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THE FUNDAMENTAL AND THE INCIDENTAL IN GEOGRAPHY*

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THE subject matter of geography is almost limitless in amount. It is neither possible nor desirable to teach it all; a selection of material must be made. Of the matter selected to be taught, some is much more important than the rest. Some is fundamental; some is merely incidental. Exact agreement upon what is fundamental is not possible.

Geography belongs among those studies in which subject matter is the primary aim, and mental discipline is secondary. The study of geography will afford mental discipline. You can't help it. But in selecting what shall be emphasized, the guiding question, in my judgment, must be, "What parts of all this geographical material are most *useful* to the average person?"

There is a body of knowledge that ought to be a part of the life equipment of every intelligent man, and which it is the duty of geographical study to supply. No other study can be held responsible for furnishing this kind of intelligence. The vast majority of the children are to be the world's workers. They will not become learned men. My conviction is, then, that up to the end of the sixth school year, geography teaching should emphasize those things that are most likely to prove useful, later, to the rank and file of men; that the teaching should be strongly utilitarian; eminently sensible. To be more explicit: up to the end of the sixth school year, I believe map studies are fundamental, but I would not have the maps crowded with names,—a condition that complicates them and tends to leave in the mind indistinct pictures. There is value in simplified maps, studied and sketched, so that they fix themselves as permanent pictures in the mind. Upon those maps, only names which figure prominently and frequently in the reports of the world's affairs should appear. I have asked educated people to name the mountain ranges of South America. Most of these people, and they were well-read people too, could name just one range—the Andes. They could name five or six cities and about three rivers and possibly a half dozen important exports from South America to the United States. They had also a general idea that we sell manufactured goods to the South American states. Why do these people know so little about South America? They doubtless once learned in school the names of a dozen rivers, a half dozen mountain ranges, and a score or more of cities. It is simply because these

* A Paper read before the New Jersey State Teachers' Association at Atlantic City, Dec. 28, 1905.

geographical names figure so little in the affairs that interest the average man that they have forgotten them because of their sheer worthlessness.

A multitude of cities are mentioned and mapped in our school geographies. One modern text-book mentions 201 foreign cities which it calls "principal cities." Another gives 175 outside the United States, and 175 in the United States, and modestly heads the list "Some important cities." Still another book gives 275 cities in the United States and 310 foreign cities, or nearly 600 in all.

One of the new school geographies crowds its maps with place names. For example, it prints the names of 190 cities and towns on a map of France 3 by 4 inches in size. Not over ten of these are of much consequence to the average person.

Partly from interest in the experiment, and partly for the sake of any value that might come from the results of the effort, I undertook a little task in the Cornell Summer School of Geography of 1904. There were present some seventy-five geography teachers, principals, and superintendents, from twenty or more states; they represented all kinds of schools. These teachers were divided into committees, and each committee was asked to decide upon what cities in the continent assigned to it are of primary importance; cities that are so important that an American school teacher should teach their location rather accurately; teach why they are important, and for what they stand in world affairs. It was agreed that a city must stand for more than one important thing in order to be included in the list. Lyons, for example, though it is the leading silk-making city of the world, presents nothing else that an American school boy need know, and hence would not be included. The committees decided upon the lists of cities and passed them over to a committee of the faculty of geography. These men were Prof. Ralph S. Tarr of Cornell, Prof. Albert P. Brigham of Colgate University, Prof. Charles A. McMurry, the well known writer and lecturer on pedagogy, and instructors Philip Emerson of Lynn, Mass., Geo. A. Hubbard of Cornell, and Ray H. Whitbeck of Trenton, N. J. Two-thirds of the cities listed by the first committees failed of approval by the faculty committee. Any city in the United States which received two or more of the six faculty votes was listed. Following is the list; the numeral after a name signifies how many of the six votes this city received:

New York (6)
Chicago (6)
Philadelphia (6)
St. Louis (6)
Boston (6)
Baltimore (2)

Milwaukee (2)
Washington (6)
Denver (6)
Louisville (2)
Minneapolis-St. Paul (6)
Kansas City (2)

