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THE HISTORY OF ANTHROPOLOGY.*

I HAVE been asked to speak on the history of anthropology. The task that has been allotted to me is so vast and the time at my disposal is so short, that it will be impossible to do justice to the work of the minds that have made anthropology what it is. It would even be futile to characterize the work of the greatest among the contributors to our science. All that I can undertake to do is to discuss the general conditions of scientific thought that have given rise to anthropology.

Viewing my task from this standpoint, you will pardon me if I do not first attempt to define what anthropology ought to be, and with what subjects it ought to deal, but if I take my cue rather from what it is, and how it has developed.

Before I enter into my subject I will say that the speculative anthropology of the 18th and of the early part of the 19th century is distinct in its scope and method from the science which is called anthropology at the present time and is not included in our discussion.

At the present time anthropologists occupy themselves with problems relating to the physical and mental life of mankind as found in varying forms of society, from the earliest times up to the present period, and in all parts of the world. Their researches bear upon the form and functions of the body as well as upon all kinds of manifestations of mental life. Accordingly, the subject matter of anthropology is partly a branch of biology, partly a branch of the mental sciences. Among the mental phenomena language, invention, art, religion, social organization and law have received particular attention. Among anthropologists of our time we find a consid-

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erable amount of specialization of the subject matter of their researches according to the divisions here given.

As in other sciences whose subject matter is the actual distribution of phenomena and their causal relation, we find in anthropology two distinct methods of research and aims of investigation: the one, the historical method, which endeavors to reconstruct the actual history of mankind; the other, the generalizing method, which attempts to establish the laws of its development. According to the personal inclination of the investigator, the one or the other method prevails in his researches. A considerable amount of geographical and historical specialization has also taken place among what may be called the historical school of anthropologists. Some devote their energies to the elucidation of the earliest history of mankind, while others study the inhabitants of remote regions, and still others the survivals of early times that persist in our midst.

The conditions thus outlined are the result of a long development, the beginnings of which during the second half of the 18th century may be clearly observed. The interest in the customs and appearance of the inhabitants of distant lands is, of course, much older. The descriptions of Herodotus show that even among the nations of antiquity, notwithstanding their self-centered civilization, this interest was not lacking. The travelers of the Middle Ages excited the curiosity of their contemporaries by the recital of their experiences. The literature of the Spanish conquest of America is replete with remarks on the customs of the natives of the New World. But there is hardly any indication of the thought that these observations might be made the subject of scientific treatment. They were and remained curiosities. It was only when their relation to our own civilization became the subject of inquiry that the foundations of anthropology were laid. Its germs may be discovered in the early considerations of theologists regarding the relations between pagan religions and the revelations of Christianity. They were led to the conclusion that the lower forms of culture, more particularly of religion, were due to degeneration, to a falling away from the revealed truth, of which traces are to be found in primitive beliefs.

During the second half of the eighteenth century we find the fundamental concept of anthropology well formulated by the rationalists who preceded the French Revolution. The deep-seated feeling that political and social inequality was the result of a faulty development of civilization and that originally all men were born equal, led Rousseau to the naïve assumption of an ideal natural state which we ought to try to regain. These ideas were shared by many and the relation of the culture of primitive man to our civilization remained the topic of discussion. To this period belong Herder's 'Ideen zur Geschichte der Menschheit,' in which perhaps for the first time the fundamental thought of the development of the culture of mankind as a whole is clearly expressed.

About this time Cook made his memorable voyages and the culture of the tribes of the Pacific Islands became first known to Europe. His observations and the descriptions of Forster were eagerly taken up by students and were extensively used in support of their theories. Nevertheless even the best attempts of this period were essentially speculative and deductive, for the rigid inductive method had hardly begun to be understood in the domain of natural sciences, much less in that of the mental sciences.

While, on the whole, the study of the mental life of mankind had in its beginning decidedly a historical character, and while knowledge of the evolution of civilization

was recognized as its ultimate aim, the biological side of anthropology developed in an entirely different manner. It owes its origin to the great zoologists of the eighteenth century, and in conformity with the general systematic tendencies of the times, the main efforts were directed towards a classification of the races of man and to the discovery of valid characteristics by means of which the races could be described as varieties of one species or as distinct species. The attempts at classification were numerous, but no new point of view was developed.

