meaning than a "triangular square," Martins divides his "*brouillards secs*" into four classes, viz. volcanic ashes as seen in the year 1783; smoke from turf or stubble fires; *callina* or *qobar*; and a fourth kind established on negative evidence which seems untrustworthy.

W. Clement Ley has described quite well the hues of *qobar*. It is light buff when near or slight. Otherwise, its colour is a lurid gray verging to blackness. Whatever may be its connection with cumuli in England, I could detect nothing of the sort in Ethiopia, where I have watched *qobar* for whole weeks without any ensuing rain or even cloud.

Four years ago the French transit of Venus expeditions agreed to investigate the amount of carbonic acid gas in the air of their several stations. Mine was in Hayti, where *qobar* was rife, and while observing for many consecutive hours the passage of air through caustic potash in prepared tubes, I regretted their not being made to receive plugs of loose cotton in order to collect smoke, dust, or microbes. All the tubes having been subsequently tested in Paris by Prof. Müntz, he obtained the unexpected result that air contains more carbonic acid in the southern hemisphere than on the north of the equator. Those tubes inclosed also fragments of pumice-stone previously steeped in sulphuric acid in order to collect moisture. With a little care and trouble next summer in a spot of Southern Europe where *qobar* abounds, meteorologists might soon get an insight into its true nature.

January 3. ANTOINE D'ABBADIE.

SEVERAL communications have appeared in NATURE on the subject of atmospheric haze. It would be interesting to know whether the writers consider the haze which they have described as identical in substance with that which I would call *ordinary* atmospheric haze. The haze of these writers is a haze taking the visible form of layers or bands. The haze to which I refer has under ordinary circumstances no visible form at all. We are conscious of its presence by its effect in diminishing the transparency of the air. Everyone knows that, quite apart from fog, or smoke, or dust, or low cloud, or falling rain, the transparency of the air varies very greatly at different times. In our climate there is nearly always more or less of atmospheric haze, the rare exceptions proving the rule; and the haze may be so dense as to render terrestrial objects invisible at a distance of a very few miles. Celestial objects may also be obscured by the same cause. Not to speak of the varying brightness and varying colour of the sun at sunset (in the production of which effects another cause may co-operate), there are occasions on which the sun long before sunset is shorn of his beams through the intervention of a low general haze, the hygrometric conditions at the time being such as to preclude the idea of fog, to which indeed the haze referred to bears little resemblance.

On July 24, 1868, I witnessed from the summit of Snowdon a curious effect of this diffused haze. The day was cloudless. Overhead the sky was clear and blue, but at lower altitudes it was hazy, and the haze gradually thickened towards the horizon, where it terminated in an opaque brown ring, which encircled the mountain and shut out from view all objects beyond a distance of about 15 miles.

The nature of atmospheric haze has not, I think, hitherto been satisfactorily elucidated, and it is much to be desired that advantage should be taken of some occasion when the haze is exceptionally dense, for the application of the various methods of research which modern science has rendered possible.

Clifton, December 25, 1888. GEORGE F. BURDER.

On the Use of the Words "Mass" and "Inertia"—a Suggestion.

As a teacher of dynamics to Engineer Students, I followed with interest the discussions in NATURE, as to the use of dynamical terms, that have taken place within the last two years, and have recently re-read the whole correspondence with care. Two points seem to me to have been not quite sufficiently brought out.

(1) Physicists and teachers of dynamics, however careful they may desire to be, use the word "mass" in two senses: (1) in the old, non-scientific, (Johnsonian) sense of a "lump of matter," and (2) in the precise scientific sense of the "inertia" of a lump of matter. Indeed, I suppose that no scientific man would hesitate to speak of "the inertia of a mass of matter."

The phrase "attracting mass" is universal among scientific men, when attracting "lump" would do just as well. Thus, in Prof. MacGregor's very carefully written "Kinematics and Dynamics," we find, in Art. 290, "mass" carefully defined (in the sense of inertia) as the value of a certain ratio, and in the next article the use of the word in the sense of quantity of matter is deprecated; yet, in Art. 355, we have "attracting mass" where attracting "inertia" would not do, followed, a few lines further on, by "a particle of unit mass" where "unit inertia" would serve as well.

It is this double use of the word that, I think, sometimes escapes Engineers.

Each of the words "mass" and "weight" is used in two senses, one of which is common to both, but the other not. The fact confirms very strikingly Prof. Greenhill's contention that the scientific man is unwise to attempt to limit for his own purposes the signification of a word already well established in the language. For it shows that he cannot even keep straight himself. I think myself that the scientific man ought to back out with as much grace and celerity as may be, and determine for the future to say "inertia" when he means "inertia," and to use for its numerical representation the symbol "*i*" (or perhaps "*s*"—sluggishness) rather than the symbol "*m*." The symbol "I" might still be used for *moment of inertia*. Such an expression as a "mass of 20 pounds" would still mean exactly what it does at present, and nothing already written would be affected by the change.

(2) The second point that I have to mention is purely a question of procedure in teaching.

The whole subject of dynamics might well be termed the study of the inertia (the "sluggishness") of matter. This is the one new property whose existence, signification, and measurement has to be brought home to the student. Now, I would urge that it does not seem reasonable to ask the student simultaneously to comprehend a new property of matter and to alter his unit of force by defining it with reference to the new property. Do what we will, our students before they begin to learn dynamics will be familiar with the notion of "force" as a "push" or a "pull," and measured in terms of "pounds" and "ounces."

I think it would be far the best plan to define the British unit of force as the weight *in London* of the standard pound lump, and the unit of inertia as that of the mass or lump on which this force generates the unit acceleration of 1 foot-per-second per second.

Thus the unit of inertia would be that of 32·1912 standard pounds, the number 32·1912 being, for brevity, throughout the teaching, written "*g*."

This would be to adopt with careful definition, by which it is rendered perfectly precise, the Engineers' unit of inertia for purposes of instruction in dynamics. It means empoying a *force-time-length* system of units instead of an *inertia-time-length* system.

Such a system would be in harmony with the order of our experiences and of our ideas as we grow in intellectual stature, and with the history of human thought as written in our language, and it is unwise to wage war with our own past even under the encouraging leadership of your correspondent "P. G. T."

Perhaps I may be allowed here to deprecate the somewhat misleading effort now being made by some chemists and physicists to substitute the word "mass" for "weight" where no question of inertia is involved or dreamt of, as, for instance, in the definition of specific heat, by reference to equal masses, instead of equal weights, as if the idea of quantity of matter had not been attained quite independently of the conception of inertia, and were not in the case in question always determined by weighing. A. M. WORTHINGTON.

Royal Naval Engineer College, Devonport,
December 30, 1888.

Eight True Ribs in Man.

IN the number of NATURE which appeared on November 1, 1888, there is a notice to the effect that "at one of the meetings of the Anatomical Society, during the session of the Medical Congress in Washington, Dr. Lamb, of the United States Army Medical Museum, spoke briefly of a singular phenomenon he had observed in his examination of human breast-bones. It was the occurrence, in a number of specimens, of an eighth rib,