Cleveland (3)	Indianapolis (2)
Buffalo (3)	Duluth-Superior (5)
Pittsburg (6)	Salt Lake City (3)
San Francisco (6)	Puget Sound cities (4)
Cincinnati (2)	Scranton-Wilkes-Barré (3)
New Orleans (6)	Galveston (4)
	Lowell (3)
	(25)

No foreign city was listed unless it received the approval of at least three of the six members of the faculty. Following are the lists:

Europe

London (6)
 Liverpool-Manchester (6)
 Edinburgh (6)
 Glasgow (6)
 Madrid (4)
 Berlin (6)
 Hamburg (6)
 Vienna (4)
 Rome (6)
 Naples (3)
 Athens (6)
 Constantinople (6)
 St. Petersburg (6)
 Paris (6)
 Marseilles (3)
 Venice (4)
 (16)

Asia

Bombay (6)
 Calcutta (6)
 Canton (5)
 Peking-Tien-Tsin (6)
 Hong Kong (5)
 Jerusalem (6)
 Tokio-Yokohama (6)
 Mecca-Medina (3)
 (8)

Western Continent

Exclusive of U. S.

Montreal (6)
 Quebec (5)
 Rio Janeiro (6)
 Buenos Aires (6)
 Havana (6)
 Mexico (6)
 (6)

Africa, Australia, and Scattered Islands.

Cairo (5)
 Cape Town (5)
 Johannesburg (3)
 Melbourne (4)
 Sydney (3)
 Manila (6)
 Batavia (3)
 Honolulu (6)
 (8)

It is worthy of note that, while the text-books in geography mention upwards of 100 cities in Europe, only sixteen are regarded by this committee as deserving of emphasis and only eleven received the endorsement of the whole committee. The entire list contains only 57 cities; only 34 received the votes of the entire committee. It is understood, of course, that this

committee would expect pupils to be familiar with the names and approximate locations of probably twice as many more cities.

I took a list of 175 foreign cities, called in a modern school geography "Important," and pronounced them to various people who were kind enough to let me experiment upon them. A normal school senior just about to graduate with good standing could locate 30 per cent. of them, that is, could tell in what country they are found. A woman of educated tastes, a former school teacher, could locate 26 per cent. of them. A Princeton graduate with an A. B. (1903), now a teacher, succeeded in locating one-half of them.

Such an experiment may not prove anything, but it does suggest that more than half of these "important" cities do not figure enough in the reading of even well-educated people, so that these people can tell in what country they are located, much less tell anything more about them.

There is no authority able to dictate just what is fundamental and just what incidental. The individual teacher, supervisor, or superintendent must judge for himself. It is not all important that we agree upon just what is fundamental; it is of consequence that each teacher shall decide *what she will consider as fundamental* and then teach it so that it will stick. The amount of matter that will stand the test and prove itself to be fundamental is not great. The incidental matter is limitless, but such matter is not to be emphasized. Most of it will be forgotten, as it ought to be. A residuum will remain in the memory. Its survival will be the test of its fitness. *Its value will lie in its having been known.* There are only a dozen mountain ranges outside of the United States that need be remembered. About three rivers in South America, six in Europe, three in Africa, and six in Asia call for emphasis. A half dozen mountain peaks and as many capes outside of North America will prove, in life, to be worth remembering. Many other rivers, mountains, and capes will cross the path of the geography pupil in his study. He will, for the time, be on speaking terms with them. That is sufficient. They are only incidental. Long lists of exports, imports, and manufactures are mostly "lumber." We import a thousand kinds of merchandise, raw and manufactured. A few of these are really worth emphasizing, and only a few. Certain foreign places supply us with important articles; *e. g.*, rubber, tea, coffee, sugar, raw silk, wool, hemp, cocoa, hides, spices. Certain countries have specialized in certain manufactures, and excel in these lines; *e. g.*, English suitings and cutlery, French pottery and artistic fabrics, Bohemian and Venetian glass, Irish linen. In this matter of imports and exports there is need that teachers use the pruning knife and use it freely.