During the nineteenth century a certain approach between these two directions was made, which may be exemplified by the work of Klemm. The classificatory aspect was combined with the historical one and the leading discussion related to the discovery of mental differences between the zoological varieties or races of men, and to the question of polygenism and monogenism. The passions that were aroused by the practical and ethical aspects of the slavery question did much to concentrate attention on this phase of the anthropological problem.

As stated before, most of the data of anthropology had been collected by travelers whose prime object was geographical discoveries. For this reason the collected material soon demanded the attention of geographers, who viewed it from a new standpoint. To them the relations between man and nature were of prime importance and their attention was directed less to psychological questions than to those relating to the dependence of the form of culture upon geographical surroundings, and the control of natural conditions gained by man with the advance of civilization.

Thus we find about the middle of the nineteenth century the beginnings of anthropology laid from three distinct points of view: the historical, the classificatory and the geographical. About this time the historical aspect of the phenomena of nature took hold of the minds of investigators in the whole domain of science. Beginning with biology, and principally through Darwin's powerful influence, it gradually revolutionized the whole method of natural and mental science and led to a new formulation of their problems. The idea that the phenomena of the present have developed from previous forms with which they are genetically connected and which determine them, shook the foundations of the old principles of classification and knit together groups of facts that hitherto had seemed disconnected. Once clearly enunciated, the historical view of the natural sciences proved irresistible and the old problems faded away before the new attempts to discover the history of evolution. From the very beginning there has been a strong tendency to combine with the historical aspect a subjective valuation of the various phases of development, the present serving as a standard of comparison. The oft-observed change from simple forms to more complex forms, from uniformity to diversity, was interpreted as a change from the less valuable to the more valuable and thus the historical view assumed in many cases an ill-concealed teleological tinge. The grand picture of nature in which for the first time the universe appears as a unit of ever-changing form and color, each momentary aspect being determined by the past moment and determining the coming changes, is still obscured by a subjective element, emotional in its sources, which leads us to ascribe the highest value to that which is near and dear to us.

The new historical view also came into conflict with the generalizing method of science. It was imposed upon that older view of nature in which the discovery of general laws was considered the ultimate aim of investigation. According to this

view laws may be exemplified by individual events, which, however, lose their specific interest once the laws are discovered. The actual event possesses no scientific value in itself, but only so far as it leads to the discovery of a general law. This view is, of course, fundamentally opposed to the purely historical view. Here the laws of nature are recognized in each individual event, and the chief interest centers in the event as an incident of the picture of the world. In a way the historic view contains a strong, esthetic element, which finds its satisfaction in the clear conception of the individual event. It is easily intelligible that the combination of these two standpoints led to the subordination of the historical fact under the concept of the law of nature. Indeed, we find all the sciences which took up the historical standpoint for the first time, soon engaged in endeavors to discover the laws according to which evolution has taken place. The regularity in the processes of evolution became the center of attraction even before the processes of evolution had been observed and understood. All sciences were equally guilty of premature theories of evolution based on observed homologies and supposed similarities. The theories had to be revised again and again, as the slow progress of empirical knowledge of the data of evolution proved their fallacy.

Anthropology also felt the quickening impulse of the historic point of view, and its development followed the same lines that may be observed in the history of the other sciences. The unity of civilization and of primitive culture that had been divined by Herder now shone forth as a certainty. The multiplicity and diversity of curious customs and beliefs appeared as early steps in the evolution of civilization from simple forms of culture. The striking similarity between the customs of remote districts was the proof of the uniform manner in which civilization had developed the world over. The laws according to which this uniform development of culture took place became the new problem which engrossed the attention of anthropologists.

This is the source from which sprang the ambitious system of Herbert Spencer and the ingenious theories of Edward Burnett Tylor. The underlying thought of the numerous attempts to systematize the whole range of social phenomena or one or the other of its features—such as religious belief, social organization, forms of marriage—has been the belief that one definite system can be found according to which all culture has developed, that there is one type of evolution from a primitive form to the highest civilization which is applicable to the whole of mankind, that notwithstanding many variations caused by local and historical conditions, the general type of evolution is the same everywhere.

