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THE MULTIPLICATION TABLES OF GEOGRAPHY

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THE subject has been couched in these terms with the intention of suggesting a possible parallelism between the formal work of the lower grades in arithmetic and that which we are to advance as a portion of the lower grade work in geography. The question for consideration, is, then; Is it not possible to turn to geographical account the ability to form in the lower grades lasting impressions through drill? Our belief that it is possible to do this will be expressed in this discussion in a consideration of the advisability of doing this formal work upon place geography in the lower grades. By lower grades, we will be understood to mean as early as the prevailing course of study has rendered the map and its symbols intelligible to the pupil.

Four phases of the question present themselves for consideration: (1) Why make place geography a point for special treatment, or of what worth is an accurate knowledge of place? (2) Why do it as early as possible in the grades? (3) What items of place geography shall be selected and made the basis of drill? (4) What means are useful and advisable in carrying out such drill? These phases will be taken up in order.

(1) An accurate knowledge of place geography has worth, in our opinion, since any training for adjustment in the sense of the ability to enjoy life demands a knowledge of place. It is demanded in order that the press reports may have meaning, which is dependent upon a knowledge of locality, and, to cite another instance, in order that the postmarks upon our mail may satisfy our mental inquiry of "Where from?"

In a more practical way, any training for adjustment in the sense of ability to control environment demands a definite knowledge of place. The choice between a letter and a telegram rests upon the knowledge of the length of time required, because of locality, to transmit the former. It is demanded in determining the route of a shipment, or in considering the advisability of buying at a distance.

Again, the recognition of the relation existing between man and natural resources and between natural resources and physical features, the relational or rational aspect of geography, is of large moment in aiding the appropriate adjustment of the individual to his environment. This recognition hinges upon a knowledge of place. For example, grazing is a fitting industry in the West, holding out inducements and possibilities of adjustments to the grazier, because of the mountains bounding the plain upon the west—these fundamentals being facts of place geography.

It is, perhaps, further indication of the worth of a knowledge of place

to note the large amount of attention which the extended lists of questions for map study in our texts have received and are still receiving—evidence of the belief in the fundamental character of this type of knowledge.

(2) In referring to the proper place in the grades for such drill work it will be helpful to mention a definite grade as the place of beginning. Our own course of study admits it in the fourth grade, and it is fair to presume that this will be typical for a great many schools. There appear to be clearly defined reasons why drill upon facts of place geography can be given here and also in the grade above with great profit.

Memory at this time is both prompt and tenacious. The period of youth from nine to thirteen has been termed the "golden age of memory," due in large part, no doubt, to the acquisition by the individual of the permanent teeth, and the completion of growth of the brain. The mind can now profitably be stored with facts of constant value, and it would seem good economics to do it now, when the return in lasting impressions would be large for the time invested, and when, owing to the delayed arrival of the rational ability, the relational phases of geography could not profitably be taken up.

Drill upon place geography at this time would afford a complete focus of the attention upon the *place* aspect, while, if the acquisition of place be left largely to the time when the location would appear a logical outcome of rational considerations, the focus is upon the relational element, and it is inevitable that the exactitude of place must suffer and give an uncertain nucleus for the associations of later life. In other words, it would seem better to fix the location of Chicago at a time when its exact location would be the all-important consideration than to attempt to fix it in a permanent way at the time when Chicago can be made to appear the only logical outcome of those conditions which have produced it.

Further, a large array of place facts under easy control would render the introduction to rational principles interesting and easy. Boston, Honolulu, Barcelona and Bombay, if fixed by map drill and reviewed in the later descriptive treatment, would furnish the familiar particulars in inducing the "break in transportation" principle? There would constantly appear the old element amid the new which would lend interest as is done when the familiar quotation appears in context or a friend is met in strange surroundings. Continuity is also added by this factor of reappearance of the old amid the new.

Drill, which alone can perfect the imagery upon which a definite knowledge of place geography depends, is not the irksome drudgery to a child in these grades which it becomes with the broadening interests of adolescence. In fact, children seem to find satisfaction in repeatedly doing the thing which has once been successfully accomplished. Repetition is natural, as is evidenced by the child's desire to have a story repeated in its original form, any innovation being unwelcome.