It was in the endless lists of places, rivers, islands, capitals, exports, imports, etc., that the old geography went astray. The new geography temporarily went astray in quite a different direction. It swung away to the other extreme, neglected political and commercial matters, and laid an absurd emphasis upon physiography. There were pages about primary highlands and secondary highlands; primary lowlands and secondary lowlands. It was dry stuff, and teachers and pupils soon rebelled against it; a saner geography is now with us. The physiographic basis of geography is right. I can not conceive of rational geography that is not based upon physiography; yet a sense of proportion must be maintained.

I have held that geography, up to the end of the sixth year, should aim primarily to give information useful to the rank and file of men. Beyond the sixth year, the controlling purpose will change. Facts for their own sake will receive less attention; general principles of geography, the idea of cause and effect—the “why”—will come into the foreground. They should have been present in all of the teaching; now they receive the emphasis. The judgment is called into service more, the memory less. This is as it should be. The early grades are the place to store the memory with facts, providing they are facts of value. The reasoning powers develop later.

Geography teaching should run through the grammar school course. Certain topics like the earth's movements and the results thereof, the effects of the inclination of the earth's axis; the light zones, the heat zones, the wind belts, call for accurate reasoning. They cannot be economically taught to immature minds. They probably ought to be taught in the grades; I sometimes doubt it. But certainly they should be left until the last year. I am aware that few courses of study conform to this notion. I question if the phenomena of the tides beyond the simplest facts, should be taught at all in the grades, particularly the cause of the tide on the side of the earth opposite the moon. I rarely find a teacher who understands this phenomenon, to say nothing of teaching it.

There are general principles of geography, just as there are of physics or chemistry. Some of them fall within the comprehension of grade pupils. These general principles, causes, consequences, and relations, are fundamental to later geography.

A few examples will illustrate the meaning of geographic principles:

The higher men rise in civilization, the more varied and numerous are their wants.

To gain profit from supplying these varied wants, men engage in farming, mining, fishing, lumbering, and all other forms of production, and in manufacturing and trading.

Because of differences in climate, soil, location, people, etc., different regions

are fitted to produce different things, and the exchange of these commodities forms commerce.

Living is easiest in a warm climate and hardest in a cold climate, but a temperate climate is most favorable to progress.

People are found in greatest numbers in regions of rich soil and easy travel, hence the rich valleys are most thickly populated.

Forests grow only where there is ample rain. General farming requires considerable rainfall or irrigation. Grazing is the chief industry in lands of small rainfall. (Mining?).

To make an industry profitable, men must be able to sell their products and deliver them where they are desired; hence means of transportation are demanded.

Where transportation facilities are best, all kinds of industries are most thriving.

Valleys and plains are natural routes for canals and railroads.

Manufacturing is especially dependent upon transportation, hence manufacturing and commercial cities grow up on navigable waters and at railroad centers.

A good climate, a good harbor, several lines of railroad, river or lake transportation, water power, nearness to coal mines, a rich surrounding country are the leading advantages of location.

A rising coast tends to produce an even shore line, without harbors. A sinking coast drowns the river mouths and produces harbors. Nearly all the good natural harbors of the world have resulted from the sinking of the land.

Geographical relations are fundamental matters, their importance increasing with the maturity of the pupil. For example, the great slaughtering and meat packing industry of Chicago, Kansas City and St. Louis, is a consequence of the corn fields of the Middle Western States and the grazing lands farther west. Corn is a response to the climate and soil of these states, and grazing is always the industry in regions of limited rainfall. The small rainfall of the grazing states results from their position on the leeward side of a mountain range. Hence, there appears the chain of relations between prevailing winds, mountains, rainfall, grazing, and slaughtering. These are cause-and-effect relations, and are easily perceived.

Again, Great Britain has coal and iron. They invite manufacturing. She is an island with many harbors. This develops seamanship. She desires to sell her manufactures and to secure food for her millions of workmen. This suggests colonies and Great Britain becomes the great colonial empire. Commerce requires ships, and she builds the greatest merchant marine in the world. A merchant marine and a colonial empire demand a navy to protect the commerce and the colonies, and Great Britain, of necessity, has the largest navy in the world. There is a close and evident relationship existing here, as there is among the larger facts in the geography of every country.