This theory has been discussed most clearly by Tylor, who finds proof for it in the sameness of customs and beliefs the world over. The typical similarity and the occurrence of certain customs in definite combinations are explained by him as due to their belonging to a certain stage in the development of civilization. They do not disappear suddenly, but persist for a time in the form of survivals. These are, therefore, wherever they occur, a proof that a lower stage of culture of which these customs are characteristic has been passed through.

Anthropology owes its very existence to the stimulus given by these scholars and to the conclusions reached by them. What had been a chaos of facts appeared now marshaled in orderly array, and the great steps in the slow advance from savagery to civilization were drawn for the first time with a firm hand. We can not overestimate the influence of the bold general-

izations made by these pioneers of modern anthropology. They applied with vigor and unswerving courage the new principles of historical evolution to all the phenomena of civilized life, and in doing so sowed the seeds of the anthropological spirit in the minds of historians and philosophers. Anthropology, which was hardly beginning to be a science, ceased at the same time to lose its character of being a single science, but became a method applicable to all the mental sciences and indispensable to all of them. We are still in the midst of this development. The sciences first to feel the influence of anthropological thought were those of law and religion. But it was not long before ethics, esthetics, literature and philosophy in general were led to accept the evolutionary standpoint in the particular form given to it by the early anthropologists.

The generalized view of the evolution of culture in all its different phases which is the final result of this method may be subjected to a further analysis regarding the psychic causes which bring about the regular sequence of the stages of culture. Owing to the abstract form of the results, this analysis must be deductive. It can not be an induction from empirical psychological data. In this fact lies one of the weaknesses of the method which led a number of anthropologists to a somewhat different statement of the problem. I mention here particularly Adolf Bastian and Georg Gerland. Both were impressed by the sameness of the fundamental traits of culture the world over. Bastian saw in their sameness an effect of the sameness of the human mind and terms these fundamental traits 'Elementargedanken,' declining all further consideration of their origin, since an inductive treatment of this problem is impossible. For him the essential problem of anthropology is the discovery of the elementary ideas, and in further pursuit of the inquiry, their modification under the influence of geographical environment. Gerland's views agree with those of Bastian in the emphasis laid upon the influence of geographical environment on the forms of culture. In place of the mystic elementary idea of Bastian, Gerland assumes that the elements found in many remote parts of the world are a common inheritance from an early stage of cultural development. It will be seen that in both these views the system of evolution plays a secondary part only, and that the main stress is laid on the causes which bring about modifications of the fundamental and identical traits. There is a close connection between this direction of anthropology and the old geographical school. Here the psychic and environmental relations remain amenable to inductive treatment, while, on the other hand, the fundamental hypotheses exclude the origin of the common traits from further investigation.

The subjective valuation which is characteristic of most evolutionary systems, was from the very beginning part and parcel of evolutionary anthropology. It is but natural that in the study of the history of culture our own civilization should become the standard, that the achievements of other times and other races should be measured by our own achievements. In no case is it more difficult to lay aside the 'Culturbrille'—to use Von den Steinen's apt term—than in viewing our own culture. For this reason the literature of anthropology abounds in attempts to define a number of stages of culture leading from simple forms to the present civilization, from savagery through barbarism to civilization, or from an assumed presavagery through the same stages to enlightenment.

The endeavor to establish a schematic line of evolution naturally led back to new attempts at classification in which each group bears a genetic relation to the other.

Such attempts have been made from both the cultural and the biological point of view.

It is necessary to speak here of one line of anthropological research that we have hitherto disregarded. I mean the linguistic method. The origin of language was one of the much discussed problems of the nineteeth century, and owing to its relation to the development of culture, it has a direct anthropological bearing. The intimate ties between language and ethnic psychology were expressed by no one more clearly than by Steinthal, who perceived that the form of thought is molded by the whole social environment of which language is part. Owing to the rapid change of language, the historical treatment of the linguistic problem had developed long before the historic aspect of the natural sciences was understood. The genetic relationship of languages was clearly recognized when the genetic relationship of species was hardly thought of. With the increasing knowledge of languages they were grouped according to common descent, and when no further relationship could be proved, a classification according to morphology was attempted. To the linguist whose whole attention is directed to the study of the expression of thought by language, language is the individuality of a people, and therefore a classification of languages must present itself to him as a classification of peoples. No other manifestation of the mental life of man can be classified so minutely and definitely as language. In none are the genetic relations more clearly established. It is only when no further genetic and morphological relationship can be found, that the linguist is compelled to coordinate languages and can give no further clue regarding their relationship and origin. No wonder, then, that this method was used to classify mankind, although in reality the linguist classified only languages. The result of the classification seems eminently satisfactory on account of its definiteness as compared with the results of biological and cultural classifications.

