yet of inertia, are—in this country, at any rate—already accustomed to pounds or ounces as the practical units of force. My suggestion is simply, "Don't swap horses while you are crossing the stream.

Dr. Lodge appears to object to my using the word inertia in the sense of the coefficient *m*. But he does exactly the same in his own book on "Mechanics" (p. 49); and the usage is, I think, quite common.

A. M. WORTHINGTON.

R.N.E. College, Devonport, January 26.

As a student and teacher of physics who has come much into contact with engineers and other artisans, I venture to say a few words on the vexed question of dynamical units now under discussion in your pages. It seems to me that it would be a distinctly retrograde step to adopt the proposals which Mr. Worthington makes in a recent number of NATURE. It would amount virtually to a return to the cumbrous and discredited system of units in use in British text-books of dynamics before the appearance of "Thomson and Tait," and the introduction of the Gaussian units of mass, force, &c.

It is certain that, whether the word "pound" be properly used to denote a unit of force or not, a common usage of the term is to denote a certain quantity of matter—that which has the same gravity at the same place as the so-called standard of weight. This is a standard quantity of matter and is a constant. Now in dynamics the primary property of matter is inertia, and inertia alone. When we compare the masses of bodies dynamically, we compare only their inertias; and that the forces of gravity on different bodies are proportional to their masses we have from Newton's pendulum experiment, &c. It seems natural and convenient, therefore, starting from this primary property of matter, to take the unit of mass as we find it defined, and give to that unit the unit of inertia. Then if the numeric of mass of a particle be *m*, of its acceleration dv/dt, the numeric of the inertia-reaction is $m \cdot dv/dt$ simply. The plan proposed by Mr. Worthington would introduce quite gratuitously the relation of his "unit of inertia" to the unit of mass, a relation which has been in the past—and would, I fear, be again—a great source of confusion to the student.

It is to be remembered, further, that the Gaussian system of units has been adopted by most civilized nations for practical electrical work. Certain units are constantly used in electrical engineering, which are simple multiples or submultiples of the various derived units in this system. It is too late in the day to change all this, and thereby run the risk of throwing things into the state of chaos from which with great labour and trouble they have been rescued. Hence the engineer, whatever units he uses for steam-pressures, &c., must, if he is taught dynamics at all, be taught how to express results given in gravitational units in terms of units independent of locality, or any other varying circumstance. It seems to me desirable, therefore, on the ground that the Gaussian system of units is in use in a great and growing department of engineering, to adopt it in our teaching at the outset. The true relations of other units is then got at once, and unfailingly.

My experience as a student and as a teacher is all in favour of the system and nomenclature followed by the persons whom Prof. Greenhill (I think) called "precisionists." Words are, of course, used in more senses than one in popular language; but if a popular word, such as "pound" or "weight," is to be adopted for scientific use, a restriction of its meaning to one sense is absolutely necessary if confusion is not to result. This, at any rate, is the principle on which scientific nomenclature has proceeded hitherto. This precision in the use of terms is absolutely necessary in teaching, and confusion of thought cannot be avoided without it. Of course there is want of consistency—no teacher can be perfectly precise; but that is hardly an argument for throwing precision overboard altogether.

Methods of teaching, after all, must stand or fall by their results, and I should like to join my testimony to that of those who say from experience that the Newtonian method in its original simplicity, with the system of units which Gauss gave, and which has produced so great and far-reaching scientific results, is the best way of approaching the study of dynamics. Students properly taught in this way have no difficulties beyond those inherent in a confessedly difficult subject.

ANDREW GRAY.

University College, Bangor, January 28.

Use of Sucker-Fishes in Fishing.

WITH reference to Mr. Sclater's note in NATURE of January 24 (p. 295), on the use of the *Remora* in fishing, I would like to call attention to the use of sucker-fishes by the aboriginal inhabitants of Cuba. Ferdinand Columbus ("Churchill's Voyages," 1704, vol. ii. p. 616) says these people used the sucker-fish to catch both other fish and turtles. These fishes when tied "by the tail run themselves against other fish, and by a certain roughness from the head to the middle of the back, they stick so fast to the next fish they meet, that, when the Indians perceive it, drawing their line, they draw them both together."

Lightcliffe, Yorkshire, January 26. H. LING ROTH.

Remarkable Rime and Mist.

THE extraordinary rime described by your correspondents was also experienced here (at 425 feet above sea-level) in January.

Though not an unusual occurrence in severe weather, this has never been equalled in my recollection.

The freezing fog lasted three days, each succeeding one appearing to add to the thickness of the rime, which culminated on the 6th, when it was difficult to believe that the trees were not covered with snow. On that date I measured one of the sheaves of spiculæ attached to a terminal shoot of a beech-tree, and found it very nearly 2½ inches in length. This, of course, was rather exceptional. E. BROWN.

Further Barton, Cirencester, February 1.

IT seemed to me scarcely necessary to mention the amount of what may be called, for the sake of brevity, "sooty matter," in the rime referred to by Mr. Maw (p. 295). Some of the products of combustion are frequently restored to the ground without contact with water particles; but many are carried about in the atmosphere for a considerable time, and are returned to the earth through aqueous precipitation. I am not sure that the subject of the varying results of analyses of rain-water, obtained under various conditions of weather, has received the amount of attention which it deserves. The heavy rains of our summer thunderstorms seem to contain less sooty matter than is brought down in drizzling rain, when we have made the necessary allowances for direction and force of wind, hygrometrical and thermal conditions, type and quantity of previous rainfall, &c. This is probably due to the fact that rain-drops of the thunderstorm fall from the greater altitude and fall more vertically through the lower strata of the atmosphere. I should, however, like to learn from some readers of NATURE whether the larger rain drops may not also, from the motion of air which they produce, treat some of the particles of sooty matter with the kindly neglect shown by them to the midges. Snow (as, I suppose, most people have observed by the sense of taste, without chemical analysis) contains, when melted, more sooty matter than rain, and I should have expected the inhabitants (including, of course, the tobacconists) of certain localities on our globe to feel rational gratitude to those slanting flakes which, in their voyage through our air, cleanse it of its sooty particles at those seasons when we are most fertile in producing the latter. But the drifting fogs which traverse a considerable area of land where there are factories, chimneys, &c. (their water-particles moving in lines nearly concentric with the earth's surface, and at no great height above it), should give the air a more thorough washing than is provided by the more common forms of precipitation. The ice-crystals produced by such fogs necessarily furnish, when melted, a maximum of sooty matter.

The letter from Mr. Lowe (p. 319) confirms what was anticipated, that the fog and rime were considerably less in the west of England than in the Midlands. It is perhaps contrary to the rules of good taste for me to criticize the words of so great an observer as Mr. Lowe, but is it not a contradiction of the laws which govern atmospheric phenomena, considering the great distance between true cirri and the fog described, to suppose that the upper surface of the latter "rapidly changed to cirri clouds"?

Speaking of mist, it is almost impossible not to refer to the very interesting article by Prof. J. H. Poynting, F.R.S. (p. 323). May it not be possible that the quivering so often seen in a summer haze is, after all, the result of evaporation, as Wordsworth, the poet of Nature, himself seems to have thought in his use of the word "steam," in "The Excursion."

ANNIE LEY.