If my analysis is right, seventh and eighth year geography will lay the emphasis upon geographical influences and relations, geographical causes and

effects. Facts must still form a major part of the work, but the facts are made incidental to the geographical relations which are to be brought out. The earlier geography work was utilitarian. The later is educational or disciplinary to a larger extent.

The earlier teaching should be made definite by the teacher's selecting and listing the facts which she purposes to emphasize, and then seeing to it that the pupils appreciate that there is a difference between primary and secondary material.

The teaching of relations is harder to make definite. It is always easy to be indefinite. It is the expert teacher who can select from a maze of matter the salient points, emboss these points upon the background of her teaching so that they stand out like headlines; and when the details have all dwindled away in the distance, the essentials still stand out and refuse to be forgotten, because they were emphasized in a way that distinctly separated them from the thousand and one merely incidental facts of geography.

I have said nothing about field work. Without question, it is one of the most valuable means of teaching some phases of geography. Said Sir Archibald Geikie, the leading English geographer, "One hour's instruction in the field is, in fact, worth twenty hours of reading or listening to lectures." Said Colonel Parker, "Field lessons are an indispensable means in teaching geography." Practically every recognized leader in geography in America has committed himself to the same view. I shall not discuss the matter here. Suffice it to say that field lessons cost a good deal of planning, inconvenience, and strength, but they are worth what they cost.

To summarize:

Efficient geography teaching requires that as sharp a distinction as possible be made between matters that are really worth remembering and those that are not.

Memorizing facts is perfectly legitimate if the facts are worth memorizing.

Up to the end of the sixth year, the probable *usefulness* of material should be the test of what to emphasize in teaching.

The studying and sketching of maps to the end that clear mental pictures of these maps may be formed, is a fundamental exercise, especially in the 4th, 5th, and 6th years. Clear and simple maps are needed for school study.

Carefully selected lists of cities, rivers, mountains, exports, manufactures, etc., should be made and only the relatively few important ones should receive emphasis. Experience in life shows that these lists may be short without loss.

No authority can say exactly what is or is not fundamental. The important thing is that the teacher discriminate as wisely as she can, and lay the emphasis accordingly.

Many of the facts of mathematical geography are too difficult for immature minds and it is economy to teach them late in the course.

The earlier years of geography are the memory years: the later are the reasoning years.

In the seventh and eighth years, geographical relations and geographical principles should receive the emphasis.

Field work comes high, but it is worth all its costs.

There is a striking passage in Bagley's "The Educative Process." I want to put the word "geography" in place of his word "education" and quote the passage as my conclusion:

"What we need in geography (education) is something definite to tie to. If this something be accurate and exact, so much the better; if it can not be accurate and exact, let it approach this ideal as closely as possible, but in any case let it be definite."

WHITE MISTS AND BLACK CLOUDS.—Bouguer, of the expedition sent to Quito by the French Academy to measure a degree of latitude near the equator in 1736, wrote the following:—

P. xliii. "All the time we were crossing these mountains we couldn't help seeing the great error of the physicists who think clouds are not the same as mists. Often the clouds were five or six hundred fathoms below us and prevented us from seeing the earth, while they hid the sky from the inhabitants of the plains. At other times these clouds.....mounted higher and became a simple mist in which we were. When I have seen them well below us they always looked very white; I can only compare their form and color to masses of cotton that touched each other and had a wavy surface. As for the color, the same thing happens with water as with glass. It is well known that glass loses its transparency when pulverized and looks snow white from the side where it is strongly lighted. It is the same with water when reduced to very small particles or almost imperceptible drops in clouds or mist.....

"As the (drops)....present too many tiny surfaces to the light they seem dark when looked at from below, while if the spectator is placed above as we were often on Pinchincha and other mountains, all the rays reflected and intermingled after having suffered several refractions, form white in accordance with what we know of the nature of light."

M. S. W. J.