Meanwhile the methodical resources of biological or somatic anthropology had also developed and had enabled the investigator to make nicer distinctions between human types than he had been able to make. The landmark in the development of this branch of anthropology has been the introduction of the metric method, which owes its first strong development to Quetelet. A little later we shall have to refer to this subject again. For the present it may suffice to say that a clearer definition of the terms 'type' and 'variability' led to the application of the statistical method by means of which comparatively slight varieties can be distinguished satisfactorily. By the application of this method it soon became apparent that the races of man could be subdivided into types which were characteristic of definite geographical areas and of the people inhabiting them. The same misinterpretation developed here as was found among the linguists. As they identified language and people, so the anatomists identified somatic type and people and based their classifications of peoples wholly on their somatic characters.

The two principles were soon found to clash. Peoples genetically connected by language, or even the same in language, were found to be diverse in type, and people of the same type were found to be diverse in language. Furthermore, the results of classifications according to cultural groups disagreed with both the linguistic and the somatic classifications. In long and bitter controversies the representatives of these three directions of anthropological research contended for the correctness of their conclusions. This war of opinions was fought out particularly on the ground

of the so-called Aryan question, and only gradually did the fact come to be understood that each of these classifications is the reflection of a certain group of facts. The linguistic classification records the historical fates of languages and indirectly of the people speaking these languages; the somatic classification records the blood relationships of groups of people and thus traces another phase of their history; while the cultural classification records historical events of still another character, the diffusion of culture from one people to another and the absorption of one culture by another. Thus it became clear that the attempted classifications were expressions of historical data bearing upon the unwritten history of races and peoples, and recorded their descent, mixture of blood, changes of language and development of culture. Attempts at generalized classifications based on these methods can claim validity only for that group of phenomena to which the method applies. An agreement of their results, that is, original association between somatic type, language and culture, must not be expected. Thus the historical view of anthropology received support from the struggles between these three methods of classification.

We remarked before that the evolutionary method was based essentially on the observation of the sameness of cultural traits the world over. On the one hand, the sameness was assumed as proof of a regular, uniform evolution of culture. On the other hand, it was assumed to represent the elementary idea which arises by necessity in the mind of man and which can not be analyzed, or as the earliest surviving form of human thought.

The significance of these elementary ideas or universal traits of culture has been brought into prominence by the long continued controversy between the theory of their independent origin and that of their transmission from one part of the world to another. This struggle began even before the birth of modern anthropology, with the contest between Grimm's theory of the origin and history of myths and Benfey's proof of transmissions, which was based on his learned investigations into the literary history of tales. It is still in progress. On the one hand, there are investigators who would exclude the consideration of transmission altogether, who believe it to be unlikely and deem the alleged proof irrelevant, and who ascribe sameness of cultural traits wholly to the psychic unity of mankind and to the uniform reaction of the human mind upon the same stimulus. An extremist in this direction was the late Daniel G. Brinton. On the other hand, Friedrich Ratzel, whose recent loss we lament, inclined decidedly to the opinion that all sameness of cultural traits must be accounted for by transmission, no matter how far distant the regions in which they are found. In comparison with these two views the third one, which was mentioned before as represented by Gerland, namely, that such cultural traits are vestiges or survivals of the earliest stages of a generalized human culture, has found few supporters.

It is evident that this fundamental question can not be settled by the continued discussion of general facts, since the various explanations are logically equally probable. It requires actual investigation into the individual history of such customs to discover the causes of their present distribution.

Here is the place to mention the studies in folklore which have excited considerable interest in recent times and which must be considered a branch of anthropological research. Beginning with records of curious superstitions and customs and of popular tales, folklore has become the science of all the manifestations of popular life.

