Practical Work in School Geography

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elbow and the mouth of the Missouri River, to-day raise the cattle and sheep to supply the great slaughtering and packing industries at St. Louis and Kansas City.

These geographic forces are stable, persistent; they operate from day to day and from century to century. They constitute the soil in which empires are rooted, and they rise in the sap of the nation.

PRACTICAL WORK IN SCHOOL GEOGRAPHY*

BY R. H. WHITBECK

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NO line of development in modern education has been more remarkable than the growth of science teaching by the laboratory method. "Study things themselves; learn by first-hand experience," is a universally accepted principle. The general principle is established and the working out of the details is progressing rapidly. A decade of experimentation by practical teachers has yielded well-organized plans of work in chemistry, physics, and biology. Laboratory courses in these sciences have been outlined and are practiced with pretty general satisfaction. But what about geography? Certain it is that in this field matters are in an unsettled state, at least in America. There are people who question whether geography is really a science at all. There is lack of agreement as to what should be included under the term and what excluded. Any one who has attempted to define the scope of geography has found how elusive and elastic are its boundaries, and how numerous its ramifications into all other fields of knowledge.

Physical geography is accorded a place among the sciences, but it does not so readily lend itself to the laboratory treatment in schools as do chemistry or biology or even physics. In the very nature of the science, laboratory practice cannot form so large a part in the study of physical geography as it does in the other sciences named. In the broader field of general geography, this is even more largely true.

Glance down the table of contents of a school text-book. It is evident that geography treats of an almost endless list of places, activities, phenomena, and relations, scattered over the entire earth, and that most of these cannot be studied at first hand unless we travel over the entire earth. Deserts, mountains, oceans, glaciers, and a thousand

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more of the real things with which geography deals cannot be brought together for study in one place. Manifestly a very large part of a student's geographical knowledge must be gained at second hand unless he is able to travel extensively. Principles, processes, and type forms may usually be found illustrated near home. Particularly is this true of the physical side of the study, and also of the commercial. The meteorological phase of the subject is, of course, well suited to first-hand study in almost any school. Every locality furnishes opportunities for some outdoor studies and these opportunities should be used to the utmost. Such studies are the lifeblood of school geography.

Regarding indoor laboratory work in physical geography, one scarcely knows what to say. Very few schools indeed have achieved any notable success along this line. The laboratory manuals thus far produced are confessedly unsatisfactory, and each one differs radically from every other.

In the geography of the elementary school, systematic laboratory work is as yet unknown, but observation and experience are impressing upon us that there are forms of practical work which enrich our geography teaching and enhance its value. It is with these elementary exercises that this paper chiefly deals. For convenience we may classify the exercises as follows:

1. Manual exercises, including—
 - (a) Modeling in sand, clay, or pulp.
 - (b) Map making and ordinary map drawing.
 - (c) Making of special maps such as, for example, those showing productions, rainfall, or industries, including the filling in of printed outline maps.
 - (d) Graphic representation of important statistical facts, such as relative areas of countries, population of cities, exports, etc.
2. Observational exercises, including—
 - (a) Study of pictures; the use of the stereoscope and stereopticon.
 - (b) Study of relief models and contoured maps.
 - (c) Study of raw materials and their finished products.
 - (d) Indoor study of common rocks, soils, ores, etc.
 - (e) Visits to mills, quarries, markets, etc.
 - (f) Weather observations and records.
 - (g) Field trips chiefly for the study of natural forms and phenomena of a geographic character.

It is not to be hoped that all of the above will be emphasized in any one school. Such a condition would probably be worse than emphasizing none of them.

Sand molding has proved its worth in primary grades. A month ago I secured an expression of opinion from forty or more teachers from some twenty different states as to the value of the sand table. There was hearty agreement that its use is essential to clear teaching in the primary grades. Only a few of the teachers cared for the sand table beyond the fifth grade. Map modeling in pulp or putty by grammar-grade pupils may be worth while as an exercise in manual training, but not as an exercise in geography.

Map drawing, which formed so large a part of the geography work a generation ago, seems to have been largely crowded out of the modern grammar-school curriculum. The group of teachers referred to above were in general agreement that the expenditure of a large amount of time by the pupil on a single map, laboriously executed, is not profitable. But the rapid sketching of maps, done free hand by the pupil, was heartily endorsed by all. The outline maps sold by various publishers were generally approved by the teachers. These give correct outlines of states and countries in which the pupils, usually from memory, place cities, rivers, or mountains; shade areas of ample or scanty rainfall; indicate the industrial, farming, grazing, lumbering, or mining sections, the great trade routes,—in short, any of the larger facts in which *location* is a matter of importance.

The practice of graphic representation in geography is worthy of more attention than most teachers give it. Statistics are to be avoided in geography teaching; yet, to a small extent, they must enter. To teach the exact population of cities or the areas of states is manifestly unwise; yet, to know something of the relative areas of a few of the most important states and countries and the relative population of a few important cities is useful. The graphic representation of a few selected areas of states and countries by proportional squares often opens one's eyes to long-cherished errors which he gained by studying maps constructed upon different scales. How many Rhode Island boys realize that, if their own state be represented by a small square, more than 200 like squares are necessary to represent the area of Texas? It may be disappointing but it is also educative when a pupil who lives on the banks of the Hudson or Delaware draws a line of any convenient length to represent the length of his river, and then draws another in proportion to represent the

Mississippi-Missouri, and finds that it takes fourteen of the former placed end to end to equal the latter. A graphic representation would reveal to the pupils of New Jersey that if sixteen mountains as high as the highest in their state were placed on top of one another, the pile would scarcely equal Mount Everest in altitude. The value of graphic representation lies in the vividness of the impressions which are left on the mind by making these diagrams, and it should not be forgotten that the vividness of impressions diminishes as their number increases.