A further reason for giving the drill upon place geography early in the grades appears in the fact that the later consideration of the places drilled upon, in connection with the establishing of relations, furnishes a valuable review and a potent aid to memory through providing the associations which make for frequent recall.

(3) In replying to the question as to which item of place geography shall be selected and made the basis of drill, two principles appear to be suitable for our guidance though they may refer to groups of items which are not mutually exclusive. The first indicates the selection of those items which are useful to the individual in adjusting to his environment (with both enjoyment and practical advantage in mind) and of value in themselves. The second indicates the selection of those items (still with adjustment to and control of environment in mind) which are useful in contributing to the development of meaning or relations. The difference between the principles may be shown by use of the *Erzgebirge* of Germany. These mountains would scarcely be included because not likely to occur with sufficient frequency in the experience of an American to afford either satisfaction or practical benefit if definitely localized. They are of importance, however, in understanding the industries of an appreciable portion of Germany, in comprehending the adjustment of the German people to their environment, and so, in developing the concept suggested in this connection by "control and response."

These principles would readily be interpreted to mean that less work would be done upon the world as a whole than upon North America, less upon North America as a whole than upon the United States, and less upon the United States than upon the individual's own state. This would be the case because places near at hand are more apt to figure frequently in the individual's experience and so be more intimately related to his enjoyment and his practical adjustments. In general, the list of items in the place geography of any country should include the rivers, mountains, lakes, plains, plateaus, principal cities and water indentations. In order that these general statements may be rendered as definite as possible there are included here typical lists for Germany and Minnesota. For Germany, a list should embrace Hamburg, Bremen, Berlin, Elbe, Rhine, Danube, Bavarian Alps, *Erzgebirge*, the northern plain, the southern plateau and the boundaries. For Minnesota, if it be the individual's own state, the following: fifty cities (those usually included in the special state editions of our geographies are satisfactory); the counties; the state boundaries; Vermillion and Mesaba Ranges; Minnesota, St. Louis, Red and Mississippi rivers; the three watersheds; Lake Vermillion, Lake Itasca, Leech Lake, Upper and Lower Red Lakes, Lake Minnetonka and Mille Lac.

(4) The manner in which the work shall be done suggests both the distribution of the work in the grades and the manner of treatment from the standpoint of classroom procedure. As to the former of these considera-

tions, it may be done quite independently of the text and the work being pursued in it, but should be so divided between the fourth and fifth grades that the drill contemplated may be completed in these grades. In order, also, to provide the advantage mentioned of the "spiral" treatment, or the reappearance of the particulars drilled upon in later detailed work upon the countries involved, it is well to arrange the drill work to anticipate the course to be pursued. To illustrate, if the work as outlined for the fifth grade includes a study of South America, the drill upon the place geography of South America may properly be arranged for in the fourth grade, while the drill for the fifth grade may be upon those countries yet to be studied, of which Europe is presumably one.

The manner in which the work is to be done as a classroom exercise is dependent in large degree upon the ingenuity of the instructor in planning devices which supply satisfactory motives because of ends quite immediate of realization, and which further the primary object in such drill work, that of perfecting the imagery of the child for the map under study. Map drill of this character may well employ such means as the placing of symbols in outline maps, map drawing, bounding, modeling in sand and even in the more enduring mediums if the number of particulars to be fixed by such an extended piece of work would warrant the investment of time. Much rapid pointing by pupils with the map before the class lends itself to the creation of a game interest and proves a highly practical type of drill which may be often repeated. It is also useful toward the general aim mentioned above to leave the map suspended in sight of the class during the day, as it is undoubtedly true that images may be effectively impressed without conscious effort.

It is the writer's intention to subject the idea as sketched above to experiment as soon as a lapse of time has produced experimental conditions, permitting the comparison of results from pupils subjected to such drill with results from those who have gained a knowledge of place only as the various countries have been studied descriptively and with regard to relations. The soundness of the psychological principle involved is the excuse for presenting the idea before subjecting it to experiment.

HOW OLD IS THE EARTH?

IN a recently published book, *The Age of the Earth*,* Mr. Arthur Holmes (London) reviews the different serious attempts that have been made to answer this question. All of these attempts have one feature in common. The investigators select for their purpose some measurable change which is now taking place on the earth or within it, and endeavor to discover the time

*Harper and Brothers, New York and London, 1913; "Library of Living Thought" series.