Folklorists occupy themselves primarily with the folklore of Europe and thus supplement the material collected by anthropologists in foreign lands. The theorists of folklore are also divided into the two camps of the adherents of the psychological theory and those of the historical theory. In England the former holds sway, while on the continent the historical theory seems to be gaining ground. The identity of the contents of folklore all over Europe seems to be an established fact. To the one party the occurrence of these forms of folklore seems to be due in part to psychic necessity, in part to the survival of earlier customs and beliefs. To the other party it seems to owe its origin to the spread of ideas over the whole continent which may, in part at least, be followed by literary evidence.

However this controversy, both in folklore and in anthropology, may be settled, it is clear that it must lead to detailed historical investigations, by means of which definite problems may be solved, and that it will furthermore lead to psychological researches into the conditions of transmission, adaptation and invention. Thus this controversy will carry us beyond the limits set by the theory of elementary ideas, and by that of a single system of evolution of civilization.

Another aspect of the theories here discussed deserves special mention. I mean the assumption of a 'folk psychology' (Völkerpsychologie) as distinct from individual psychology. Folk psychology deals with those psychic actions which take place in each individual as a social unit, and the psychology of the individual must be interpreted by the data of a social psychology, because each individual can think, feel and act only as a member of the social group to which he belongs. The growth of language and all ethnic phenomena have thus been treated from the point of view of a social psychology, and special attention has been given to the subconscious influences which sway crowds and masses of people, and to the processes of imitation. I mention Steinthal, Wundt, Baldwin, Tarde, Stoll, among the men who have devoted their energies to these and related problems. Notwithstanding their efforts, and those of a number of sociologists and geographers, the relation of 'folk psychology' to individual psychology has not been elucidated satisfactorily.

We will now turn to a consideration of the recent history of somatology. The historical point of view wrought deep changes also in this branch of anthropology. In place of classification the evolution of human types became the main object of investigation. The two questions of man's place in nature and of the evolution of human races and types came to the front. The morphological and embryological methods which had been developed by biologists were applied to the human species and the new endeavors were directed to the discovery of the predecessor of man, to his position in the animal series, and to evidences regarding the direction in which the species develops. I need mention only Huxley and Wiedersheim to characterize the trend of these researches.

In one respect, however, the study of the human species differs from that of the animal series. I stated before that the slight differences between types which are important to the anthropologist had led to the substitution of the metric quantitative description for the verbal or qualitative method. The study of the effects of natural selection, of environment, of heredity, as applied to man, made the elaboration of these methods a necessity. Our interest in slight differences is so much greater in man than in animals or plants, that here the needs of quantitative precision were first felt. We owe it to Francis Galton that the methods of the quantitative study of the

varieties of man have been developed and that the study has been extended from the field of anatomy over that of physiology and experimental psychology. His researches were extended and systematized by Karl Pearson, in whose hands the question which was originally one of the precise treatment of the biological problem of anthropology has outgrown its original limits and has become a general biological method for the study of the characteristics and of the development of varieties.

We may now summarize the fundamental problems which give to anthropology its present character. In the biological branch we have the problem of the morphological evolution of man and that of the development of varieties. Inseparable from these questions is also that of correlation between somatic and mental characters which has a practical as well as a theoretical interest. In psychological anthropology the important questions are the discovery of a system of the evolution of culture, the study of the modifications of simple general traits under the influence of different geographical and social conditions, the question of transmission and spontaneous origin, and that of folk psychology *versus* individual psychology. It will, of course, be understood that this enumeration is not exhaustive, but includes only some of the most important points of view that occupy the minds of investigators.

The work of those students who are engaged in gathering the material from which this history of mankind is to be built up is deeply influenced by these problems. It would be vain to attempt to give even the briefest review of what has been achieved by the modest collector of facts, how his efforts have covered the remotest parts of the world, how he has tried to uncover and interpret the remains left by the races of the past.

I think we may say, without injustice, that his work is directed principally to the explanation of special problems that derive their chief interest from a personal love for the particular question and an ardent desire to see its obscurity removed and to present its picture in clear outlines. Nevertheless the well trained and truly scientific observer will always be aware of the general relations of his special problem and will be influenced in his treatment of the special question by the general theoretical discussions of his times. It must be said with regret that the number of anthropological observers who have a sufficient understanding of the problems of the day is small. Still their number has increased considerably during the last twenty years and consequently a constant improvement in the reliability and thoroughness of the available observations may be noticed.

