quired ten minutes of time, and if we had exact measurements of angles and times we should undoubtedly from these curves be able to deduce the rate of rotation of the meteor, and possibly its mass.

Most of the aerolites that come to the earth show, by their pitted surfaces, that the meteoric material is being split off or ejected quite uniformly from the whole surface; but some meteors, like some comets, may have only a very few regions on the surface from which material is ejected with any special force. In Mr. Davis's meteor of October 13 we seem to have a case in which some one spot on the side of the meteor, namely somewhere between its head and its tail, ejected its material freely and with considerable force, in a direction at right angles to the axis of rotation, or the line joining head and tail: it represents the rare case of a symmetrical revolving meteor.

CLEVELAND ABBE.

WASHINGTON, D. C.,
August 15, 1906.

SOME 'DEFINITIONS' OF THE DYNE.

IT would seem comparatively easy for any one whose mind has dwelt comprehendingly upon the relation $F = ma$ to define correctly the unit of force in terms of mass and acceleration. But such is evidently not the case. Of the text-books of physics immediately at hand, four give incorrect definitions of the dyne. In each case the author is a man of high and wide reputation as a writer and teacher. In quoting the definitions in question, I have taken the liberty of italicizing the words to be omitted with advantage.

(*a*) Force: dyne. 1 g. given unit acceleration *in 1 sec.*

(*b*) The practical unit of force is the dyne. * * * It produces unit acceleration of unit mass *in unit time.*

(*c*) The absolute unit of force (in the C. G. S. system) is called a dyne, and is that force which *in one second* is capable of giving to a gram-mass an acceleration of one centimeter per second.

(*d*) The absolute unit of force is the force that, acting *for unit of time* upon unit of mass, will produce unit of acceleration. * * * The centimeter-gram-second (C. G. S.) unit of force is the force that, acting *for one second* upon a mass of one gram, produces an acceleration of one centimeter per second. It is called a dyne.

The first two books are intended for universities and colleges, the latter two for preparatory schools, and all four, I believe, have been widely used.

It is perhaps proper to state that each of these authors gives a correct definition in terms of mass, time and change of velocity, but each seems implicitly to ignore the fact that acceleration is not change of velocity, but is *rate* of change of velocity. To conclude, the dyne is the force that, acting on a mass of one gram, gives to it C. G. S. unit acceleration (for which there is no name), irrespective of the time during which the force acts upon the mass, whether it be the millionth part of one second, or one million eons. $F = ma$, and when $m = 1$, and $a = 1$, then $F = 1$.

Similar errors are of course committed in defining the poundal. The text from which the quotation (*d*) above is taken gives:

> The foot-pound-second (F. P. S.) unit of force is the force that, applied to one pound of matter *for one second,* will produce an acceleration of one foot per second. It is called a poundal.

And a fifth book, also for preparatory schools, states:

> In the F. P. S. system the unit is the poundal, which is the force that on being applied to 1 lb. of matter *for 1 sec.* will give to it an acceleration of 1 ft.

In this last case, the same mistake is made in the general definition of the absolute unit of force, but the dyne, specifically, escapes with a defective definition in terms of mass, time and change of velocity.

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SPECIAL ARTICLES.

A PECULIAR MUTATION OF THE PINE MARTEN.

A TRAPPER'S skin, without skull, of a pine marten (*Mustela americana actuosa* Osgood) recently offered for sale to the National Museum by Mr. James Aitchison, Nulato, Alaska,