having been a shallow-water deposit was "based exclusively on the present habits of the very few genera of Mollusca that have survived from the Chalk period, and seems quite in contradiction to the far more important groups, the Sponges, Echinodermata, and the minute organisms of which the formation is so largely composed, while no opinion has yet found its way into the hands of geologists regarding the depth of water indicated by the Crustacea and the fishes of the Chalk." Mr. Gardner appears to have overlooked that passage in my Address to the Biological Section of the British Association (to which he refers in his letter), wherein I added, "Mr. Woodward tells me that the Chalk Crustacea are shallow-water forms." Dr. Woodward is certainly no mean authority on fossil Crustacea. As to the surviving genera of Chalk Mollusca being "very few" in number, I would refer him and my readers to the long list of genera given in my Address, which was furnished by our great palæontologist, Mr. Etheridge, and to the exclusively littoral habits of some of those genera. And with respect to the Sponges, Echinodermata, and minute organisms being "far more important groups" than the Mollusca, I must leave that question to naturalists in general. Sponges (silicious as well as horny or ceratose), and Echinoderms are notoriously not restricted to deep water. Quite the contrary. They live at every depth from the shore between tide-marks to the abyssal and benthal zones. The "minute organisms" which enter so largely into the composition of the Chalk, for the most part, if not entirely, inhabit the surface of the sea. J. GWYN JEFFREYS

June 30

Protoplasmic Continuity in Plants

IN the very interesting article on "The Continuity of the Protoplasm through the walls of Vegetable Cells," which appeared in NATURE of June 19 (p. 182), reference is made to the doubt which still exists as to "whether the continuity is maintained from the earliest stages, or is established later." This point is so important in its physiological bearings, as the article goes on to show, that I may, perhaps, be allowed to state that, with regard to one group of plants, the question appears to be already settled. I allude to the Red Sea-weeds or the *Florideæ*. The writer of the article makes no mention of these plants, but, as I have described elsewhere (see *British Association Report*, 1883, p. 547, and *Journal of Botany*, February and March 1884), many of them exhibit a very notable system of intercellular connections, which, extending over the whole thallus, renders the protoplasm practically continuous from the base of the frond to the extremities of its furthest ramifications. Now in these cases the continuity is certainly maintained from the first, and is due to the mode of cell division by which the thallus is built up. Into the details of this there is no need to enter further than to say that, when the protoplasmic body of a cell divides into two or more portions, these do not become completely separated from one another, but remain connected *inter se* by strands of protoplasmic material, which grow in thickness with the growth of the cells, and thus maintain the continuity from the earliest stages onward. So far, then, as concerns the *Florideæ*, I venture to think the physiological import of the phenomena of continuity may be safely discussed on the assumption of its existence *ab initio*. What that import may be I do not propose to consider, my object being simply to point to the *Florideæ* as throwing valuable light on the whole subject, and giving some support to the view that "the entire plant or organ is practically one whole—one mass of protoplasm cut up into chambers which communicate with one another, and bounded by a membrane on the exterior." THOMAS HICK

Aseismatic Tables for Mitigating Earthquake Shocks

WITH respect to Mr. C. A. Stevenson's letter in your last issue (p. 193), I may state that my information was obtained from Mr. R. H. Brunton's paper on "The Japan Lights" in *Proc. Inst. Civ. Eng.*, vol. xlvii., pp. 6-8, 35, and from the communication by Messrs. Stevenson in the "Discussion" on that paper (pp. 26-29). The results referred to by Mr. Stevenson have, perhaps, been obtained since this paper was read (November 14, 1876). W. TOPLEY

28, Jermyn Street, London, June 27

Black Rain

A REMARKABLE shower of black rain fell here and in the neighbourhood last Sunday, the 22nd inst. The forenoon had been fine, though somewhat hazy, but about 3.30 p.m. heavy cumuli formed to north and north-west. Gradually a dense mass of cloud and haze came from the northward, presenting a lurid, threatening aspect, and it become so dark that one could not read a book indoors. At 4.30 rain began to fall, at first a few drops, and soon after a heavy downpour. When this commenced I noticed a number of black objects floating in the air, which I at first took to be flies or winged ants, but they rapidly increased in number, and on looking at them more closely I found them to be particles of soot, on an average about the size of the common fly. Their number was so great that, it appeared for ten minutes to be snowing black, the descent of the blacks being slow, like that of snowflakes. After it had rained heavily for fifteen minutes, these "blacks" ceased and the air became lighter, but the rain continued for another hour, and altogether I measured ·30 inches in my gauge. I find on inquiry that this black rain was noticed in the whole neighbourhood—at least four miles to the north-east and two miles to westward, hence it cannot have been due to local chimneys. As far as I can ascertain, the shower was entirely local; it seems to have followed a narrow course from north to south only a few miles wide, and did not extend to either Eastbourne or Hastings.