One or two aspects of the research work of the field anthropologist must be mentioned. The studies in prehistoric archæology have been given a lasting impulse by the discussions relating to the evolution of mankind and of human culture. Two great problems have occupied the attention of archæologists, the origin and first appearance of the human race, and the historical sequence of races and of types of culture. To the archæologist the determination of the chronological order is an important one. The determination of the geological period in which man appeared, the chronological relation of the earliest types of man to their later successors, the sequence of types of culture as determined by the artifacts of each period, and approximate determinations of the absolute time to which these remains belong are the fundamental problems with which archæology is concerned. The results obtained have the most immediate bearing upon the general question of the evolution of culture, since the ideal aim of archæology practically coincides with this general problem, the solution of which

would be contained in a knowledge of the chronological development of culture. Of course, in many cases the chronological question can not be answered and then the archæological observations simply rank with ethnological observations of primitive people.

The field work of ethnologists has been influenced in several directions by the theoretical discussions of anthropologists. We do not need to dwell on the fact that the scope of ethnological research has become more extensive and exhaustive by taking into consideration more thoroughly than before the whole range of cultural phenomena. More interesting than this is the stimulus that has been given to historic and psychological observation. On the one hand, the theory of transmission has induced investigators to trace the distribution and history of customs and beliefs with care so as to ascertain empirically whether they are spontaneous creations or whether they are borrowed and adapted. On the other hand, the psychic conditions that accompany various types of culture have received more careful attention.

These detailed archæological and ethnological studies have retroacted upon the theories of anthropology. The grand system of the evolution of culture, that is valid for all humanity, is losing much of its plausibility. In place of a simple line of evolution there appear a multiplicity of converging and diverging lines which it is difficult to bring under one system. Instead of uniformity the striking feature seems to be diversity. On the other hand, certain general psychic facts seem to become discernible, which promise to connect folk psychology with individual psychology. The trend of this development is familiar to us in the history of other sciences, such as geology and biology. The brilliant theories in which the whole range of problems of a science appears simple and easily explorable have always preceded the periods of steady empirical work which make necessary a complete revision of the original theories and lead through a period of uncertainty to a more strictly inductive attack of the ultimate problems. So it is with anthropology. Later than the older sciences, it has outgrown the systematizing period and is just now entering upon the empirical revision of its theories.

Our sketch of the history of the prevailing tendencies in anthropology would be incomplete without a few remarks on the men who have made it what it is. What has been said before shows clearly that there is hardly a science that is as varied in its methods as anthropology. Its problems have been approached by biologists, linguists, geographers, psychologists, historians and philosophers. Up to ten years ago we had no trained anthropologists, but students drifted into anthropological research from all the sciences that I have mentioned here and perhaps from others. With many it was the interest aroused by a special problem, not theoretical considerations, that decided their course. Others were attracted by a general interest in the evolution of mankind. The best among them were gradually permeated by the fundamental spirit of anthropological research, which consists in the appreciation of the necessity of studying all forms of human culture, because the variety of its forms alone can throw light upon the history of its development, past and future, and which deigns even the poorest tribe, the degraded criminal and the physical degenerate worthy of attentive study because the expressions of his mental life, no less than his physical appearance, may throw light upon the history of mankind.

Even now the multifarious origin of anthropology is reflected in the multiplicity of its methods. The historian or the political economist who comes into contact with

anthropological problems can not follow the methods of the biologist and of the linguist. Neither can the anthropologist of our period fill the demands for information of all those who may need anthropological data. It might almost seem that the versatility required of him will set a limit to his usefulness as a thorough scientist. However, the solution of this difficulty is not far off. We have seen that a great portion of the domain of anthropology has developed through the application of the new historical point of view to the mental sciences. To those who occupy themselves with this group of problems anthropological knowledge will be indispensable. Though the anthropological point of view may thus pervade the treatment of an older branch of science and help to develop new standpoints, the assistance that anthropology renders it does not destroy the independence of the older science which in a long history has developed its own aims and methods. Conscious of the invigorating influence of our point of view and of the grandeur of a single all-compassing science of man, enthusiastic anthropologists may proclaim the mastery of anthropology over older sciences that have achieved where we are still struggling with methods, that have built up noble structures where chaos reigns with us; the trend of development points in another direction, in the continuance of each science by itself, assisted where may be by anthropological methods. The practical demands of anthropology also demand a definition and restriction of its field of work rather than constant expansion.

