vibration which is reflected in the body. . . . The Greeks and Romans also knew of the power of words in this respect."

The music of any people is more than their melodies. It preserves many beliefs and customs that would otherwise be lost. In this lies the field of cooperation between the study of primitive music and other branches of ethnology.

FRANCES DENSMORE

RED WING, MINNESOTA

A METHOD OF ESTIMATING POST-GLACIAL TIME

AMONG the problems met in the study of the Post-Pleistocene is one concerning the time period involved. The solution of the problem is important in many ways. Geologists are more keenly aware of the events which have occurred in this period than in any other. Hence close estimates of the length of time involved will contribute to a more accurate geological conception of the absolute rapidity of various physiographic processes.

Several estimates of the length of post-glacial time are commonly known. Taylor,[1] following Lyell, Spencer and others, estimated the period occupied on the recession of Niagara Falls. DeGeer[2] reached his conclusions from his studies of varied clays. Other estimates have been based on the erosion of the pedestals beneath erratics and on the comparative weathering of drift materials of different ages. The variation in these estimates emphasizes the importance of additional methods of calculating the Post-Pleistocene time interval.

At Yellow Springs, Ohio, there is located a chalybeate spring which has built at its point of issuance in the Cedarville (Niagaran) limestone a large mound of ferriferous travertine which extends some hundred yards into the Yellow Springs Creek valley. The valley lies nearly north and south and is located within the most extended moraines of the Wisconsin glaciation; not, however, within the terminal moraines of the last Wisconsin invasion. The ice moved from a northwesterly direction; the deposit is located on the east side of the valley—hence, it is reasonable to suppose that any preglacial deposit would have been removed by ice abrasion. The erosion by the enlarged streams from the melting ice, one of which occupied the valley, undoubtedly aided in eliminating previous and contemporaneous travertine deposits.

[1] Taylor, F. B., Niagara Falls Folio, United States Geological Survey Folio, No. 190, 1913.

[2] DeGeer, Gerard, "A geochronology of the last 12,000 years," Cong. Int. Geol. Compte Rendu, XI, 1910, pp. 241–253, 1912.

Theoretically, the volume of the present deposit divided by the rate of accumulation should yield the length of time of accumulation as a quotient. The method, as will be readily recognized, involves several complex factors, chief of which are variations in spring flow and in amount of solid material deposited, each influenced in turn by rainfall, temperature and variations in the subsurface spring channels.

Accurate observations extended over a considerable period of rainfall, spring flow, air and water temperatures, together with studies of the differences in quantity of solids in solution at different points within the area of deposition, should provide a basis for a reasonable estimate of the present rate of deposition. A careful collection of the encrusted vegetation should provide an index of climatic variation, which in turn influenced the rate of deposition in the past.

A detailed instrumental survey of the bedrock structure has already revealed the presence of a small flexure, or possibly a fault, which undoubtedly explains the location of the spring and leads also to the conclusion that the spring has been relatively permanent.

The first estimates of the age of the Yellow Spring travertine mound must be regarded as purely tentative. The figures obtained, namely 20,000 to 30,000 years, are intermediate between those given by Taylor and DeGeer. Since trustworthy results of the study of the spring deposit must await the passing of some months, and possibly years, of observation it seemed worth while to publish this method of estimating post-glacial time. It is undoubtedly applicable to many similar travertine deposits. The study of a number of them, in various situations relative to morainal deposits, should contribute materially to the knowledge of the length of the Recent epoch.

A. C. SWINNERTON

ANTIOCH COLLEGE,
YELLOW SPRINGS, OHIO

LUMINESCENCE IN SPONGES

CASES of luminescence in sponges have several times been recorded. Noll (*Zool. Anz.*, 1879, p. 402) described luminescent larvae of *Reniera*, which had been reared in a table aquarium. The light was manifested upon a slight mechanical disturbance in the water of the aquarium. He states that the light is produced by a luminous fluid accumulated in the body of the larva, but the observation is too crude to be of much value. Since the aquarium had contained several other animal organisms, such as annelids, crabs, etc., and at the same time, it is quite doubtful if the luminous larvae really belong to the sponge. Pagenstecher (*Allg. Zool.*, Bd. 4, 1881, p. 14) and Peron