (Trans. Roy. Irish Acad., vol. xxviii. pp. 285-316 and 489-708) and the late Mr. W. Roper (published by T. Bell, Observer Office, Lancaster). The latter is a useful chronological list of shocks felt during the Christian era, down to February 10, 1889; but, except in a few cases, it is little more than a list. Prof. O'Reilly's important catalogues are arranged alphabetically according to the localities affected, and do not pretend to give detailed information with reference to the shocks themselves.

To make our seismic record more complete, I propose, therefore, to compile a descriptive list of British shocks noticed in newspapers and scientific journals from the time at which Mr. Milne's Catalogue closes down to the end of the year 1888; and I should be very grateful if your readers can in any way help me in this work.

What I wish particularly to ask for, however, is information relating to the shocks of the present and future years. For our knowledge of British earthquakes we must at present rely to a great extent on newspaper accounts; and these accounts, which for some points are fairly trustworthy, become difficult of access in after years. If any of your readers are willing to assist me in preserving these notices in a convenient and systematic form, may I ask if they would be good enough to send, to the address below, the names and dates of newspapers, and more especially local ones, in which any descriptions, however short, are given of British shocks? It is hardly necessary to say that any other notes, communicated by those who have felt the shocks or observed their effects, would be of great value, and would be most thankfully received.

The days are past for compiling earthquake catalogues for the

¹ After quoting the full title of Voisin's table, Leslie refers to his own table as "the specimen which I have given."

whole surface of the earth, and the value of an attempt at such a task would now be extremely doubtful. But for limited districts, like this country, the case is very different. It would indeed be difficult to over-estimate the value of a seismic record which can claim any approach to completeness for a definite earthquake area, however feeble the shocks which visit it may be.

I may add that I hope shortly to publish some notes or directions for the study of earthquakes, with special reference to those which occur in this country. CHARLES DAVISON.

38 Charlotte Road, Birmingham, October 10.

Effects of Lightning.

I HAVE known of the following case since July last, but owing to absence from this place have only been able to get particulars during the last few days.

During the terrific storm of the 12th of July last, a labourer's cottage was struck by lightning at Leagrave, near here. The lightning descended, according to an eye-witness's report, like a "spout of fire," and struck and descended the chimney, which it destroyed. In the room below there was an old shepherd, an invalid woman, a child, and a shepherd's dog. The shepherd was sitting in a chair leaning on a stick, a kettle was boiling on the fire, and the door was open. The lightning entered the room simultaneously by the chimney and an adjoining window. The window was utterly destroyed, and the kettle was thrown from the fire across the room, the stick on which the shepherd was leaning was torn from his hand and also thrown across the room, the lightning entered a cupboard containing glass and crockery and destroyed every article, and plaster was torn from the walls. The man and woman remained unhurt, but the child was thrown down and its knees stiffened. The dog was struck perfectly stiff, "like a log of wood," and was considered dead. The room seemed full of fire, water, and sulphur, and the occupants said the smell of sulphur was so strong that they would certainly have been suffocated had it not been for the open door. After the storm had abated, the dog, with all its limbs stiff, was laid in a barn, where it very slowly and partially recovered. It long remained both deaf and blind, and was entirely dependent upon smell for its recognition of persons and things. To the present day it has not entirely recovered its injured senses.

Dunstable.

W. G. S.

Electrical Cloud Phenomenon.

A SHORT description of a curious cloud appearance observed by me this summer may be of interest to your readers. It was noticed in Kiushu, the southernmost of the three great islands of Japan, early in July, at a distance of ten or twelve miles from the sea.

The season had been, and was, after the time of the observation, an exceptionally rainy one, severe floods being produced in almost all parts of the country, but it was not raining in the place where I made the observation at that particular time. Time shortly after midday, thermometer about 85° F.

The sky was clear overhead, but there was a great bank of heavy "thunderous" looking clouds to the south. It is most difficult to judge even approximately of the distance of clouds, but these might be from one to two miles off; the lower edge was represented by a very nearly straight line, and there was an amount of blue sky visible under the clouds that would perhaps subdivide from 10° to 15°.

