the theorem employed by Professor Huntington involves a physical principle not explicitly stated by him, namely that *matter consists of individual particles, each of which preserves its identity and its mass throughout all physical or chemical changes.*

Those who believe that mechanics should be regarded as a physical science rather than a branch of pure mathematics will probably agree that in elementary instruction it is less important to build up a logical framework than to help the beginner to appreciate the physical meaning of dynamical laws.

L. M. Hoskins

Stanford University,
September 16, 1916

FLASHING OF FIREFLIES

To the Editor of Science: The notes by Mr. Edward S. Morse in Science for February 4 and September 15, 1916, on fireflies flashing in unison, have been of very great interest to the writer, in connection with his studies of the light-emission of American Lampyridæ,[1] and during the course of these observations he has constantly been on the watch for synchronous flashing of the type reported by Mr. Blair and by Mr. Morse. There seems to be no doubt that it is a fairly frequent, if not a constant, method of light-emission among certain tropical (mainly oriental) Lampyrids, but instances of it in our North American species must be fortuitous, at least in this locality. The writer's observations so far made have been on *Pyractomena borealis, P. lucifera, P. angulata, Photinus pyralis, P. consanguineus, P. scintillans, P. marginellus, P. castus* and *Photuris pennsylvanica.* In most of these there is now no doubt that the photogenic function serves as an attraction between the sexes for mating, and synchronous flashing of a large number of individuals would seem to be of such a nature as to interfere with this function of the light. Among the species studied, there would appear to be a possibility of anything approaching synchronous flashing only in *Photuris pennsylvania,* whose lighting habits it has been found difficult to follow accurately. On one or two occasions during the past summer observations were made by Mr. H. S. Barber, of the National Museum, and the writer, of what appeared to be the alternate illumination of adjacent trees in which this species was present in abundance, but it was soon evident that while at a given instant one tree may have been more highly illuminated than the other, there was nothing approaching periodicity in the phenomenon, and no continuation of it was noticed. Of course, special conditions of temperature, moisture, air currents, etc., might influence these insects in such a way as to produce synchronous flashing, but although especially watched for, we have been unable to secure an observation of it. If any other observations of this character have been made on North American species of Lampyrids, the writer would be very glad to hear of them.

In regard to the synchronous head movements of ants, referred to by Mr. Morse as having been reported by Cox, it may be noted that one of our common web-worms exhibits a very similar conduct, a stimulus, such as a shadow passing over the colony, being sufficient to cause all of the caterpillars to jerk the head and forward segments from side to side, the great majority of them to the same side at the same time.

F. Alex. McDermott

Washington, D. C.,
September 20, 1916

[1] *Canadian Entomologist,* 1910, Vol. 42, p. 357; 1911, Vol. 43, p. 399; 1912, Vol. 44, pp. 73, 309; *Zeitschrift fuer wissenschaftliche Insektenbiologie,* 1914, Vol. 10, p. 303.

OCCURRENCE OF YELLOW LEAF RUST OF WHEAT (PUCCINIA GLUMARUM) IN THE SALT LAKE VALLEY, UTAH

On June 23, 1915, the writer and one of his assistants, Mr. W. W. Jones, collected an apparently new rust on wheat in several fields north and west of Ogden, Utah. It was noted that the infection was very serious and in some instances the fields had the appearance of suffering greatly from drouth. A careful examination, however, showed that this condi-