and certainly never seeing an instrument in the lecture room. The advanced course is a theoretical discussion of the fundamental conceptions in psycholgy. The course is very difficult, but the fact that about one hundred advanced students take the course this year shows sufficiently how earnestly they feel the need, in our time—in which a thoughtless playing with psychology has become the fad of society—of discussing the principles of that science from a higher standpoint, and not only as a superficial introduction into experimental psychology.

Those who are interested in the details of the experimental work and want to follow it beyond the first elements which the lectures offered enter the training course in the laboratory, performing a prescribed set of individual experiments, working in groups of two. The question how far this training course ought to lead offers again methodological difficulties. We tried different schemes. My assistants gave last year two courses, the first training merely in well-known experiments, the second training in the scholarly attitude of the psychological investigator by carrying out some small investigations from which no gain for science was expected. This year we have dropped the second course and welcome every one, already after a-half year's elementary training course, to the regular original research work of the laboratory, in which, of course, everything is adapted to the effort to work towards the progress of science. We have come to this shorter circuit because with regard to the pedagogical value of original research work psychology has again quite an exceptional position; the self-observation factor, which stands in the way of the experimental work in the lecture room, becomes the greatest advantage for the psychological education in the research work. In physics or physiology you take the part of the investigator or you are outside; in psychology you can take a different part—you may be the investigator or the self-observing subject. And this subject part is, as every experiment is self-observation, in no way a less important and less scientific factor of the research, and yet it is still free from the administrative responsibilities of the investigator who carries on the experiment. To work for a time as subject in different investigations—every student of my laboratory takes part in at least three different investigations of different fields—is thus the very best bridge between the simple training course and the work which points towards publication and the Ph. D. My advice is thus to open the doors of the research laboratory rather earlier than the other exact sciences would wish to do; to work under constant supervision some time as subject seems to me even a better preparation than any special training course. The psychological seminary finally has to accompany this highest stage by advanced debates and papers; this work, in Professor James' hand, alternates in Harvard between more general questions and problems of abnormal psychology. The only defect which I must regret in this scheme is that we have so far no specialists for animal, child and social psychology. Child psychology finds a refuge in the department of pedagogy, social psychology in the department of sociology. They find in many universities to-day a very large amount of good will in both departments, but—and that is the last methodological principle which I wish to lay down—good will alone is also for psychological studies not always sufficient.

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ANTHROPOLOGY.

ANTHROPOLOGY is one of the subjects that have been added to the university curricu-

lum quite recently. For this reason I will devote my remarks to a consideration of the field that anthropological instruction is intended to cover and of its relations to allied sciences rather than to a discussion of methods of instruction.

According to purely theoretical definitions, anthropology is the science of man and might be understood to cover a vast range of subjects. The physical as well as the mental characters of man may be considered in a certain way as the proper field of anthropology. But sciences do not grow up according to definitions. They are the result of historical development. The subject-matter of anthropology has been accumulated principally by travellers who have made us acquainted with the people inhabiting distant countries. Another part of the subject-matter of anthropology is due to the investigation of prehistoric remains found in civilized countries. Only after certain methods had developed which were based largely on the information thus collected was the white race made the subject of investigation.

For this reason the aim of anthropology has been largely to explain the phenomena observed among tribes of foreign culture. These phenomena are naturally divided into three groups: (1) the physical appearance of man; (2) the language of man, and (3) the customs and beliefs of man. In this manner three branches of anthropology have developed: (1) somatology, or physical anthropology; (2) linguistics, and (3) ethnology. Up to this time anthropological investigation has dealt almost exclusively with subjects that may be classed under these three headings. These subjects are not taken up by any other branch of science, and in developing them anthropology fills a vacant place in the system of sciences.

The treatment of these three subjects requires close cooperation between anthropology and a number of sciences. The investigation of the physical characteristics of man has also been taken up by anatomists, but the point of view of the anatomist and that of the anthropologist are quite different. While the former is primarily interested in the occurrence of certain modifications of the human form and in their genetic interpretation, the anthropologist is interested in the geographical distribution of varieties of form, in the variability of the human species in different areas and in their interpretation. The thorough study of physical anthropology, or somatology, requires the combined training of the anatomist and of the anthropologist.

In the study of linguistics the anthropologist deals with a subject that has been partially taken up by the student of special linguistic stocks. The study of the structure of the Aryan languages, of the Semitic languages and of the Mongol languages has been carried on with great success by philologists; but the anthropological problem is a wider one—it deals with the general question of human language.

In the study of ethnology the field of investigation of the anthropologist adjoins that of the field of research of the psychologist and of the sociologist. The development of a truly empirical psychology makes it necessary to draw largely upon material furnished by anthropological studies. On the other hand, sociologists have found that the analysis of the culture of civilized society cannot be carried out successfully without a comparative study of primitive society, which is the subject-matter of anthropological research.

The method of anthropology is an inductive method, and the science must be placed side by side with the other inductive sciences. Our conclusions are based on comparisons between the forms of development of the human body, of human lan-

guage, of human activities, and must be as truly inductive as those of any other science. By including psychology and anthropology in the present discussion on the methods of teaching science, we have given expression to the conviction that the method of investigation of mental phenomena must be no less an inductive method than that of physical phenomena.

