

Plane Geometry. By JOHN H. WILLIAMS and KENNETH P. WILLIAMS. Chicago, Lyons and Carnahan, 1915.

THIS text in my estimation is an excellent example of what a plane geometry book should not be. It starts with a lot of formal definitions followed by demonstrative work. There are so many inaccurate and incorrect statements, definitions, and proofs that I think it undesirable to list them. I shall however state a few: "An exterior angle of a triangle is the angle formed by producing one side of the triangle"; "A triangle is defined as a polygon bounded by three straight lines," and twenty pages later we find the definition of a polygon. "The limit of a variable is a constant which the variable is supposed to approach in value and can be made to differ from it by an amount that is less than any assignable value, but can not be made absolutely equal to it."

F. M. MORGAN.

Theories of Energy. By HORACE PERRY. New York, G. P. Putnam's Sons, 1918. vii + 231 pp.

THE title of this book is as misleading as the results are unsatisfactory. The author does not consider "theories of energy," but advances a theory of energy due to his own reading and reflection. The plural character is due to the fact that he considers as theories: theory of energial propagation, theory of the energetic atom, theory of spectral lines, theory of gravity, theory of color, etc. The unsatisfactory character lies in both the results of his reflections and the gaps in his theory.

In the first place (and to endeavor to point out the very long entire list of features of his explanation of energy would be tedious and unprofitable) we need to notice his idea of matter. He begins on the first page with the assertion that "All space is filled with matter, and in the infiniteness of space there is no vacuity anywhere, not even of the extent of an atom's size, and the universe, embracing all the matter in existence, is continuous throughout." This idea that the entirety of space is filled with a continuous material medium was new when Thomson's vortex atom was at its best, but is far in the past at present. Perry's ether is perfectly continuous in all space, but as it has no cohesion between its parts, there is "merely a togetherness without any forcible hold." It is a "perfect fluid with perfect passability."

This ether is subject to condensations and rarefactions, which are propagated in all directions. The character of the wave thus produced seems not to enter his calculations.

Matter is continuous. In fact the electron is not anywhere mentioned in the theory he advances. It is endowed with energy in the form of heat and chemical energy. The radioactive disintegration is merely the chipping at the surface of the atom due to the motion of the internal energy. Energy is then defined to be the internal action of the atom, all energy being *densitic* in character, which means it consists of condensation or rarefaction waves. The wave frequency differentiates the various forms of energy. Gravity on this scheme is of a single frequency.

Magnetism is energy generated in the centers of the iron atoms, being "the natural energy of the iron, modified by the substance with which the iron is combined in molecules, and augmented through a certain method of reciprocal energization." The remaining definitions may be passed over. The author seems to be familiar with a number of antiquated textbooks of a college grade, and somewhat with modern phenomena. From these he has attempted to build up an explanation of the very intricate laws and phenomena of the whole of physics. The result is what would have been expected.

JAMES BYRNIE SHAW.

NOTES.

THE April number (volume 20, number 2) of the *Transactions of the American Mathematical Society* contains the following papers: "Memoir on the general theory of surfaces and rectilinear congruences," by G. M. GREEN; "Modular concomitant scales, with a fundamental system of formal covariants, modulo 3, of the binary quadratic," by O. E. GLENN; "Concerning a set of postulates for plane analysis situs," by R. L. MOORE; "On the limit functions of sequences of continuous functions converging relatively uniformly," by E. W. CHITTENDEN.

AT the meeting of the National Academy of Sciences held at Washington April 28-30, Professors OSWALD VEBLEN, E. J.