

years ago, after I had finished my studies I laid out a plan for my future work. The leading question for this plan was: Is it possible to apply the methods of natural science, more particularly of physics to psychology. This led me to researches on psychophysics and induced me to follow a certain method of ethnological researches. I believe the fundamental question is: How far does an influence of the surroundings exist? In studying this question I found it necessary to limit my inquiry to a study of the influence of geographical surroundings upon migrations and certain classes of ideas. Even these I found to be extremely complex, and began to inquire into their psychological elements. Studying the literature from this standpoint I found, that I could not understand the questions and facts without practical experience; I considered it necessary to study on the spot a people living in a wide area of uniform character.

I considered the Eskimos the best race for these studies and consequently went there. After my return I carried on my researches from the same point of view. The longer I studied the more I became convinced that the phenomena such as customs, traditions and migrations are far too complex in their origin, as to enable us to study their psychological causes without a thorough knowledge of their history. I concluded it necessary to see a people, among which historical facts are of greater influence than the surroundings and selected for this purpose Northwest America.

I write this in order to explain to you the special line of study which I pursue, and to show you, that my explorations were not made at random. This will also explain to you the foundation of my criticism of Prof. Mason's method, which will be set forth more fully in the next issue of "Science." In connection with these remarks it may be of interest to you to see some of my psychological papers, which I send along with this letter.

Yours, very truly,

DR. FRANZ BOAS



SELECTION 7

The Principles of Ethnological Classification

The leading idea of Otis T. Mason's writings on ethnology is his attempt to classify human inventions and other ethnological phenomena in the light of biological specimens. "They may be divided into families, genera, and species. They may be studied in their several ontogenies (that is, we may watch the unfolding of each individual thing from its raw material to its finished production). They may be regarded as the products of specific evolution out of natural objects serving human wants and up to the most delicate machine performing the same function. They may be modified by their relationship, one to another, in sets, outfits, apparatus, just as the insect and flower are co-ordinately transformed. They observe the law of change under environment and geographical distribution." This method of research is founded on the hypothesis that a connection of some kind exists between ethnological phenomena of a people widely apart. Professor Mason is of this opinion, and expresses it as follows: "Anthropologists assign similar inventions observed in different parts of the world to one of the following causes: 1. The migration of a certain race of people who made the invention. 2. The migration of ideas—that is, an invention may be made by a certain race of people and taught or loaned to peoples far removed in time and place. 3. In human culture, as in nature elsewhere, like causes produce like effects. Under the same stress and resources the same inventions will arise." From this standpoint Professor Mason has arranged the ethnological collections of the national museum according to objects, not according to the tribes to whom they belong, in order to show the different species of throwing-sticks, basketry, bows, etc.

We cannot agree with the leading principles of Professor Mason's ethnological researches. In his enumeration of causes of similar inventions, one is omitted, which overthrows the whole system: unlike causes produce like effects. It is of very rare occurrence that the existence of like causes for similar inventions can be proved, as the elements affecting the human mind are so complicated, and their influence is so utterly

"The Occurrence of Similar Inventions in Areas Widely Apart," and "Museums of Ethnology and Their Classification," *Science* 9 (1887): 485-486, 587-589.

unknown, that an attempt to find like causes must fail, or will be a vague hypothesis. On the contrary, the development of similar ethnological phenomena from unlike causes is far more probable, and due to the intricacy of the acting causes. As far as inventions are concerned, the disposition of men to act suitably is the only general cause; but this is so general, that it cannot be made the foundation of a system of inventions.

But from still another point of view we cannot consider Professor Mason's method a progress of ethnological researches. In regarding the ethnological phenomenon as a biological specimen, and trying to classify it, he introduces the rigid abstractions species, genus, and family into ethnology, the true meaning of which it took so long to understand. It is only since the development of the evolutionary theory that it became clear that the object of study is the individual, not abstractions from the individual under observation. We have to study each ethnological specimen individually in its history and in its medium, and this is the important meaning of the 'geographical province' which is so frequently emphasized by A. Bastian. By regarding a single implement outside of its surroundings, outside of other inventions of the people to whom it belongs, and outside of other phenomena affecting that people and its productions, we cannot understand its meaning. The only fact that a collection of implements used for the same purpose, or made of the same material, teaches, is, that man in different parts of the earth has made similar inventions, while, on the other hand, a collection representing the life of one tribe enables us to understand the single specimen far better. Our objection to Mason's idea is, that classification is not explanation.