The teaching of anthropology may be made to supplement in many ways the teaching of allied subjects, and I will briefly outline its functions in the university curriculum.

Physical anthropology has come to be primarily a study of the varieties of man. The differences between different types of man, defined either geographically or socially, are slight—so slight, indeed, that the biologist, until quite recent times, would have disregarded them entirely. Slight differences in type have been of importance to the student of anthropology at an earlier time than to the student of zoology, because we are more deeply interested in the slight differences that occur in our own species than among animals. This has led to the result that in anthropology sooner than in zoology the insufficiency of description was felt. Anthropology was the first of the biological sciences to substitute measurement for description and the exact number for the vague word. The method of measuring variable phenomena—in the case of anthropology, of the variations composing a type—had to be developed. It is only natural that in the course of this development mistakes were committed which had to be rectified, and that the sound method of metric description developed slowly. It would seem that at present we have reached the stage where the methods of metric description may be clearly recognized, and we may, therefore, expect confidently a rapid and wholesome development of physical anthropology. A glance at recent biological literature shows very clearly that descriptive zoology and descriptive botany are passing at present to the substitution of metric description for verbal description that took place in anthropology some time ago. The study of anthropological methods may prevent biologists from repeating the same errors that were committed in the early days of anthropology. Anthropological subjects will, for a long time to come, remain the most available material for metrical studies of variations in the higher forms of life, because the material can be obtained in greater numbers and with greater ease than in studies of most of the higher animal forms. The metric method, which is at present principally an anthropological method, will, in a very short time, become of great importance to the student of biology, who ought, for this reason, to profit by the experiences of the anthropologist.

The fuller development of physical anthropology will lead to a study of the physiology and experimental psychology of the races of man. But in these lines of work we have hardly made a beginning. The relation of these inquiries to physiology and to psychology will be the same as that of physical anthropology to anatomy.

I may be allowed to pass by briefly the relations of the linguistic method of anthropology to other sciences. You will recognize at once that this subject, as well as its methods, must have a stimulating effect upon the teaching of philology, because its conclusions are based upon the broad grounds of human language; not on the studies of a single family of languages. The science of linguistics is growing slowly on account of its intrinsic difficulties. These difficulties are based as well on the lack of satisfactory material as on the amount of labor involved in the acquisition of knowledge in its particular line of research. Work in this field is most urgently needed,

because the languages of primitive man are disappearing rapidly, thus depriving us of valuable material for comparative study.

Ethnology, the last division of anthropology, covers a vast field. Its main object may be briefly described as the discovery of the laws governing the activities of the human mind, and also the reconstruction of the history of human culture and civilization. The methods applied by ethnologists are twofold. The investigation of the history of the culture of definite areas is carried on by means of geographical and of archæological methods. The methods are geographical in so far as the types inhabiting a country, their languages and their customs, are compared to those of neighboring tribes. They are archæological in so far as they deal with the prehistoric remains found in the country in question. In this case we apply inductive methods for the solution of historical questions. The investigation of the laws governing the growth of human culture is carried out by means of comparative methods, and is based on the results of the historical analysis referred to before. These laws are largely of a psychological nature. Their great value for the study of the human mind lies in the fact that the forms of thought which are the subject of investigation have grown up entirely outside of the conditions whice govern our own thoughts. They furnish, therefore, material for a truly comparative psychology. The results of the study of comparative linguistics form an important portion of this material, because the forms of thought find their clearest expressions in the forms of language.

It appears, from these brief statements of the scope and methods of anthropological research, that an acquaintance with the whole field is indispensable for the sociologist; that a knowledge of results and methods will be of advantage to the psychologist, and that the statistical method developed in physical anthropology will be very helpful to the student of biology. In a general way, a knowledge of the outlines of anthropology seems to be of educational value, particularly in so far as it broadens the historical views of the student, because it extends his view over cultures and civilizations that have grown up uninfluenced by our own. The advances made by our own race will appear to him in a truer light when he is able to compare them with the work done by other races, and if he understands how much our own civilization owes to the achievements of people who appear to be at present on a low level of culture. The methodological value of the teaching of anthropology lies in the fact that it shows the possibility of applying inductive methods to the study of social phenomena.

Franz Boas.

BOTANY.

There are some phases of botanical teaching that do not belong in the present discussion. University teaching, where selected, well-trained, devoted students pursue original investigation under the criticism and advice of great specialists, is excluded, for there is here no question of methods, but only of men. It represents the ideal relation of teacher to student, the true ideal for all botanical teaching. We have in this country some, but far too little of it. Again, college work proper, consisting in advanced thorough courses upon the practicum plan and in the investigation spirit, hardly belongs here. Such work has been stimulated by university example to a high degree of excellence, and in botany much of it is being done to-day in our colleges, a fact with an important bearing upon our present subject, for thus are being trained the teachers of the near future who are to elevate the teaching of the schools. But in the teaching of systematic elementary courses in botany, where these are not