

## TILLITE IN NEW HAMPSHIRE

IN 1910 while spending the summer at Sugar Hill, New Hampshire, I came across a formation which appeared to me to be tillite. The Rev. S. S. Nickerson, of Sugar Hill, had a glacial-boulder of conglomerate near his house which looked as if made up of glacial pebbles. Mr. Nickerson described an exposure of conglomerate which he had seen in Lyman, 12 miles west of Sugar Hill, several years before. I visited this locality with Mr. Nickerson. The best outcrop found is about half a mile north of Young's pond by the side of a little schoolhouse, in the town of Lyman. I examined the formation and was immediately impressed with its glacial appearance. There was no stratification and the included rock fragments of various kinds scattered through an argillaceous matrix were of all sizes up to 6 feet in diameter. There were very few rounded pebbles, most of the fragments being angular and subangular. Here and there large masses of slate, greatly contorted, were found. One of them measured 6 feet long by 4 feet wide on the two exposed dimensions. These slate masses were so like the slate lumps found by me in the Squantum tillite near Boston,<sup>1</sup> that I could not avoid the conclusion that this formation might be tillite also.

On account of the very great shearing and distortion which these rocks have undergone—much greater than the Squantum tillite has been through—it will be impossible to hope for any signs of striations. Even the concave fractures so common on glaciated pebbles in till, and in the Squantum tillite, have been rendered unrecognizable. The general appearance of the rock and the distorted slate fragments are the only criteria so far found to determine the origin of this formation, and the prospects are not very bright for finding any very definite proof. To a glacial geologist, however, the appearance of the rock is almost conclusively glacial.

The thickness of this till-like section can not be less than 100 feet and is probably much

greater. The eastern contact rock is an argillaceous schist with a northeast and southwest strike and a thickness of over 1,000 feet. On the west the contact rock is conglomerate, with water-worn pebbles and some signs of stratification. The thickness of this conglomerate is uncertain, probably several hundred feet.

A few days after the examination of this section I found the "Geology of New Hampshire," by Charles H. Hitchcock, in the small library at Sugar Hill. On page 302, of Volume 2, the following description of this rock is given:

"There is a curious conglomerate west of Rev. C. Corning's, in North Lyman, lying adjacent to the Lyman group, and supposed formerly to constitute a part of it. It resembles a mass of common drift, because the pebbles are so numerous and miscellaneous arranged. They consist of both the white and green schists, and dip south 52° east. The pebbles are mostly of large size, one measuring 2 feet long and 5 inches wide. On the top of Mormon Hill, nearly two miles east of this exposure I found a very coarse conglomerate with strike N. 58° E. lying on the northwest side of clay slates dipping N. 47° W. It is probable that these two exposures belong to the same formation which runs athwart the Lyman group, and may possibly join a very coarse supposed Helderberg conglomerate in Littleton to be described presently."

These words were written long before the word "tillite" had been introduced by Professor Penck, and before the idea of rocks with a glacial origin had entered the minds of American geologists.

In the summer of 1911 I invited my friend, Dr. F. H. Lahee, to investigate with me in this region, for the purpose of finding out, if possible, the age of the formation under discussion. He spent two summers making a careful field study of all the formations. The main results of his work, without a discussion of the rock described in this paper, were published by him in the *American Journal of Science*, Vol. XXXVI, September, 1913, "Geology of the New Fossiliferous Horizon and the Underlying Rocks, in Littleton, New Hampshire." The age of the supposed tillite is still much in doubt, on account of faulting and unconformity. Professor Lahee thinks the

<sup>1</sup> See *Bulletin of the Museum of Comparative Zoology*, Vol. LVI., No. 2, "The Squantum Tillite," by Robert W. Sayles, pp. 148-155, 1914.

rock older than Permian. Hitchcock in his first writings on this region called the formation Huronian, but 30 years later referred it to the Cambrian or Ordovician. In his later opinion, however, he was not sure.<sup>2</sup> Further work will be necessary on this most difficult locality to place all the formations in their proper stratigraphical positions.