His method, as far as applied to objects which have a close connection with each other, is very good. The collection of moon-shaped Eskimo knives or labrets from North-west America has given us great pleasure, and enables us to trace the distribution of those implements; but even they do not fully answer the purpose of ethnological collections. Besides these, we want a collection arranged according to tribes, in order to teach the peculiar style of each group. The art and characteristic style of a people can be understood only by studying its productions as a whole. In the collections of the national museum the marked character of the North-west American tribes is almost lost, because the objects are scattered in different parts of the building, and are exhibited among those from other tribes.

Another instance will show that the arrangement of similar implements does not serve the purpose of ethnological collections. From a collection of string instruments, flutes, or drums of 'savage' tribes and the modern orchestra, we cannot derive any conclusion but that similar means have been applied by all peoples to make music. The character of their music, the only object worth studying, which determines the form of the instruments, cannot be understood from the single instrument, but requires a complete collection of the single tribe. Here, however, it can be seen that

each ethnological collection affords only very fragmentary instruction; that its real use is only to illustrate descriptions of the tribes. For a study of native art and its development, they are indispensable. For this purpose, duplicates, of which the superficial visitor of ethnological museums frequently complains, are absolutely necessary. They are the only means of determining what is characteristic of a tribe, and what is merely incidental.

Mason's method takes a place in ethnology similar to the former 'comparing method' in geography. A mere comparison of forms cannot lead to useful results, though it may be a successful method of *finding* problems that will further the progress of science. The thorough study must refer to the history and development of the individual form, and hence proceed to more general phenomena.

Prof. Otis T. Mason's reply to my remarks on his views of the methods of ethnology is mainly a justification of his plan of arranging the collections of the national museum. As this plan is the outcome of his philosophical view of the problems of ethnology, we must scrutinize these in order to judge as to the merits of his system.

His principle object is the study of each and every invention among peoples of all races and countries. I am well aware that this idea was and is shared by many scientists; and at this very moment I read with interest Mantegazza's proposal of erecting a 'psychological museum,' i.e., a museum of ethnological objects arranged according to the ideas to which they belong. Professor Mason's rank among American ethnologists, however, and the weight he can give to his opinions by the arrangement of the large collections of the national museum according to his theories, induce me to criticize his views more particularly.

My view of the study of ethnology is this: the object of our science is to understand the phenomena called ethnological and anthropological, in the widest sense of those words,—in their historical development and geographical distribution, and in their physiological and psychological foundation. These two branches are opposed to each other in the same way as are biology and the so-called systematic 'organology,' or, as I have called it in another place (*Science*, ix. No. 210), when treating on the study of geography, 'physical science and cosmography'; the former trying to deduce laws from phenomena, the latter having for its aim a description and explanation of phenomena. I tried to show that both branches are of equal scientific value.

Let us inquire which method must be applied to carry on ethnological researches of either kind. Ethnological phenomena are the result of the physical and psychical character of men, and of its development under the influence of the surroundings; therefore two problems must be studied for attaining scientific results. The preliminary study is that of the surroundings: the final aim of the researches is the knowledge of the

laws and history of the development of the physiological and psychological character of mankind. 'Surroundings' are the physical conditions of the country, and the sociological phenomena, i.e., the relation of man to man. Furthermore, the study of the present surroundings is insufficient: the history of the people, the influence of the regions through which it passed on its migrations, and the people with whom it came into contact, must be considered. All of these are phenomena which may directly be observed by a well-trained observer, or may be traced with greater or less accuracy by historical researches.

