# THE BASIC NEEDS OF AMERICAN ARCHEOLOGY

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LATE in April of this year there was appointed in the Division of Anthropology and Psychology of the National Research Council a committee to study the basic needs of American archeology. This committee is composed of W. D. Strong, *chairman,* Clark Wissler, A. V. Kidder, Fay-Cooper Cole, W. C. McKern, J. O. Brew and W. S. Webb. Before undertaking a detailed examination of the archeological problems, the committee felt that it was best to limit its sphere of interests by an analysis of the principles which govern the methods and procedures of American archeological research. At a meeting late in June a preliminary statement of these principles was prepared, upon which this article is based. This first report of the committee constitutes a declaration of the field of interest of the committee and indicates the nature of the basic needs of American archeology which will be studied in its future deliberations. Mimeographed copies of this preliminary report may be obtained from the Division of Anthropology and Psychology, National Research Council, 2101 Constitution Avenue, Washington, D. C.

The aim of American archeology is "to make the past live again," to preserve for posterity the story of the rise and spread of early cultures on this continent and their influence on white settlement. From such studies much can be learned, not only in the field of human history, but also of such significant subjects as long-continued land utilization, cycles of climatic change and the history of important agricultural crops. It is obvious that the competent archeologist must be completely trained in all aspects of anthropology and historical method, in order to be able to interpret these data adequately.

In every part of this country a great deal of excavation and collecting has been carried on, often by untrained persons and without well-defined aims. These activities have irrevocably destroyed many pages of unwritten American history.

More recently state and federal projects have been inaugurated, in some cases to afford employment, in others to rescue prehistoric records in districts about to be flooded. Out of these latter efforts, and through excavations carried on by universities and other scientific organizations, much experience and knowledge have been gained. These projects are being continued, and others are contemplated. It therefore seems urgent that this committee of the National Research Council set forth in brief form what it believes to be the minimum requirements for any future work, whether under public or private auspices.

In initiating an archeological research project, a definite need should be shown for the solution of a well-defined archeological problem or for the conservation of prehistoric material placed in jeopardy by public works or other agencies, whether natural or human. The program of the work should propose a comprehensive archeological investigation. The sponsoring scientific institution or learned society should be able to guarantee adequate supervision and field management, laboratory restoration and study of material, permanent conservation of all materials and records and the publication of a final report. The committee suggests it is essential in the case of all archeological projects sponsored by federal funds that the representative of the sponsoring agent should be approved by the Smithsonian Institution, whose national character and scientific attainments make it the most satisfactory qualifying agent in the country.

Field operations should be conducted by trained field men with academic training as well as field experience. The general supervision of the field work should insure that adequate records be kept and that the work be done with a clear comprehension of the problem under attack. Naturally a balanced supply of surveying instruments, cameras, tools, supplies and storage and transportation facilities must be available. The supervisory staff must be given time for experimentation, rechecking of records and data, and careful completion of operations begun, as well as for the preparation of a full and complete field report. Time limitations should never be permitted to induce rush tactics which might promote carelessness or curtail efficiency.

The laboratory phase of the project should be conducted by trained laboratory technicians and a sufficiently large staff to care for field material as rapidly as it is acquired. The general supervision of the work should insure close cooperation between laboratory and field work in order that each may aid the other in the solution of the problem. As many allied sciences as may be necessary should be brought to bear upon the laboratory investigation.

The methods and techniques used in an archeological project are different, of course, in the field and in the laboratory. Both phases of the project should be under the general direction of a director. The active field director should possess a comparative knowledge of methods of work and the ability to adjust or revise these to suit the particular conditions under which he is working. In organizing a field party, specific types of work should be placed in the hands of capable men under the immediate direction of competent super-

visors. In order to secure most efficient service on the part of all concerned, it is essential that responsibility be vested with corresponding authority.

In survey work the preparation of maps and charts is one of the primary objectives. An accurate map should show the relationship of a site to the natural and significant cultural environment. The more detailed working plan, whether based upon the grid system or other arrangements of reference points and lines, should insure accuracy both for the initial surface charts and for the vertical and horizontal records. In so far as possible the site nomenclature should be in accordance with a statewide plan.

The methods employed in excavation should be selected to facilitate the clearest perception of the archeological phenomena. The soil may be removed by peeling, by vertical sectioning, by horizontal stripping in arbitrary levels or by combining these several procedures as dictated by the specific nature of the problems involved and the peculiarities of the site. In all cases, work must be conducted in a manner which promises to disclose all available evidence on formation and structure, and to preserve all data on stratigraphy, age, time succession, cultural and historical activities and cultural processes.

In all field work, whether it be a survey or an excavation, complete documentation is essential. The progress of the work must be fully documented by charts and texts. There must be full recording of finds and associations, preferably by filling out a standard form to insure complete and comparable information. Finally, there must be well-organized and integrated identifications, including good and complete photographic records.

The satisfactory application of laboratory methods presupposes the existence of a well-equipped laboratory for the storage of materials and for their analysis in order to facilitate definition of types, cultural synthesis and broad cultural comparisons.

The many and varied activities of the laboratory consist of: the recording, preservation and technical analysis and study of all tangible materials, including physical anthropological data; the integration and filing of all documentary records; the coordination of material data with other data to determine culture complexes and relationships, as well as the origin and development of these cultures; and finally, the preparation of the manuscript report for publication.

All the foregoing activities are nullified unless followed by prompt publication. There are several essential steps in the realization of this final scientific objective. Firstly, the daily notes on excavations, plans of trenches, lists of finds and photographs should be typed and otherwise recorded from day to day. This is so essential that the appropriation for each project should provide for the necessary clerical assistance in the field.

