

## CORRESPONDENCE.

To the Editor of the *Mathematical Gazette*.

SIR,—The very interesting and helpful Report on *The Teaching of Mechanics in Schools*, recently issued by the Mathematical Association, is, unfortunately, disappointing in the sections which deal with mass and weight. There will always be confusion, not only in the minds of beginners but even I imagine in the practice of engineers, so long as the two senses of the word “pound” are admitted. The committee says that it cannot be helped, but surely it is the duty of the teacher to present ideas clearly and give the budding mechanic a fair start.

It seems essential that the word “pound” should never in any circumstances be used in the sense of weight. A pound is a lump of matter whose weight is a poundweight (lbwt., not lb.wt.). This is the practical unit of the British engineer, crude and unscientific and lacking in constancy like the nautical mile, but eminently useful. The “absolute” unit, the “poundal” (lbf.), can only be introduced with dynamics and the idea of mass, and is  $\text{lb.} \times \text{ft.} \times \text{sec.}^{-2}$ .

It is essential also, in order to avoid the common confusion, that “ $g$ ” should be used invariably for an acceleration, not a number. To say that the weight of a pound is  $g$  poundals is confusion worse confounded. After mass has been explained, it is correct to say that a mass  $m$  has a weight  $mg$ , but certainly not  $mg$  poundals; we may also say that a mass  $m$  lb. has a weight approx.  $32m$  lbf., or a mass  $m$  gm. a weight approx.  $980m$  dynes, but not  $mg$  dynes.

It is very desirable also that the term “foot-pound” of the engineer should be replaced by “foot-poundweight”, or at least that the contraction ft.lbwt. should invariably be used, and never “ft.lb.”, for the unit of work; for “ft.lb.” is not work but distance  $\times$  mass. If the phrase “foot-pound” is considered too deep-rooted to be displaced, at least we may contract it to ft.-lb. and not ft.lb. which means  $\text{ft.} \times \text{lb.}$ . The same objection applies to the new term “second-pound” for unit of impulse, which should be sec.lbwt. (not sec.lb.wt.).

To the purist also the term “horse-power” is commonly misused. Horse-power is the unit of power. It is really just as grotesque to say “the horse-power of an engine is 7” instead of “the power of an engine is 7 HP” as it would be to say “the pound-weight of a load is 20” instead of “the weight of a load is 20 lbwt.”.

Are these not matters in which a teacher can exercise a reforming influence?  
Wellington, N.Z., 15th Sept. 1930. D. M. Y. SOMMERVILLE.

Professor Sommerville’s plea that the word “pound” should be used in one sense only is at first sight the only logical method of attempting to get rid of an admitted source of confusion.

But on careful consideration (and I can assure Professor Sommerville that the M.A. Committee gave this and the connected questions the most lengthy, careful and I may add at times heated consideration) this seemingly obvious course appears to leave out of account human nature and the way in which language grows up.

It is usage which settles the meanings of words and usage is against the proposal. It is human nature to resent dictation as to ordinary modes of speech from an academic body, and committees who wish their reports to influence teaching must try to avoid raising resentment.

After all, words used in more than one sense are fairly common in Mathematics and extraordinarily so in non-mathematical English.

What would be thought of a report on Geometry which said “The word

*pole* must never be used by itself; it must always be 'pole of a certain line with respect to a certain conic', and this is the only possible use of the word *pole*"; or of a treatise on English grammar which said "It is legitimate to speak of a *row* of houses or a *row* of men, and the word *row* must on no account be used in any other sense"?

These instances may indicate some of the reasons why in this question the Committee decided that "the better part of valour is discretion".

C. O. TUCKEY.

### THE PILLORY.

"In areal co-ordinates, if the equation  $(lx)^{1/2} + (my)^{1/2} + (nz)^{1/2} = 0$  represents a central conic, prove that the centre is  $(m+n, n+l, l+m)$ .

If, however, the equation represents a parabola, prove that  $l+m+n=0$  and that the line  $lx+my+nz=0$  is parallel to the axis."—Examination for Entrance Scholarships, St. Catherine's College, Cambridge, Jan. 1929.

[If  $(m+n, n+l, l+m)$  is on the line at infinity, whose equation is

$$x+y+z=0,$$

then  $l+m+n=0$ ; the coordinates can be replaced by  $(l, m, n)$ , and the point  $(l, m, n)$  does not lie on the suggested line unless  $l^2+m^2+n^2=0$ ! The simplest line through  $(l, m, n)$  is

$$(m-n)x + (n-l)y + (l-m)z = 0,$$

but this is a diameter in every case, not merely in the case of the parabola.

If the conic is a parabola, the focus is  $(a^2/l, b^2/m, c^2/n)$ , and the equation of the axis is, actually,

$$\frac{x}{l} \left( \frac{b^2}{m^2} - \frac{c^2}{n^2} \right) + \frac{y}{m} \left( \frac{c^2}{n^2} - \frac{a^2}{l^2} \right) + \frac{z}{n} \left( \frac{a^2}{l^2} - \frac{b^2}{m^2} \right) = 0. \quad \text{H. E. P.]}$$

### AN EXPLANATION.

MRS. GREENSTREET asks us to say, with reference to a phrase in the October *Gazette* that has been misunderstood, that she was appointed to the Marling School as matron immediately on leaving the hospital in which she qualified. She held no other position at Stroud, nor was she attached to the headmaster's family at any time in any professional capacity whatever. Dr. Macaulay explains that what he wished to recall was that Miss Teal, as she then was, was always addressed both in the school and in the family by the warm appreciative title of nurse, not by the emotionless title which was her official due.

### A MEMENTO OF MR. GREENSTREET.

The articles on Mr. Greenstreet which occupied the first six pages of the October *Gazette* have been reprinted with a photograph; this memento is to be obtained from Mr. Pendlebury at the price of 6d., postage included.

### AN OFFER.

The Association has for disposal several runs of the *Gazette*, vols. 3-10, complete in parts as issued except for the Title-page and Index to vol. 3. These are offered at six guineas a set, carriage paid (in U.K.). It must be understood that the missing Title-page and Index can not be supplied separately at any price, and that vols. 1-2 are not available to supplement these sets.

Applications should be made to the Librarian, who will also answer enquiries as to complete sets.