### Too many Decimal Places.

A COMMUNICATION in NATURE of January 26 (p. 294) ends with the sweeping suggestion "that, as a rule, only experimentalists are capable of judging the limits of accuracy of experiment, and that they may be trusted to save themselves trouble where trouble may be saved without sacrificing accuracy."

On the contrary, is it not true that experimenters, as a class, have shown a marked tendency to give unnecessary trouble, both to themselves and to those who utilize their results, by using too many significant figures in their numerical work? The strictures of mathematicians have done much to check this tendency. But can it yet be claimed that their habits need no critical inspection in this respect? Not being prepared to bring forward statistics, I can only make this remark in the form of a query, which applies to the general statement quoted, rather than to the merits of the special discussion which gave rise to it. In vol. lxi. (1871) of the Journal of the Franklin Institute, Prof. Pickering has shown by graphical methods how greatly Regnault's coefficients may be simplified. J. RAYNER EDMANDS.

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### "The Teaching of Elementary Chemistry."

IN NATURE of February 23 (p. 389), an anonymous correspondent, signing himself "Z.," draws attention to what he calls "a few highly misleading passages in the two books reviewed under the above heading in NATURE of January 19."

In the name of the authors of these books, I challenge "Z." to make good his statement that the passage which he quotes from p. 65 of the "Elementary Chemistry," concerning the reaction between sodium and water, is "highly misleading." We assert that the sentence is not misleading. The second statement quoted by "Z." is not quite correct: chlorine monoxide is prepared by passing dry chlorine over yellow mercuric oxide, which has been previously dried at 300°-400°, at the ordinary temperature, not over heated mercuric oxide, as stated on p. 116 of the "Elementary Chemistry." We thank "Z." for the correction. But, inasmuch as the result of passing chlorine over yellow mercuric oxide dried at about 100° is to evolve oxygen without forming chlorine monoxide, the correction does not affect the argument, and it may still be justly said that in making chlorine monoxide "we carry out a reaction in which oxygen is produced in presence of chlorine." The supposed contradiction found by "Z." between the directions given in the "Practical Chemistry" to the student who is burning a weighed quantity of magnesium—not to remove the lid of the crucible lest some of the magnesia should be "volatilized and lost"—and the statement in the "Elementary Chemistry," that "no compound of magnesium has been gasified," rests upon a verbal quibble. *Volatilized* and *gasified* have not precisely the same connotation. I confidently assert that no student is in danger of being misled by either of the statements which "Z." has quoted.

"Z." states that the results of an experiment on the reaction between potash and iodine, described on p. 63 of the "Practical Chemistry," contradict the sentence on p. 62 of the same book concerning the similarities between the chemical properties of chlorine, bromine, and iodine. I reply that "Z." has here shown himself to be unacquainted with the methods of chemical classification; and also that he has taken the word *similar* to mean the same as *identical*.

If "Z." will bring forward proofs that the statements he has quoted are "highly misleading," and will sign his name to the letter in which he states these proofs, I am ready to argue each point with him in detail. But, if "Z." continues to charge the authors of the books he has deigned to notice with making misleading statements, while he himself remains anonymous, I shall decline to take any notice of his communications.

Cambridge, February 29. M. M. PATTISON MUIR.

### The Gale of March 11.

I BEG to inclose the readings of my standard Robinson's cup-anemometer during the gale of March 11:—

| | | |
|---|---|---|
| 11–12 a.m., | 64 | miles. |
| 12– 1 p.m., | 67 | ,, |
| 1– 2 ,, | 71 | ,, |
| 2– 3 ,, | 73 | ,, |
| 3– 4 ,, | 63 | ,, |

General direction, S.W.; altitude, 600 feet above mean sea-level. C. E. PEEK.

Rousdon Observatory, Lyme Regis, March 13.

## THE DISPERSION OF SEEDS AND PLANTS.

IN a recent number of NATURE (vol. xxxv. p. 151) I mentioned instances which had come under my observation, in which birds had taken an active part in the dispersion of seeds and plants. Since then I have come across further notes bearing upon the subject which is one of considerable interest and importance, as it throws a direct light upon some at least of the agencies whereby plant life has been distributed over the surface of the globe. Although birds, from their greater adaptability to rapid and extensive locomotion, are more concerned than any other animals in the dispersion of plants, they are by no means alone in this work.

It may seem strange, at first sight, to assert that cattle have been the means of distributing the seeds of certain plants from one country to another, but a statement is made by Grisebach[1] respecting *Pithecolobium Saman* (N.O. Leguminosæ), a large tree native of Tropical America, now naturalized in Jamaica, that the "seeds were formerly brought over from the continent [of America] by cattle." This statement has been carefully examined, and it is fully borne out by facts. Formerly, Jamaica, like Trinidad at present, was dependent for cattle on Venezuela. The food of the animals during their voyage consisted amongst other things of the pulpy legumes of *Pithecolobium Saman*. The seeds being very hard were uninjured by the process of mastication and digestion, and they were dejected by the animals in the pastures, where they germinated and grew up into large trees. In this instance the seeds were carried across the sea a distance of about a thousand miles, and there is no doubt that the cattle were directly concerned in their introduction. Indeed, without them the seeds, even if accidentally introduced amongst the fodder, would not have been placed under such circumstances as would have enabled them to give rise to plants. In the first place, by being passed through the animals the seeds were softened and the period of germination hastened. In the second place, being embedded in the droppings of the animals the seeds had a suitable medium to protect and promote germination; and this medium enabled the young plants to withstand the season of drought which is incidental to almost every tropical country. In this instance we have cattle not only the means of introducing the seeds of a valuable tree, but also involuntarily instrumental in establishing the tree in a new country, and providing shelter, shade, and food for their progeny. Those acquainted with the guango or rain-tree, as this *Pithecolobium* is locally called, will fully realize its value as a shade and food-tree for cattle, and they will also appreciate the singular concourse of circumstances by means of which such a tree was introduced to a new country by the very animals which required it most.

It is possible there may be some who will doubt the possibility of seeds retaining the power of germination after undergoing the processes of mastication and digestion, and especially in the special case of ruminating animals. There is, however, very clear evidence on the subject. It is a common occurrence in India to utilize the services of goats to hasten the germination of the seeds of the common *Acacia arabica*, known as the babul. This tree belongs to the same natural order as the *Pithecolobium*, and grows in the poorest and driest soils of India. The babul seeds will not germinate readily in the hot weather, and it is the regular habit, in order to save a season, for a person desirous of a crop of seedlings to make a bargain with a herdsman or a neighbour who possesses a flock of goats to quarter them for some days in a small inclosure in which they are fed on babu leaves and pods. The droppings of the animals contain a certain number of seeds which are uninjured, and these now readily germinate, and give rise to plants the same

[1] "Flora, British West India Islands," p. 225.