Secondly, when the record is approved by the archeologist in charge, three complete copies should be made. Where projects are under government auspices, one of these should be deposited in the Smithsonian Institution. If the sponsoring institution possesses an adequate library, the second copy should remain there; otherwise, it should be placed in the library of the state university. The third may be used as the working copy of the archeologist in charge, but ultimately should be deposited in some important library.

Thirdly, adequate arrangements should be made to supply the archeologist in charge with time and clerical and technical assistance for the preparation of an adequate final report of the work. It must be remembered, in this connection, that the study of materials and the preparation of a final report normally requires at least as much time as is devoted to field work.

A satisfactory final report should contain at a minimum a statement of the problem attacked, a description of the methods employed, an adequate descriptive and illustrative review of the data and a final section containing such interpretations and conclusions as are justified by the data.

Finally, in establishing any archeological program, whether for purely scientific purposes or in conjunction with problems of state or federal employment, the basic need for national conservation must be given primary consideration. Not only should each site opened be excavated with the greatest care, the material completely studied, and the results fully published, but also certain sites in every area should be carefully preserved for research in the future as new techniques are developed. The fencing, restoration, marking and guarding of important prehistoric sites is particularly applicable at the present time, permitting as it does the use of local labor and the advancement of historical interest.

Such forward-looking activities should extend from the National Park Service on the one hand to State Historical Societies and municipalities on the other. They will advance the growth of national consciousness as well as scientific progress, and should receive every encouragement.

It should always be remembered that the number of archeological sites in the United States is strictly limited, and that once a site has been carelessly excavated its value is totally destroyed. These ancient ruins are really material documents that comprise the very stuff of American history. From them we may learn not only the manner in which the New World was originally settled and how its strongly individualized and truly remarkable civilizations arose, but also determine

the history and nature of various important American agricultural crops. In addition, the practical problem of the sequence and duration of postulated post-glacial climatic cycles may only be solved when the archeological record is clear.

For these and similar reasons, it is the fundamental belief of the Committee on Basic Needs in American Archeology of the National Research Council that unless the foregoing minimum requirements of scientific archeology can be fully met by any federal, state or local institution, it should not undertake archeological research.

# OBITUARY

## FLOYD KARKER RICHTMYER

ON November 7 death came without warning to Dean Richtmyer of Cornell University. He collapsed while preparing to go to a concert with his family, and before the doctor arrived he was dead from coronary thrombosis. Thus was struck down, in the full tide of amazing activity, a prominent figure of the Cornell campus and one of the most influential members of several learned societies and institutions.

Floyd Karker Richtmyer was born on October 12, 1881, in the rural community of Cobleskill, New York. He showed an early interest in scientific research as an undergraduate at Cornell University. After graduation in 1904 he married and taught for two years at Drexel Institute, Philadelphia; then he returned to Cornell as instructor in physics, and in 1910 was awarded the degree of Ph.D.

In his activities as a graduate student, the main lines and characteristics of Richtmyer's life work are already visible. Stimulated by E. L. Nichols to an interest in photometry, he presented a paper before the Illuminating Engineering Society in which he advocated more instruction in the subject of illumination for engineers and described a new laboratory course in the subject. Thus he showed an early interest both in educational problems and in the applied side of physics. For the subject of his Ph.D. research, however, he chose the photoelectric properties of the alkali metals. In this investigation he did the careful, clean-cut experimental work for which he possessed an unusual talent; and he also revealed his outstanding characteristics of looking at a set of data from all angles and extracting from them every possible conclusion. He was preeminently a man with a passion for doing things well; and he saw many things to do.

From this point, Richtmyer's career falls naturally into three periods. During the first, he taught physics for students of engineering and pursued his interests in applied optics. In the Illuminating Engineering Society we find him on the council and on several committees, acting as chairman of a committee on education. Furthermore, in 1916 he assisted in the organization of the Optical Society of America, and throughout his life he contributed greatly to the work of that society; he was president in 1920, and for 22 years he participated in the conduct of the *Journal*, becoming editor in 1933.

About 1918, however, when he became full professor of physics, Richtmyer began to turn toward other fields. After a brief interlude in the study of thin films he developed an interest in x-rays which was destined to be permanent and to establish him as an authority in the field. After spending a sabbatic year as "investigator" in the laboratories of the General Electric Company, he undertook at Cornell a series of well-planned and precisely executed measurements on topics related to x-ray absorption, the principal result of which was to establish the law that absorption due to ionization in a given shell in an atom is proportional to the cube of the wave-length of the x-rays and to the fourth power of the atomic number. Then, in 1927, as a result of several months in Siegbahn's laboratory in Uppsala, Sweden, he became interested in the faint x-ray lines known as "satellites." He proposed a new theory concerning the origin of these lines, ascribing them to jumps made simultaneously by two electrons in an ionized atom; and he made a series of experimental studies in an endeavor to support the theory. Later he himself recognized, in the light of further developments, that most of the observed satellites are probably due to a mechanism proposed earlier by others, namely, to a one-electron jump in a doubly ionized atom; but it is still possible that some of the faintest lines are of his double-jump type.

Richtmyer's interest in x-ray research continued to the end. He inspired and supervised a number of investigations which did much to clear up the subject of x-ray line widths and shapes; after 1930, however, the actual work was done by others. His enthusiasm and obvious mastery of fact and technique attracted many graduate students into his field, and during many years he had the help of an assistant. His attainments as a scientist were given recognition by his election as president of the American Physical Society in 1936, and as vice-president in charge of section B of the American Association for the Advancement of Science in 1930; and in 1932 he was elected to the National Academy of Sciences (councilor in 1938).

About 1931 began the third period of Richtmyer's activities, during which most of his time was devoted to administrative work of wide variety. In that year he became dean of the graduate school at Cornell. In this capacity he strove, with tact and infinite patience, for the maintenance of high standards, hampered by