

was unfounded. The great argument advanced against the use of graphic illustration has been that students would imagine that it was intended to convey the positions of the atoms in space, and their linking or binding to each other; but in practice this has not been found to be the case. As soon, however, as the pupils have become thoroughly familiar and conversant with the use of symbolic constitutional formulæ, there is less necessity for the use of graphic formulæ, except, perhaps, in the case of complex isomeric organic bodies.

The theory of the atomicity of chemical elements is also used throughout the book, and the author states that he has found it to be remarkably conducive to the quick and thorough understanding of chemical changes. This theory is without doubt of great use in assisting the mind to generalise and grasp the numerous reactions of the elementary bodies, and by thus introducing this theory we are enabled to systematise to some extent the study of chemistry, and therefore to materially aid the memory.

The illustrations are numerous and well executed, and in almost all instances give a very good idea of the kind of apparatus, which should be employed in the various experiments. In conclusion we think that if a student were to work conscientiously through this book he will secure a fair knowledge of elementary inorganic chemistry, which will serve as a suitable groundwork for him on which to found an extensive knowledge of this subject. We therefore cordially recommend this work to the notice of all teachers of practical chemistry.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.]

Periodicity of Rainfall

THE remark of Mr. G. J. Symons in *NATURE*, December 26, that it seems to him "more likely that the effect of cyclone is simply to alter the locality of deposition" of rain, suggests a doubt whether the relation between rain and wind is sufficiently considered. The amount of evaporation must always be the chief element in the question of rainfall, and the total evaporation of any period must be much affected by the amount of wind. Evaporation may go on rapidly in still air, but it is almost necessarily increased if the air is moving. Storms over the sea not only bring moving air over a wet surface, but they also very largely increase the area of that surface by creating waves and foam. The evaporation during a cyclone may be presumed to be enormous. Wind in fact is almost always drying, even when rain is falling.

May we not on this account see a theoretical probability in favour of Mr. Lockyer's belief that the cycle of sun-spots coincides with that of rainfall?

If the solar spots indicate inequalities of temperature, the sun's heat when they are numerous will be radiated in bundles of rays of unequal power. These we may suppose, being directly incident on different portions of the earth, will cause special barometric differences here. The result will be special winds, and therefore special evaporation; followed by unusual rainfall. The locality of this extra rainfall will of course depend on other causes, partly on the direction of the special winds, and if it should be thrown on polar regions, or any other part of the earth where it escapes observation, there will be an apparent failure in the cycle. This also seems not inconsistent with experience as far as it goes

ALBERT J. MOTT

Athenæum, Liverpool, Dec. 31, 1872

Eleven-Year Rainfall Period

THE Royal Exchange storm of Nov., 1838, happened twenty-two years before Prof. C. P. Smyth's Hyperborean one of Oct., 1860—twelve years ago. I have heard of a great one at Dantzic

in 1816-17 (also twenty-two years before 1838). In a small book—"Chronological Tablets," published 1801, article on "Storms," great ones, in 1794, Oct. 6; 1784, Dec. 5; 1773, March; 1751, Dec.; 1740, Nov. 1; 1703, Nov. 26 (the Great Storm, vide "City Remembrancer," also *Nautical Magazine*, Jan., 1843, my extracts), this is not in the eleven-year series; 1658, Sept. (death day of Oliver Cromwell, fifty-five years before great 1703 storm), &c.

Now as the sun and moon are probably prime agents in these periodic hurricanes, we get $11 \times 365\frac{1}{4} = 4017\frac{1}{2}$ days, being 156 periods of 25d. 18h.; 147 periods of 27d. 7h. 7m.; and 136 periods of 29d. 12h. 43m., nearly.

Hyp. log. $\pi = 1.1447300 = \frac{7.11.223}{15} = \frac{17171}{15}$ very nearly.
 Offord Road, N., Dec. 16 S. M. DRACH

Pollen-eaters

FROM a note in *NATURE*, Dec. 19, it appears that it has hitherto been a mooted question among entomologists whether any species of Diptera are pollen-eaters. I have often watched certain slender-bodied flies, belonging to or allied to the family of Noveres (*Syrphidae*), in the act of feeding on the pollen of various flowers, which they effected by a quick jerking and grinding movement of the mandibulæ. I once witnessed the exhibition of a much more surprising taste by one of these insects, which, together with a small yellow ant, I watched for a considerable time feasting on a gout of resinous matter that had exuded from a wound in the bark of a spruce fir-tree.

Mention of ants reminds me of Mr. Meldola's statement (*NATURE*, vol. vi. p. 279) that Dr. Bree has pronounced their aphid-milking instinct a myth. While an undergraduate at Cambridge, I have more than once been a pleased spectator of this mythical performance; but Dr. Bree's incredulity may be explained by the fact that all ants have not this instinct. At least, though for many years constantly on the look-out for it, only one instance of it has come under my notice on this side of the Channel. On one occasion when I introduced an ant among a number of aphides, her first act was to seize one of them in her jaws; but after carrying it for a short distance over the backs of its fellows, she released it, and made what haste she could out of the company of creatures whose polite attentions she seemed by no means to appreciate.

Kilderry, Co. Donegal

W. E. HART

Fresh Water on the Coast of Tobago

WITH reference to my letter of the 11th ult. (*NATURE*, vol. vii. p. 124.) I forward the following further information with regard to the appearance of fresh water on the coast of Tobago, promised from the same correspondent.

"The appearance of foreign water on our southern coast in the months of August, September, and October, is by no means a rare thing. This water is always of a dark colour, emitting after a time a most offensive odour, and leaving on the beach a line of a frothy substance of a peculiar odour and yellowish green colour.

"The influx to which I called your attention surpassed anything of the kind ever seen here. I am not aware that anyone has tested this water, or preserved any portion of it. Mr. ——— had some brought to his bath for salt water, and thinking that his servant had played him false, he repaired to the bay, (Scarborough) and found the water there fresh instead of salt.

"There is much difference of opinion here as to the source of this water. Capt. ——— supports the views of those who hold that it comes from the Oronoko. To do this, that great river must force its flood 180 miles against the equatorial stream and trade wind, while the rivers to windward, e.g. the Demerara, Essequibo, &c., discharge their water into that stream, which impinges on our southern and eastern shores, leaving unmistakable evidence of its power.

"May not the Amazon have something to do with this phenomenon? It is said to send its waters 'pure and unmixed' into the ocean 300 miles. I have had no information as to excessive rains on the continent."

RAWSON W. RAWSON
 Government House, Barbados, Dec. 2, 1872

International Book Conveyance

THE benefits conferred upon science by the Smithsonian Institution are known to all your readers. The object of this note is