Fletching, Sussex, June 24 W. J. TREUTLER

A Cannibal Snake

RATHER a strange occurrence came recently before my notice, and thinking perhaps you might care to insert it in your columns, I send you the facts of the circumstance. A few days since, towards evening, I killed a snake just close behind my house; it measured about a yard and a half in length, was one of the most deadly of the numerous kinds of snakes found in Java, and bears the name of "Oelar belang." On examining it later I found what I thought to be the tail of another small snake protruding from its mouth, but on pulling it out I was greatly surprised to discover that it was really a snake of the same species, and of almost the same length. There was certainly not more than three inches' difference in the length of the two snakes, and at the time I killed the outside snake only about an inch and a half or two inches of the tail of the one he had swallowed protruded from his mouth. The outside snake was of course considerably the thicker of the two, but this may be attributed to his having swollen after, or rather during, his tremendous meal. The natives here say that the two snakes must have been fighting, the victor afterwards swallowing his opponent. I should be pleased to know whether such an instance has ever before been brought before your notice, or whether it is really an uncommon case. EDWIN H. EVANS

Soemedang, Java, May 20

Peronospora infestans

ON the 22nd inst. I observed that this fungus had appeared on the haulm of the potato crop in one or two places in my garden in this city. On examining to-day a potato crop in another garden a mile distant from mine, I perceived that that crop was likewise affected. Considering the dryness of the spring weather, the appearance of the disease is remarkable. According to my observation, the attack of the mould is a month earlier than usual. It may be added that hereabouts, this season, blight of all kinds is prevalent, while last year was blight free. Inclosed is a specimen of diseased haulm. J. LL. BOZWARD

Worcester, June 24

KEPHIR

IN No. 10 of the *Journal of the Berlin Chemical Society* for June 23 is a communication on this substance by M. Struve of Tiflis, continued from a previous note in the same journal of February 25.

Kephir is a form of fermented milk which has been prepared and in use amongst the inhabitants of the Northern Caucasus for a great length of time, and occupies with them a similar position as an article of diet and medicine to that of kumis in the south-eastern steppes of Russia.

Kumis was first brought into notice in 1784, and has since then been pretty fully investigated and taken a definite position, but kephir has only been generally

known even in Russia for about two years, although several notices of its medicinal properties have been contributed to the Caucasian Medical Society. The knowledge and spreading use of this new drink in Russia dates apparently from an investigation and paper read on this new ferment product by E. Kern at the Moscow meeting of the Imperial Naturalists' Society in 1881.

Kephir is prepared by fermenting milk, either sheep's, goats', or cows' milk, with what are termed kephir-grains, the process taking place in leather bottles (*Burdinks*). These grains are the ferment proper, the leather bottle not being supposed to be absolutely necessary. During the fermentation the milk becomes very much changed, and at the same time there is a reproduction of the ferment substance or kephir-grains, which is removed after a certain stage of fermentation has been reached, and after drying in the sun may be preserved, and serves again to effect the fermentation process. Nothing is known of the origin of this peculiar ferment. An analysis of the grains dried at 100° C. gave :—

Water	11·21
Fats	3·99
Soluble peptone substances	10·98
Proteids soluble in ammonia	10·32
,, ,, potash	30·39
Insoluble	33·11

The insoluble residue exhibited under the microscope an intimate mixture of yeast-cells, and the *Bacterium dispora caucasica* with a few Leptothrix and *Oidium lactis* possibly as accidental. This 33·11 per cent. of insoluble matter seems to be the only active part of the kephir grains. On preparing some kephir in bottles with this, the product became slightly effervescent after twenty-four hours, and contained a small amount of alcohol. After three days the amount of alcohol and carbonic acid was much increased. On making an examination of the fermented liquid after one, two, and three days respectively, the quantity of casein found was practically the same in each case. But on treating the casein so obtained with dilute ammonia and then dilute potash solution, in no case was there a complete solution. An amount of insoluble residue was obtained from the *third-day* experiment of ·22 per cent. of the casein, and which consisted entirely of yeast-cells. From this is concluded that the fermentation of the milk is entirely due to *Saccharomyces mycoderma*, the *Bacterium dispora caucasica* not taking any part in the fermentation, and this seems to be further supported by the fact that the "finished" drinkable kephir will start fermentation in fresh milk in the same manner as the kephir-grains.

