

SCIENCE

NEW YORK, SEPTEMBER 18, 1891.

THE AMERICAN MUSEUM OF ARCHÆOLOGY.

ONE evening early in November, 1889, a company of gentlemen gathered in one of the rooms of the Philadelphia Club, where an elegant dinner was spread. At the head of the table sat Dr. William Pepper, provost of the University of Pennsylvania, and on his right Dr. C. C. Abbot. F. C. Macauley, Esq., sat at the foot of the table, and along the sides were men so distinguished for scientific attainments and public spirit as Professor Edward Cope, Dr. Daniel G. Brinton, Dr. Horace Jayne, the late Dr. Joseph Leidy, and two or three others, — nearly all of them officially connected with the University of Pennsylvania. This institution is not heard of so often in New York and New England as are Columbia, Harvard, and Yale, with all of which, nevertheless, it stands abreast in most particulars. Its library, for example, is one-third larger than that at Harvard.

Up to the date of this merry little feast, which is recalled on account of its results, the University of Pennsylvania had lacked anything to compare with such museums as exist at New Haven and Cambridge, and which not only offer local students of the sciences great facilities, but become centres of original research and asylums for the preservation of valuable material. Thus far in the revival of enthusiasm, which during the past few years has been stirring the alumni and friends of the university, this feature had been neglected; but after the edibles and a part of the potables above-mentioned had disappeared, it was disclosed that these gentlemen had met and dined merely as a pleasant prelude to the discussion of the ways and means of organizing an archæological department and collection in connection with their university.

Dr. Leidy took the chair, the group (excepting Dr. Abbott, to whom these proceedings were all a surprise) resolved itself into a "commission," and in fifteen minutes, promptly and picturesquely, The American Museum of Archæology was in existence.

In the course of the discussion Dr. Abbott was introduced by Dr. Pepper in a speech which reminded his hearers, that, though Dr. Abbott composed books, and had even perpetrated a sonnet now and then, it was not as a poet he was ambitious to shine; that in spite of the fact that he had written the most charming and suggestive books of out-door lore published in America, this work and the attached credit were not foremost in the author's thoughts. Dr. Abbott's chief interest had been from the first in the investigation of the habits, conditions, social advancement, and mental attitude of the American aborigines; and to him science was indebted for valuable contributions in the direction both of materials and of philosophy; while the light which Dr. Abbott had been able to throw upon the antiquity of man in the eastern part of this continent, by his discovery of the stone implements and other traces of paleolithic man in the glacial-drift gravels of the Delaware Valley, had established beyond any reasonable doubt that practically primitive men

had dwelt on these shores during, and prior to, the great glaciation of the northern half of the continent. He asked Dr. Abbott to say what disposition had been made of the great quantities of relics of prehistoric man which he had gathered, and whether the field was exhausted.

Dr. Abbott replied in a speech of some length. He said that his farm near Trenton, N.J., occupied a knoll overlooking wide meadows along the Delaware, which traditionally and evidently had been a favorite resort for the Delaware Indians and for their predecessors. From the ploughed fields and river-banks of this immediate neighborhood he had gathered some 30,000 relics, in stone, bone, and clay, of the aborigines, who had hunted, fished, camped, and manufactured their implements and utensils there. The earlier part of this collection had gone mainly to the Academy of Science at Salem, Mass., and to prominent European archæologists, but since the founding of the Peabody Museum of American Archæology and Ethnology at Cambridge, Mass., everything had been deposited there, where it constitutes the Abbott Collection, embracing 27,000 pieces. This includes the series of paleolithic (drift-gravel) implements and bones. The literary outcome had been many pamphlets and articles, and the book "Primitive Industry," which had summarized the results up to 1881. A new edition of this book is now under way, wherein later investigations will be noted.

The audience was surprised at the magnitude of what one man, with greatly limited means, had been able to accomplish, and regretted that this extremely interesting and valuable material had been taken to a distant museum out of territory which by right was local and belonged to Philadelphia, simply because that city had been too apathetic to obtain and preserve it.

Responding to a further request for advice, Dr. Abbott explained that systematic searching would bring to light a vast quantity more of the same kind of relics in the Delaware Valley, and probably largely extend our present knowledge of the prehistoric inhabitants of that region. He said that large areas of the United States were still unexplored archæologically; that there was abundant room for another organization without duplicating the labors of existing investigators; and that it was of the highest importance that such work should be done at once.

The result was the formation of an Archæological Association under the auspices of the university, the assignment of quarters for the storage and arrangement of materials, and the appointment of Dr. Abbott as curator. Subscriptions were immediately forthcoming for the present needs of the department, and a vigorous and organized effort is beginning for the accumulation of specimens and information, not only, but for the financial endowment necessary to the maintenance of the museum and the attendant instruction and publication of results. Dr. Abbott has consequently severed his official connection with the trustees of the Peabody Museum (who cordially wished him good-speed) and is devoting his energy to the work in this new field. About 25,000 specimens have already been received, and many more are promised as gifts, while the purchase of some small but valuable collections is under way. It is the policy of the

managers, however, to conduct original and intelligent explorations, rather than merely to accumulate a large quantity of "Indian relics" by purchase, and arrangements are now making for the placing of several men in the field who are experts in this kind of scientific work.