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THE PHILADELPHIA MEETING OF THE  
AMERICAN ANTHROPOLOGICAL  
ASSOCIATION

THE annual meeting of the American Anthropological Association was held at the University Museum, Philadelphia, December 28-31, 1914, in affiliation with the American Folk-Lore Society and Section H of the American Association for the Advancement of Science. The attendance was satisfactory, and a rather extensive program was presented. It was decided to hold a special session in San Francisco, August 2-7, and to empower Professor A. L. Kroeber, of the University of California, to make all arrangements relating to the meeting. A decision as to the place of the next annual meeting was referred to the executive committee. The secretary of the Committee on Phonetics, Dr. E. Sapir, read the committee's report in abstract, and the members were instructed to publish the entire report in whatever form seemed most appropriate.

The following officers for 1915 were elected by acclamation:

*President:* F. W. Hodge, Bureau of American Ethnology.

*Vice-president, 1915:* Clark Wissler, American Museum of Natural History.

*Vice-president, 1916:* A. L. Kroeber, University of California.

*Vice-president, 1917:* George B. Gordon, University of Pennsylvania.

*Vice-president, 1918:* Berthold Laufer, Field Museum, Chicago.

*Secretary:* George Grant MacCurdy, Yale University.

*Treasurer:* B. T. B. Hyde, New York City.

*Editor:* Pliny E. Goddard, American Museum of Natural History.

*Associate Editors:* J. R. Swanton, R. H. Lowie.

*Executive Committee:* A. M. Tozzer, E. Sapir, W. J. Fewkes.

<sup>2</sup> (1) Hitchcock, C. H., "Geology of New Hampshire," Vol. 2, p. 50, 1877, and (2) "Geology of Littleton, N. H.," reprint from the "History of Littleton," pp. 11 and 29, 1905.

*Council:* F. W. Putnam, F. Boas, W. H. Holmes, W. J. Fewkes, R. B. Dixon, F. W. Hodge, C. Wissler, A. L. Kroeber, G. B. Gordon, B. Laufer, G. G. MacCurdy, B. T. B. Hyde (ex-officio); A. E. Jenks, S. A. Barrett, W. Hough, A. Hrdlicka, A. M. Tozzer, F. G. Speck, A. A. Goldenweiser, E. A. Hooton, A. V. Kidder, F. C. Cole (1915); Byron Cummings, G. H. Pepper, W. C. Farabee, J. R. Swanton, G. G. Heye, H. J. Spinden, T. T. Waterman, C. M. Barbeau, W. D. Wallis, A. B. Lewis, Stansbury Hagar (1916); W. C. Mills, H. Montgomery, C. B. Moore, W. K. Moorehead, C. Peabody, C. C. Willoughby, T. Michelson, A. B. Skinner, M. H. Saville (1917); A. C. Fletcher, C. P. Bowditch, S. Culin, R. H. Lowie, C. H. Hawes, E. Sapir, N. C. Nelson, H. Bingham, J. A. Mason, G. A. Dorsey, E. W. Gifford (1918).

The sectional committee of Section H recommended the names of twenty-eight members for fellowship, and the council of the American Association for the Advancement of Science duly elected them. The recommendation of the sectional committee, that Professor George M. Stratton, of the University of California, be elected vice-president of the section for the ensuing year, was likewise approved by the general committee. Professor L. Witmer was elected a member of the council; Dr. P. E. Goddard a member of the general committee, and Professor F. Boas a member of the sectional committee to serve five years.

The American Folk-Lore Society reelected Dr. P. E. Goddard president and Professor C. Peabody secretary, and elected A. B. Skinner assistant secretary.

The address of the retiring vice-president of Section H, Professor Pillsbury, on "The Function and Test of Definition and Method in Psychology" will be published in *SCIENCE*; Dr. Goddard's presidential address before the Folk-Lore Society on "The Relation of Folk-Lore to Anthropology" will appear in *The Journal of American Folk-Lore*.

A number of the papers presented dealt with problems of general interest. Geheimrat Professor Felix von Luschan, who appeared as a guest of the Association, delivered a lecture on "Convergency." He dwelt on the importance of this originally biological concept in the field of anthropology, where both somatological and cultural resemblances can often be ranged in this category rather than under the caption of independent development. Dr. A. B. Lewis, in his paper on "Some Native Industries from New Guinea," passed from a descriptive account to significant remarks on the process of diffusion, as indicated by Oceanian data. The distribution of certain techniques in this area points not so much