My attention was attracted to a sort of "tail" of cloud stretching itself downwards from the straight under side of the cloud-bank. It gradually extended till it reached some two-thirds of the distance from the cloud to the earth. It remained of about constant length for a little over ten minutes, the lower end continually waving about in a most curious way, giving the impression almost that it was feeling for something.

Quite suddenly the filament of cloud straightened itself out, and extended itself towards the earth. The lower end became so very thin that, from the distance, it was impossible to see whether it actually made contact with the earth or not, but I have not the smallest doubt that it did, and that a silent discharge took place at the time. There was certainly no sound heard. Immediately after the contact the filament rapidly drew itself up to the cloud, and was incorporated with it. Almost immediately after this, whether as a mere coincidence or not I cannot tell, the cloud discharged a great amount of rain.

W. K. BURTON.

Imperial University, Tokio, Japan.

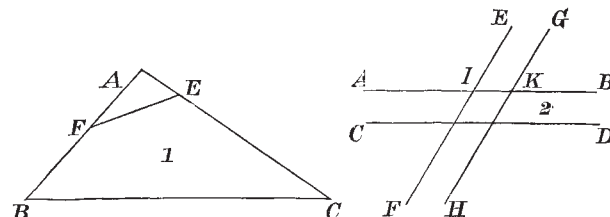
P.S.—The appearance was not unlike the illustrations of "water-spouts" that I have seen, but there was no whirling motion such as is always described as accompanying these, nor, indeed, was there any evidence of violent disturbance of any kind at all.

The Use of the Word Antiparallel.

THE following note on the use of the word antiparallel may prove of interest to the readers of NATURE.

In the second edition of "A New Mathematical Dictionary" by E. Stone, F.R.S. (London, 1743), appears a short article on antiparallels, the whole of which I will quote:—

"Antiparallels, are those lines, as FE, BC, that make the same angles AFE, ACB, with the two lines AB, AC, cutting them, but contrary ways, as parallel lines that cut them. But Mr. Leibnitz, in the *Acta Erudit.*, An. 1691, p. 279, calls antiparallels those lines (see Fig. 2) as EF, GH, which cut two parallels AB, CD; so that the outward angle AIF, together with the inward one AKH, is equal to a right angle. When



the sides AB, AC, of a triangle, as ABC (Fig. 1), are cut by a line EF antiparallel to the base BC, the said sides are cut reciprocally proportional by the said line EF; that is, $AF : BF :: EC : AE$, the triangles AFE, ABC being similar or equiangular."

The error in regard to the ratios of the segments of the sides is the same as the one noted in Hutton's "Miscellanea Mathematica," as quoted by Mr. Langley. I have no doubt that earlier instances of the use of this word can be found, and I would like to know whether the word is used in the first edition of "Stone's Dictionary."

W. J. JAMES.

Wesleyan University, Middletown,
Conn. U.S.A., October 15.

Fossil Rhizocarps.

IN Bennet and Murray's "Cryptogamic Botany," at p. 115, I am surprised to find in a reference to my paper on "Fossil Rhizocarps" (in *Bull. Ac. Sciences, Chicago*) the statement, with reference to the macrospores of *Protosulvinia*, that "inasmuch as they are borne on *Lepidodendron* scales this reference is inadmissible." Now no such fact has come to my knowledge, and on the contrary these bodies are found inclosed in cellular sporocarps like those of *Salvinia*, and are so described in the paper in question. If anyone has found them on "scales of *Lepidodendron*," the authority should have been stated.

Montreal, October 15.

J. WM. DAWSON.

Specific Inductive Capacity.

ON p. 669 of Ganot's "Physics" (eleventh edition) the following statement is found:—"At a fixed distance above a gold-leaf electroscope, let an electrified sphere be placed, by which a certain divergence of the leaves is produced. If now, the charges remaining the same, a disk of sulphur or of shellac be interposed, the divergence increases, showing that inductive action takes place through the sulphur to a greater extent than through a layer of air of the same thickness."

If this statement were correct, there should be less electric action on the side of the ball furthest from the electroscope when the dielectric is interposed. To test this I arranged an experiment as follows:—

The knob of a charged Leyden jar was placed midway between two insulated plates of metal, each plate being in connection with an electroscope. The leaves of each electroscope now diverged to an equal extent.

A plate of ebonite was now placed between the knob of the jar and one of the plates. If the statement above quoted is