The *Bacterium "dispora"* which Kern noticed, and to the action of which he ascribed the peculiar properties of kephir, probably results, in quite a secondary manner, from the employment by the people in the Caucasus of the old leather of the bottles in which kephir has been fermented. In this process in leather bottles the yeast-cells are in contact with the leather, and to some extent possibly grow or extend into it, so that they become modified physically, and the rapidity of fermentation is much lessened. Any animal tissue which has become, as it were, saturated or penetrated by yeast-cells is capable of causing sugar solutions and also milk to ferment, and can therefore be used in place of these kephir-grains for the preparation of kephir.

HENRY WATTS, F.R.S.

WE regret to announce the death of Mr. Henry Watts, F.R.S., the well-known chemist; he died on June 30, of syncope from failure of the heart's action, after a very short illness.

Henry Watts was born in London on January 20, 1815. He was educated first at a private school in London, and subsequently attended lectures at the University College, London. In 1841 he graduated as Bachelor of Arts in the University of London. In 1846 he entered the Birkbeck Laboratory of Chemistry, then recently established at University College, as assistant to his highly valued friend, the late Prof. Fownes, and in that capacity was engaged in directing the work of the students till the death of Prof. Fownes in 1849, and afterwards till 1857 under Prof. Williamson. In 1848 he was engaged by the Cavendish Society to prepare a translation, with additions, of the great "Handbuch der Chemie" of Leopold Gmelin, a work which extended to eighteen volumes, and occupied a large portion of his time for more than twenty years, the last volume and the index having been published in 1872.

In 1858 he began to prepare a new edition of "Ure's Dictionary of Chemistry and Mineralogy"; but finding that this book, the last edition of which appeared in 1831, had fallen too much behind the existing state of chemistry to be made the groundwork of a dictionary adapted to the requirements of the time, he undertook, with the consent of the publishers, and the assistance of a staff of contributors distinguished for their attainments in different branches of physics and chemistry, the compilation of a new "Dictionary of Chemistry and the Allied Branches of other Sciences." This work, in five large octavo volumes, was completed in 1868; but as additions were required to keep it abreast of the continual advances of science, a supplementary volume was published in 1872, a second supplement in 1875, and a third (in two parts) in 1879 and 1881.

Mr. Watts brought out three editions of "Fownes's Manual of Chemistry," viz. the tenth, published in 1868, the eleventh in 1872, and the twelfth in 1877, and also part 1 of a thirteenth, in 1883.

He held for many years the appointments of editor of the *Journal*, and librarian, to the Chemical Society, having been appointed to the former in 1850, and to the latter in 1861. He was elected a Fellow of the Chemical Society in 1847, a Fellow of the Royal Society in 1866, and a member of the Physical Society in 1879. He was also an Honorary Member of the Pharmaceutical Society, and a Life Governor of University College.

He was engaged at the time of his death in writing a new and abridged edition of the "Dictionary of Chemistry"; he was also editing, in conjunction with Mr. C. E. Groves, a re-issue of "Knapp's Technology," and the thirteenth edition of "Fownes's Manual of Chemistry," of which the second volume is left in manuscript.

GEOLOGY AT THE BRITISH ASSOCIATION

THE arrangements for the Geological Section of the British Association are now well advanced, and some idea may be formed of the amount of work likely to be done. Several meetings of the Organising Committee have been held in London, at some of which Principal Dawson has been present. From the list of members of the Association to whom vouchers for the meeting have been issued we learn that English geology will be represented at Montreal by six professors—those of Edinburgh; Trinity College, Dublin; University College, London; Victoria University, Manchester; and University College, Nottingham; and by Prof. T. R. Jones. The Geological Society sends sixty of its Fellows, including the President, Secretary, and six other Members of Council. Many of the leading geologists of Canada also are Fellows of that Society. The Geological Survey sends six of its members, and six or more who have at one time been on the staff.

The President of the Section is Mr. W. T. Blanford, Secretary of the Geological Society, who will afterwards represent that Society at the Philadelphia meeting of the American Association; the Vice-Presidents are Prof. T.