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The Teaching of Physiography

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THE TEACHING OF PHYSIOGRAPHY

Physiography

It is quite unfortunate that a subject as valuable as physiography finds such a small patronage among our high school pupils. This is probably due partly to the fact that there is still a lack of agreement among teachers as to the content or classification of the subject. In some high schools physiography is required of all freshmen. Often it goes under the title of "general science" or "modern geography." The subject matter of physiography is now fairly well organized. Yet its content varies greatly in different high schools, depending largely upon the training of the teachers. Unfortunately there are comparatively few teachers, except in the larger school systems, who are at all adequately prepared to teach it.

There are still many problems to be encountered in teaching physiography in the average high school, such as the organization of the course, the securing of proper laboratory equipment, the necessary time element involved, and the selection of the proper text. Each of these offers a real problem for the teacher to face and work out if the course is to prove its real worth and receive proper patronage and consideration.

Every teacher of physiography should, first of all, realize that the subject should be so approached as to relate it in every possible way to local problems and thus catch and hold the interest of the pupils. With a well trained and resourceful teacher, even though the laboratory equipment is not first class nor the text book the best, all of the necessary "local color" may be worked in and the application side of the course made real and vital.

The selection of a text is not simple. As yet no first class text that has the distinction of being primarily for high school freshmen has been placed on the market. Most of the recent texts are too technical and too scientific to be readily adaptable to high school work. High school texts should show clearly the application of the principles of physiography to every day life. Since there is no satisfactory text, it might be preferable to have available in the library or in the class room, several texts to which the pupils might have access without purchasing any particular one. I would suggest the following texts as among the most practical: Elements of Geography by Salisbury, Barrows and Tower; Lessons in Physical Geography by Charles R. Dryer; New Physical Geography by Tarr and Von Engeln; Rocks and Minerals by Fairbanks; Physical Geography by Gilbert and Brigham; High School Geography by Whitbeck; College Geology, Part I by Chamberlin and Salisbury. These texts offer much that is valuable and within the comprehension of high school freshmen.

It is not necessary to have an elaborately equipped laboratory to teach physiography. Collections of the common rock making minerals and good samples of the great classes of rocks, as igneous, sedimentary, and metamorphic can in most cases be collected in the field by the teacher and pupils. If such specimens are not available in the surrounding region, they may be secured from Ward's Natural Science Establishment, 84-102 College Ave., Rochester, New York. Topographic maps illustrating all the major principles may be secured from the United States

Geological Survey, Washington, D.C., at very nominal prices. These maps should be selected with care and only those secured which show distinctly the various principles discussed. I would suggest maps illustrating the following: wind work, cycles of erosion, ages of valleys, river deposits, ground water, continental glaciation, mountain glaciation, vulcanism, shore lines, lakes, and topographic evidences of unequal erosion.

The most important single aid for vitalizing physiography is the laboratory and the field work. To do this work well requires more than the regular period of 45 minutes. The administrator should so organize the program that a double period is available. The laboratory should be a thorough check on the text book work and it needs most careful supervision to see that the pupil is not wasting time. In the field work there are serious problems for the teacher. He should first scout over the home region and discover good locations that will emphasize the physiographic principles discussed in class. A variety of locations are necessary as different phases of the subject are dealt with. The writer is sure that there are very few localities where illustrations of most of these principles cannot be found. If time is limited it might be possible to have the pupils excused from afternoon classes on two or three occasions during the semester. The value of the well planned, well organized field trip cannot be over estimated. Herein lies the teacher's great opportunity to gain and hold the interest of the pupil.

In one short article it is impossible to offer to teachers any extended suggestions for laboratory work. The value of topographic map work is inestimable. Each physiographic principle should be followed by a carefully planned lesson on the topographic maps to see if the pupils have the important facts well fixed in their minds. I suggest the following check-up exercise on wind work maps. The Geological Survey maps showing wind work are as follows:

Atlantic, N. J., Kinsley, Kan., Lakin, Kan., Larned, Kan., Moses Lake, Wash., Ocean City, Md., Pratt, Kan., Sandy Hook, N. J., and Toleston, Ind.

Prepare a tabulation with vertical and cross columns. In the left-hand marginal column write the names of the map sheets listed above. Enter the following headings for the vertical columns: sand dunes; depressions; shape; average height; length; location; source of sand. Then fill in the blanks.

E. J. CABLE

SIMPLE EXPERIMENTS TO SHOW ATMOSPHERIC PRESSURE

General Science

The teacher of general science in a small high school often lacks complete laboratory equipment, yet many experiments can be conducted with simple, inexpensive, and readily available material. For the demonstration of atmospheric pressure, try the following experiments:

1. Use a common glass tumbler completely filled with water. Cover it with a square piece of paper held in close contact with the water. Invert the tumbler quickly while holding the paper in position with the palm of the hand. Finally remove the hand from the paper. Let the pupils explain why the water remains in the tumbler.

2. Boil two tablespoonsful of water contained in a pint chemical flask, for about two minutes. Protect the flask from the flame with a square of wire screen. Remove the flask and quickly tie over its mouth a piece of sheet rubber, such as dentists use. Allow the flask to cool. The rubber will be forced down into the neck of the flask due to atmospheric pressure and will finally burst with a loud report. The purpose of boiling the water is to generate steam which drives out some of the air and a partial vacuum is created when the steam condenses. Encourage the class to explain the phenomenon.

3. Boil water in a flask as in (2). Immediately insert in the flask a one hole rubber stopper carrying a glass tube of any convenient length. Then invert the apparatus with the end of the glass tube dipping in a dish of water. As the flask cools the water will rush into the flask with a hissing noise. From this experiment the teacher can point out that at sea level the flask would have filled with water even if its height had been increased to approximately thirty-four