The second group of practical exercises may be termed observational. Most of them are studies of real things. Picture study is an imperfect substitute, but the substitution is often unavoidable. We cannot see the Alps or the Alhambra in America. I judge that enough pictures are used in teaching geography—perhaps too many. If the pupil is shown a great number of pictures rapidly, no clear mental pictures are retained.

My suggestion is :

First, a careful selection of a relatively small number of clear pictures which present truly *typical* scenes at home and abroad. Second, that these pictures be used for actual study, each picture being accompanied by a few written questions which shall direct the pupil's attention to the salient things in the picture.

Regarding the study of relief models and contoured maps little need be said. Teachers find them so generally lacking in the human and life elements that they do not appeal to younger children. Secondary and collegiate students may use them to marked advantage.

The study of raw materials of manufacture and their products in various stages of completion, and also the study of common rocks, ores, soils, etc., may or may not be highly profitable. It is a noticeable fact that when these objects are taken from the school collection and studied, interest soon lags. On the other hand, it is equally noticeable that if the specimens were collected by these pupils themselves, they are a genuine center of interest. They study them and talk about them eagerly. They may yawn over a lesson on specimens brought from the school museum, but be on the *qui vive* of interest over like specimens which they themselves have collected on a trip. In observational studies, interest is absolutely essential to good results; only the interested observer really sees what he looks at.

The last and most important phase of practical work in school geography is found in the visits to mills, quarries, markets, river

banks, falls, or anywhere else where the pupils may see with their own eyes the actual things and processes about which they are studying in geography. As a trip to Europe differs from the printed description of such a trip, so, in a general way, does field geography differ from book geography. Weather observations, systematically made and recorded, form the reasonable basis for elementary meteorological studies. These studies of things just as we find them is the most valuable kind of education. In large cities and with large classes, field trips are, of course, so difficult to provide for that most teachers do not undertake them. However, we found in the recent session of the Cornell Summer School of Geography that more than half of the teachers present make a practice of taking their classes on field trips or factory visits, and practically all of these teachers were from large cities. I asked a great many of them, "Do you really feel that these trips pay for the time and trouble involved?" and I received in all only one negative answer. But the fuller discussion of field work in geography is assigned to another, and I must not encroach.

I have used or seen used in the class room every exercise recommended above. I have faith in them. They are, however, means to an end and not an end in themselves. Their value in practical use will depend upon the clearness with which the teacher sees the end which she is really aiming at in using them; the definiteness of her purpose and plan; and her good sense in deciding what to use and what not to use.

SUMMARY

1. Scientific teaching calls for the first-hand study of things wherever possible—the laboratory method.
2. Physical geography lends itself to laboratory treatment, but not to the same extent as do some of the other sciences.
3. In general geography most of the facts must be gained by studying about things rather than by studying the things themselves.
4. The value of geographical study is increased by the use of available field and laboratory exercises. These are both manual and observational.
5. Map sketching and outline-map exercises by pupils are a valuable means of expressing and impressing geographical ideas and a convenient means by which the teacher may test the accuracy of the pupil's knowledge.
6. Graphic representation through diagrams aids in correcting faulty notions and in getting correct ideas where statistics are involved.

7. The systematic study of pictures is a profitable form of geographical work.

8. Relief models and contoured maps are better adapted to secondary and collegiate students than to elementary students.

9. The study of specimens of any kind is most satisfactory when the pupils collect the specimens which they study.

10. Field trips, whenever possible, are the most valuable form of all practical work in geography.

PHYSICAL GEOGRAPHY IN HIGH SCHOOLS*

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PHYSICAL geography, though in one sense as old as the hills themselves, has been looked upon and is still considered a comparatively new subject. It has a brief past, a period which was not formative and preparatory, but which rather represented a cycle of inactivity preceding renewed activity or revival. Its present we are in the midst of—a period also brief—characterized by activity and accomplishment such as should be characteristic of the youth of any life—characterized also undoubtedly by some of the mistakes which necessarily accompany experiment. Toward its future we are now looking forward, to be characterized, we hope, by increased activity and accomplishment, by steadiness and stability also. It is my purpose in the following paper to give very briefly an account of the past, the present, and of what we hope for in the future of physical geography in the high schools of our country. Twenty years ago physical geography was a subject which appeared in the curriculum of public and private schools as one to be pursued for a term of from sixteen to twenty weeks if so elected by the pupils themselves. These pupils had passed through the preliminary steps of political geography in the grammar schools, where the emphasis had probably been laid upon arbitrary memory efforts in the study of political and natural features, and now found themselves confronted with new and more difficult problems in their high-school geography.

To the standard text-book of that time (Guyot's) the modern physical geography owes much, and to it also, I believe, many of the more mature students and teachers of physical geography trace their first

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