The second part of ethnological researches is far more difficult. The physical and psychical character of a people is in itself the result of the action of the surroundings, and of the way in which the present character was attained. Each stage in the development of a people leaves its stamp, which cannot be destroyed by future events. Thus it appears that the elements of the character of a people are extremely complex. There are two ways of treating this problem.

One of the remarkable features of such problems is the occurrence of similar inventions in regions widely apart, and without having a common origin. One method of studying them—and this is Professor Mason's method—is to compare the phenomena, and to draw conclusions by analogy. It is the deductive method. The other method is to study phenomena arising from a common psychical cause among all tribes and as influenced by their surroundings; i.e., by tracing the full history of the single phenomenon. This is the inductive method. For this method of study, the tribal arrangement of museum specimens is the only satisfactory one, as it represents the physical and ethnical surroundings.

I will explain these ideas by giving an example. It has frequently been proposed to establish a museum illustrating the adaptation of organisms to surroundings. The aim of this study is to find the physiological laws or the combination of causes which have the effect of causing these adaptations. The classification and arrangement must, of course, be made according to surroundings, in order to show their influence on different kinds of organisms.

An ethnological collection is analogous to this. The objects of study are researches on psychology. The method of researches is a study of the surroundings. The surroundings are physical and ethnical: therefore the arrangement must also be physical and ethnical, as this is the only way to show the single phenomenon in its peculiar character and surroundings.

It has been the tendency of science to confine the domain of deductive methods more and more, and not to be content with arguments from analogy, which are the foundation of most errors of the human mind, and to which may be traced the religious and other ideas of man in a primitive state of culture, and, to a certain degree, even in a state of advanced civilization. Science is constantly encroaching upon the domain of the argument from analogy, and demands inductive methods.

Nevertheless the psychological and scientific value of the argument from analogy cannot be overrated: it is the most effective method of finding problems. The active part it plays in the origin of philosophical systems and grand ideas which sometimes burst upon scientists is proof of this. But, as far as inductive methods can be applied,—and we believe that their domain will continue to increase,—induction must scrutinize the ideas found by deduction. Therefore I shall call Professor Mason's system a suggestive one, but not fit for scientific researches, as it does not allow the application of the inductive method.

But even this acknowledgment must be limited. The technological idea, which Professor Mason has made the leading one in the arrangement of the collection of the national museum, is only one side, and a very limited one, of the wide field of ideas which must be leading in a 'psychological museum,' as Mantegazza calls it.

The rattle, for instance, is not merely the outcome of the idea of making noise, and of the technical methods applied to reach this end: it is, besides this, the outcome of religious conceptions, as any noise may be applied to invoke or drive away spirits; or it may be the outcome of the pleasure children have in noise of any kind; and its form may be characteristic of the art of the people. Thus the same implement belongs to very different departments of a psychological museum.

Furthermore, let us inquire what is the psychological principle upon which Mason's system is founded. The leading idea is technology. The foundation of technics is the faculty of acting suitably: consequently the purpose of the implement must be made the principle of division. For instance, all kinds of cooking-pots and other arrangements for cooking would belong to one class. The mere fact that certain pots are made of clay would not justify the establishment of a pottery department. This quality of being made of clay is incidental, and does not agree with the psychological basis.

There is one point of view which justifies a classification according to inventions in a psychological museum. This is the extent to which each invention is used by a people: for instance, in what branches of life pottery is made use of, which may be limited in one tribe, very wide in another. But in this case the purpose of the object will not be the principle of division, but the principal invention applied in its manufacture; and thus the specimens would not be arranged according to Professor Mason's system, objects serving widely differing purposes belonging to one class. Therefore I cannot consider it justifiable to make technology, in the sense Professor Mason does, the basis of arranging ethnological collections.