Meanwhile the valley of the Delaware is being carefully attended to, and has yielded largely, much material having been collected that throws additional light on the customs and conditions of the Indians that for so many centuries occupied this region. During the summer of 1891 a large number of village sites were exhaustively explored, and two interesting rock shelters examined; while on an island in the river was found an implement maker's work-shop, and a "cache" where 116 beautifully chipped knives, averaging about six inches in length, was brought to light. The flint (jasper) quarry from which the Indians derived their raw material for arrow-heads, knives, scrapers, and drills was also located; the shaft they had sunk examined, and a vast quantity of cores, chips, unfinished implements, and hammers, mauls, and other implement-making tools, were procured.

Recently, through the generosity of several gentlemen, the superb Cope collection was secured, so that even now the museum has excellent facilities for illustrating the conditions of human life on this continent prior to European contact.

The first annual report, a pamphlet with beautiful illustrations, has already appeared, and, better than all else, shows how rapid has been the progress of the venture.

Altogether it appears probable that an institution has been founded which will become not only a source of great local pride and influence in Philadelphia, but will powerfully advance the cause of this most interesting of sciences throughout America. The need of money is great, and the rich men of the country, especially those who are alumni of the University of Pennsylvania, or interested in this part of the country, can find here a use for a portion of their wealth which will be most fruitful in the advancement of knowledge. It is to be hoped, too, that many persons in the Southern and Middle States, who have formed small local collections of archaeological specimens, will see the wisdom of depositing them in this general museum, where they can do far more general good than hidden in isolated houses scattered about the country. May every success attend this new museum, and long live Dr. Abbott, its curator.

ERNEST INGERSOLL.

INFLUENCE OF GROUND WATER UPON HEALTH.¹

THE examination of the historic records or of the published mortality tables of this and other countries shows that there are certain conditions which are found to be present when certain diseases are most rife. It is also found, that, after eliminating certain meteorological and other influences which are supposed to affect disease, some particular diseases appear to be solely influenced by the hygrometric condition of the ground and the volume of water which is present in the ground.

In historic periods when particular epidemics have been rife, they have mostly occurred in times of drought, in which it has been established, beyond doubt, by the evidence of the failure of springs and rivers, that the ground water was then exceptionally low.

The actual measurements of the ground water in this country, in some cases, go back for a period beyond that of the registration of deaths, consequently a comparison can be made between the

state of the ground water and the death-rate of any particular period; and when such examination is made it is found that there is a coincidence between the state of the ground water and the deaths recorded. The deaths follow, as a rule, in the inverse ratio, the state of the lowest ground water; that is, high low water indicates a healthy period, while low low water marks the unhealthy periods. Investigations respecting the influence of ground water upon health should be studied over limited areas, as the distribution of rain is often very local, and there are varieties in the geological character of the soil that affect the result of observations carried on over large areas, and on this account, while observations have been carried on by the author over an extended area, he has always used local observations to compare with the mortality returns in the same district, and he has specially dealt with the records of Croydon, which is the place where the observations as to percolation, evaporation, and the hygrometric condition of the soil have been locally studied.

There is every reason to believe that the ground water itself, except when polluted, exercises no influence as a cause of disease, but is merely the measure or indicator of the influences which are at work within a polluted soil, and of certain organic changes which evidently take place within the dark recesses of the soil, and which lead to the development of the conditions favorable to a certain class of disease. That the earth does exercise a baneful effect upon health is well known from the experience in this country of the unhealthfulness of cellar dwellings, and from the fact that persons habitually living upon ground floors are not so healthy as those living in the upper stories of buildings removed from the influence of the ground.

There is a seasonable fluctuation in the waters in the ground, and, as a rule, these waters are lowest in the autumn and early winter, and highest in the spring or early summer; but in some years the period of both low and high water varies, as, for example, the low water of last season did not take place until February of this year (1891).

It is also known that the artificial lowering of the sub-soil waters of a district has produced the same effects upon the health as occurs when a general lowering of the ground water arises naturally from drought.

The actual drying of the ground is a condition which is favorable to the general good health in this country, and this circumstance often masks, in the general death-rate, the potential influence of certain diseases, so that the general health of a district appears to be good, while at the time it may suffer intensely from a certain class of disease of which low ground water is the indicator. When, however, the conditions become extremely intense, and the ground water exceptionally low, the influences at work affect the death-rates as a whole. On the other hand, in periods of excessive rain with high ground water, the conditions are usually favorable to health, and all places in which the ground waters are of a uniform level, such as seaside places, which are governed by the mean tide level, and river valleys with porous soils, like that of the River Wandle, in which the water is headed up to a uniform level by mills, are usually healthy.

It is known that the measure of the effect of the ground water is most marked in districts which draw their water supply from the ground, and amongst that section of the inhabitants who use such water for dietetic and other purposes, especially in the case of young children and teetotallers.

The unhealthy time after the period of excessive low water is that when the first rain begins to percolate through the soil, just as if it washed out matters which had been specially prepared or were retained in the dark recesses of the soil, into the water, or by driving out the ground air specially charged with the poison of disease. It is by no means uncommon both in this and other countries to find that particular epidemic outbreaks which have become rife at a low-water period can be traced to particular rain-falls. In this country since we have the registration of deaths, those quarters of the year when percolation has first commenced after periods of exceptionally low water are, without exception, the most unhealthy seasons that have been recorded. The quarters of the year when percolation first commenced after exceptionally low water have been the most unhealthy, as, for example, the

¹ Abstract of a paper read before the Congress of Hygiene, in London, England, August, 1891, by Baldwin Latham, F.G.S.