The historical development of the work of anthropologists seems to single out clearly a domain of knowledge that heretofore has not been treated by any other science. It is the biological history of mankind in all its varieties; linguistics applied to people without written languages; the ethnology of people without historic records, and prehistoric archæology. It is true that these limits are constantly being overstepped, but the unbiased observer will recognize that in all other fields special knowledge is required which can not be supplied by general anthropology. The *general* problem of the evolution of mankind is being taken up now by the investigator of primitive tribes, now by the student of the history of civilization. We may still recognize in it the ultimate aim of anthropology in the wider sense of the term, but we must understand that it will be reached by cooperation between all the mental sciences and the efforts of the anthropologist.

The field of research that has been left for anthropology in the narrower sense of the term is, even as it is, almost too wide, and there are indications of its breaking up. The biological, linguistic and ethnologic-archæological methods are so distinct that on the whole the same man will not be equally proficient in all of them. The time is rapidly drawing near when the biological branch of anthropology will be finally separated from the rest and become a part of biology. This seems necessary, since all the problems relating to the effect of geographical and social environment and those relating to heredity are primarily of a biological character. Problems may be set by the general anthropologist. They will be solved by the biologist. Almost equally cogent are the reasons that urge on to a separation of the purely linguistic work from the ethnological work. I think the time is not far distant when anthropology pure and simple will deal with the customs and beliefs of the less civilized people only, and when linguistics and biology will continue and develop the work that we are doing now because no one else cares for it. Nevertheless, we must always demand that the anthropologist who carries on field research must be familiar with the principles

of these three methods, since all of them are needed for the investigation of his problems. No less must we demand that he has a firm grasp of the general results of the anthropological method as applied by various sciences. It alone will give his work that historic perspective which constitutes its higher scientific value.

A last word as to the value that the anthropological method is assuming in the general system of our culture and education. I do not wish to refer to its practical value to those who have to deal with foreign races or with national questions. Of greater educational importance is its power to make us understand the roots from which our civilization has sprung, that it impresses us with the relative value of all forms of culture, and thus serves as a check to an exaggerated valuation of the standpoint of our own period, which we are only too liable to consider the ultimate goal of human evolution, thus depriving ourselves of the benefits to be gained from the teachings of other cultures and hindering an objective criticism of our own work.

Franz Boas.

*PLANT MORPHOLOGY.**

Those who organized these congresses left to the guests whom they honored with their invitation a high degree of freedom in the handling of their subject. In the exercise of that freedom, which I gratefully acknowledge, I have decided not to attempt any general dissertation on the present position of plant morphology as a whole, but to discuss certain topics only in the morphology of plants, which at present take a prominent place in that branch of the science of botany. These center round the question of the relation of the axis to the leaf in vascular plants.

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We may, I think, date the foundation of a scientific comparative morphology of plants from the publication of the 'Vergleichende Untersuchungen' of Hofmeister, and his recognition of the fundamental homologies between mosses, ferns and other plants. But notwithstanding the soundness of Hofmeister's comparisons for the alternating generations as a whole, the homologies of the parts remained unsatisfactory; the chief reason for this was that their grouping was not derived from the comparison of nearly allied species; nor does it seem to have been held as important to consider critically whether such parts as were grouped together were or were not comparable as regards their descent. For long years after the publication of the 'Origin of Species' homology had no evolutionary significance in the practise of plant morphology. But in the sister science of zoology this matter was taken up by Ray Lankester, in 1870, in his paper 'On the Use of the Term Homology in Modern Zoology, and the Distinction Between Homogenetic and Homoplastic Agreements.' (Many botanists of the present day would be the better for a careful study of that essay.) He pointed out that the term homology, as then used by zoologists, belonged to the Platonic school, and involved reference to an ideal type. This meaning lay at the back of Goethe's theory of metamorphosis in plants, and it seems to have been somewhat in the same sense that homologies were traced by Hofmeister. Lankester showed that the zoologist's use of the term 'homologous' included various things; he suggested the introduction of a new word to define strict homology by descent; structures which are genetically related in so far as they have a single representative in a common ancestor, he styled 'homogeneous'; those which correspond in form, but are not genetically related, he termed 'homoplastic.'