One reason ought to make us very cautious in applying the argument from analogy in ethnology as well as in other sciences of similar character; biology, for instance. Former events, as I have already said, leave their stamp on the present character of a people. I consider it one of the

this, on account of the lack of specimens, or, more frequently, on account of the lack of our knowledge; but it is my ideal of an ethnological museum. I wish to state here again that I am not at all opposed to Mantegazza's psychological museum, which will be very suggestive and important for the development of science, but I consider the ethnological museum indispensable for controlling the ideas suggested by the analogies shown in the psychological collection, and as the only means of showing the state of culture of man.



SELECTION 8

The Aims of Ethnology

The development of our science itself has only become possible due to the general recognition the principle of the theory of evolution has attained in recent decades. It is a common characteristic of all forms of evolutionary theory that every living being is considered as the product of an historical development. The fate of an individual influences not only the individual himself, but his successors as well; and in order to understand an organism it is therefore necessary not only to know its own history but also that of its forebears. This perspective opens the whole vast field of the natural sciences to the historical method, and has contributed fundamentally to its rapid advance. Ethnology has existed only since this perspective has found common acceptance, for it has taught us to understand that no occurrence in the life of a people disappears without a trace, but affects even the most distant generations. The myths which our ancestors told to each other and in which they believed, have left their impress upon the ways of thinking of their descendants who came under the spiritual domination of a foreign culture. Even the most brilliant genius is influenced by his age and his environment, which is itself a product of the past. Thus culture-history teaches the continuity of inventions and ideas from the levels at which we find primitive peoples today up to our own time. The history of the sciences, the history of

Die Ziele der Ethnologie (New York: Hermann Bartsch, 1889), pp. 17-24. For this translation (which dates from my tenure at the University of California, Berkeley) I am indebted to two research assistants, John Gillingham (who did the major work on the present version) and David Nicholas (who did an earlier version), and to Professor Reginald Zelnik, who checked the final version with me.

greatest achievements of Darwinism to have brought to light this fact, and thus to have made a physical treatment of biology and psychology possible. The fact may be expressed by the words, "the physiological and psychological state of an organism at a certain moment is a function of its whole history"; that is, the character and future development of a biological or ethnological phenomenon is not expressed by its appearance, by the state in which it is, but by its whole history. Physicists will understand the important meaning of this fact. The outward appearance of two phenomena may be identical, yet their immanent qualities may be altogether different: therefore arguments from analogies of the outward appearance, such as shown in Professor Mason's collections, are deceptive. These remarks show how the same phenomena may originate from unlike causes, and that my opinion does not at all strive against the axiom, 'Like effects spring from like causes,' which belongs to that class of axioms which cannot be converted. Though like causes have like effects, like effects have not like causes.

From my statement it will be understood that I cannot content myself with Mr. Dall's remark, in the letter contained in to-day's issue, that both standpoints contain part of the truth. I have expressed in another place (*Verh. Ges. für Erdkunde*, Berlin, 1886, No. 7) my opinion on Dall's ethnological method, and emphasized, as I have here also, the necessity of studying each ethnological phenomenon individually.

In conclusion I have to add a few words on the practical side of the question upon which Professor Mason and Mr. Dall touch. In regard to this question, I concur with Mr. Dall, and believe that the public will be much more benefited by the tribal arrangement of ethnological collections.

I cannot agree with Professor Mason's proposal of arranging the cases like a checker-board. In ethnology all is individuality. We should be compelled to leave long rows of cases empty, as certain phenomena occur but in very few tribes. It would be almost impossible to show in this way all important ethnological phenomena, the historical development of tribes, the influence of neighbors and surroundings, etc. It is my opinion that the main object of ethnological collections should be the dissemination of the fact that civilization is not something absolute, but that it is relative, and that our ideas and conceptions are true only so far as our civilization goes. I believe that this object can be accomplished only by the tribal arrangement of collections. The second object, which is subordinate to the other, is to show how far each and every civilization is the outcome of its geographical and historical surroundings. Here the line of tribal arrangement may sometimes be broken, in order to show an historical series of specimens; but I consider this latter point of view subordinate to the former, and should choose to arrange collections of duplicates for illustrating those ideas, as it were, as an explanation of the facts contained in the tribal series. Of course, it is generally impossible to do