literature of that subject by Dr. Charles A. Goessmann, at the present time Director of the Massachusetts Agricultural Experiment Station, but formerly, from 1861 to 1869, chemist to the Onondaga Salt Company, at Syracuse, N.Y. While filling that position he investigated very thoroughly the salt deposits of New York, Michigan, Goderich, Canada, and Petit Anse Island, Louisiana, and his published reports and memoirs (some twenty in number) upon the salines, brines, and mineral springs of the country form, for the period which they cover, a very complete and valuable record of the salt industry in the United States.

Amherst, Mass., May 26. F. TUCKERMAN.

Prof. Greenhill on "Kinematics and Dynamics."

MAY I ask space for a few short comments on Prof. Greenhill's letter in your issue of May 17 (p. 54), so far as it is directed against myself.

(1) The "circumlocutions" referred to are not of my devising, but are current phrases which involve no ambiguity and are useful for avoiding frequent repetition.

(2) It is not true that "although such words as 'a force equal to the weight of the mass of 10 pound weights' do not occur in Prof. MacGregor's book, they are strictly derived from his definitions." According to my definitions, it is the body itself which has weight, not its mass; and the above phrase is therefore meaningless.

(3) Prof. Greenhill has not cited a single instance to justify his charge that I am at variance with my own definition of the weight of a body in the majority of the subsequent examples.

(4) He now seems to admit that in my hydrostatical equations pressure may be expressed in pounds on the square foot, but to claim that it can be done only in a clumsy manner. There is doubtless a certain clumsiness, but it seems to me to be due to the employment of a clumsy set of units.

(5) Your reviewer still demands that I should give the dimensions of the earth, not in terms of the actual metre, but in terms of what the original designers of the metre intended it to be; but he gives no reason for this strange demand.

(6) If the knot is a unit of velocity, the term *knots per hour* is of course redundant. I have always considered it an abbreviation, but have no means at hand of settling the point.

(7) Prof. Greenhill tacitly admits that he was in error in accusing me of misusing the term *elongation*.

(8) He makes no attempt to substantiate his statement that my equations of energy were not expressed in proper form.

(9) He does not answer my question as to which of the most recent treatises on dynamics my treatment of units shows me to have read without profit and discrimination.

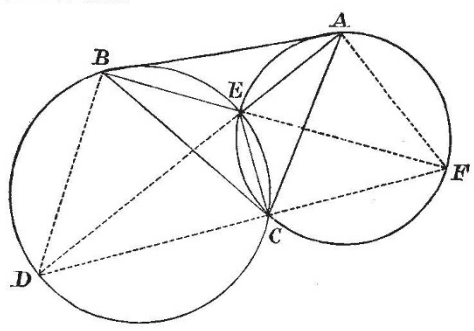
Edinburgh, May 31. J. G. MACGREGOR.

Further Use of Ptolemy's Theorem (Euclid, VI. D.) for a Problem in Maxima and Minima.

To find E within ΔABC such that

$$AE \sin BEC + BE \sin CEA + CE \sin AEB$$

shall be a maximum.



Keep BEC constant; produce AE to cut circum-circle of BEC (which is then a fixed circle) in D.

Then $\sin BEA = \sin BED = \sin BCD$,
$\sin AEC = \sin CED = \sin CBD$,
and $\sin BEC = \sin BDC$;

$$\therefore \frac{BC}{\sin BEC} = \frac{CD}{\sin AEC} = \frac{DB}{\sin AEB};$$

$$\therefore AE \sin BEC + BE \sin CEA + CE \sin AEB$$

is proportional to

$$AE \cdot BC + BE \cdot CD + CE \cdot BD,$$

and therefore to

$$AE \cdot BC + ED \cdot BC. \quad \text{(Eu. VI. D)},$$

which

$$= AD \cdot BC.$$

For a maximum AE passes through centre of circum-circle of BEC.

Similarly BE passes through centre of circum-circle of CEA. Let it cut it again in F.

$$\angle BCE = \angle BDE,$$
$$= \angle BFA \text{ in same segment of circle through F, A, B, D,}$$
$$= \angle ACE.$$

Similarly

AE, BE bisect $\angle CAB$, ABC.
$\therefore$ E is the in-centre of ΔABC.

Bedford. E. M. LANGLEY.

Davis's "Biology."

IF I may argue from the contents of Mr. Davis's book, he should be a good judge of what constitutes "falling into a common mistake," and yet I cannot accept his opinion as to my having accomplished this feat. I have refrained from enumerating the common mistakes which his little book contains, but I am not prepared to allow him to lay down the law as to educational methods. In my opinion it is a grievous error to present any subject of study to University students under two aspects, that of "pass" and that of "honours." Whatever is worth doing at all (in academic exercises) is worth doing well, and no regulations sanctioned by any University Senate—however philanthropic, incompetent, and imperial—can make the perennial iteration of the statements in a cram-book concerning six plants and six animals a satisfactory substitute for the study of zoological and botanical science, or anything but a pernicious torturing of the youthful mind. THE REVIEWER.

M. FAYE'S THEORY OF STORMS.[1]

ACCORDING to M. Faye, "There exist in meteorology two theories diametrically opposed—one which considers air-whirls round a vertical axis, including cyclones, typhoons, tornadoes, and waterspouts, to originate in the upper currents of the atmosphere; and the other which considers each of these as the effect of a local rarefaction, giving rise at the surface of the ground, in an atmosphere in a more or less unstable condition, to an ascending current of air, which borrows a gyratory tendency from the rotation of the ground itself." Such is the opening sentence of the pamphlet before us, which embodies a *résumé* of M. Faye's discussions in the French Academy with those who do not accept his peculiar views on the generation of atmospheric disturbances.

M. Faye upholds the former theory with that incisive vigour which characterizes our Gallic neighbours, and attacks the meteorologists with whose writings he is acquainted, beginning with poor Franklin and ending with Sprung in 1885, without mercy, but at the same time without the smallest reference to physics apart from mechanics.

Before pointing out some of the grave errors of fact, as well as theory, into which we deem M. Faye to have fallen, it may be as well to see if we cannot attempt a reconciliation between these two opposite views, which are considered to be prevalent.

To avoid mixing up tornadoes and cyclones, which we hold to be, if not generically, at all events specifically, distinct, let us first consider the former alone. The point

[1] "Sur les Tempêtes." Par M. H. Faye. (Paris: Gauthier-Villars, 1887.)