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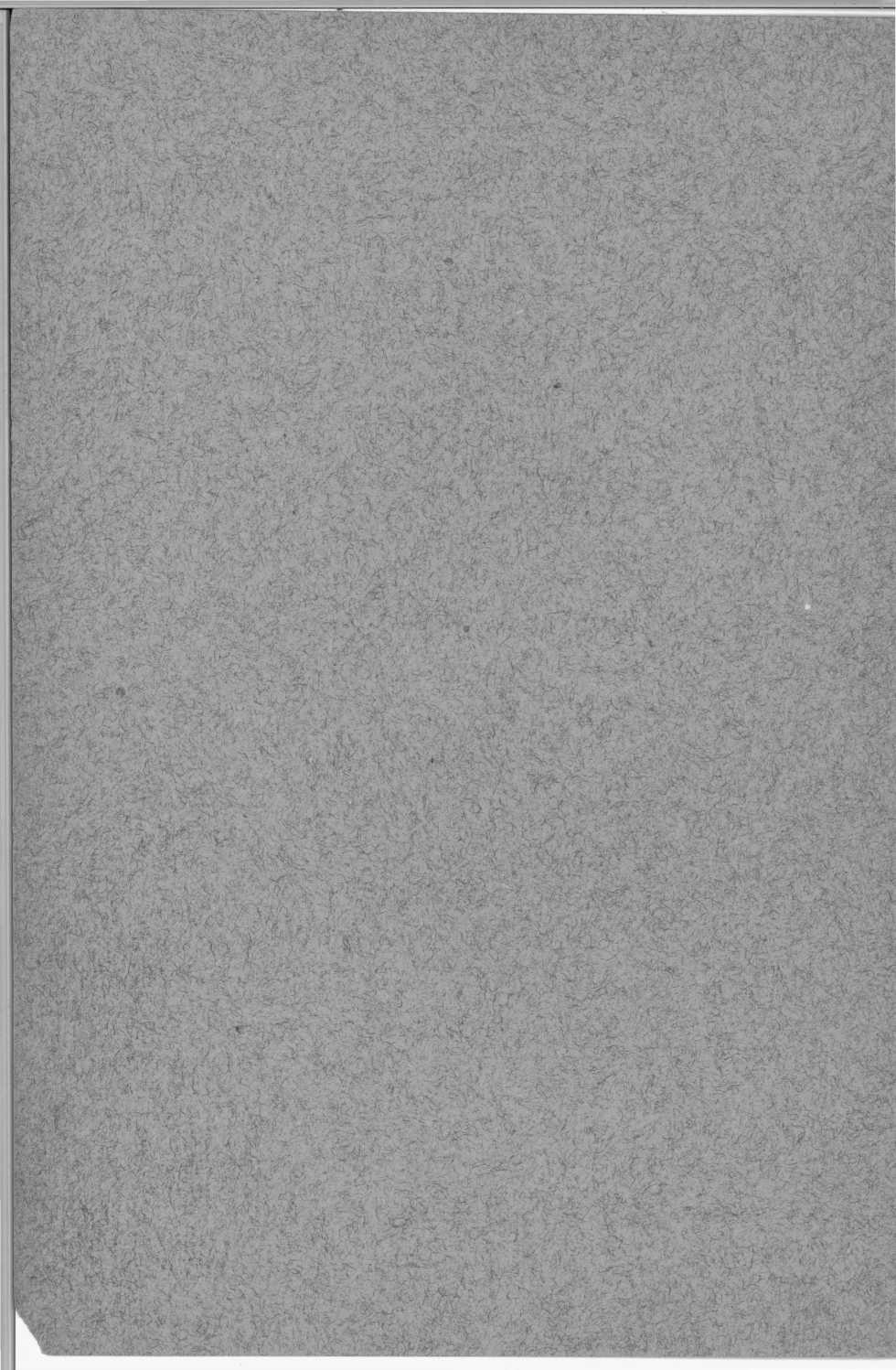


*SOME SUGGESTIONS FOR THE
TEACHING OF GEOGRAPHY
IN THE GRADES*

BY

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SOME SUGGESTIONS FOR THE TEACHING OF GEOGRAPHY IN THE GRADES.

By ANNIE L. WELLER, B. S.

With children as with older people it is usually true that facts as facts have far less interest than have facts with their causes and relations shown. Unless a child has been greatly repressed, we find him always asking the question, "Why?" If his curiosity is unsatisfied and he is always taught mere facts, he may reach the point where his curiosity about causes is either dormant or perhaps even entirely gone.

Geography as it was taught some years ago and as it is still taught in many schools was merely a means of cramming the child's memory with a mass of unrelated and, in most cases, unimportant facts, many of which may long since have ceased to be true. For instance, the pupil learned the capital, the boundaries, and the principal products of a country. That country was to him, in many cases, a certain part of a map which had a particular color. It had no relation to the world as he knew it. Perhaps within a few years the capital or the boundaries were changed. He had been given no

idea that geography is the result of evolution, that present conditions are the result of the working out of the effect from the cause. So far as he or anyone else can see, his study of geography has been of little use.

The products were perhaps the hardest thing to remember because there are so many combinations with but slight variation, and whether this combination belonged here or there it was difficult to tell. He had not been led to see that there might be a cause for the location of these products, or that each one had its definite set of necessary conditions in a broad region rather than in many separate ones.

That which is of educational value in such a study might better be had through learning any list of words having a definite order, for in that case there is no valuable subject from which life and interest are being taken away. The study was merely a training of the memory, and the higher faculty of reasoning did not enter into it.

As we look at the subject of geography today, it is a study of man and his environment and the control that each exercises over the other. The study has very little relation to the learning of a mass of facts. To be sure, some facts must be learned, but each, as it is presented, has back of it a reason for its being and is the effect which follows some cause. Almost the entire subject may be reasoned out by the pupil if the teacher has the knowledge which gives him power to direct the reasoning. At first glance, for instance, it would seem that the locating of the important cities of the world is merely memory work; but after some study we see that each has some reason for its location and for its development into a commercial center.

A very good exercise to bring out this idea with a class is to have before them on the blackboard or on a chart an outline map of a country, as, for instance, the United States, showing the surface relief, the principal lakes and rivers, and enough parallels to give in general the latitude of the country.

After a discussion with the class as to why cities exist and the reasons for their location, let them choose from the map such places as would be favorable for cities, if this were a new country just being settled. Then let the class discuss the growth of these cities and see if the reasons for their location will always cause them to become great. Then develop the idea that as the country becomes settled and its resources develop new reasons for growth of towns arise. This exercise will often arouse interest in the mind of the dullest member of the class, since even he may be able to solve his part of the problem. Such an exercise will help not only in the remembering of important cities but also in the locating of products and transportation lines, as well as of many other things which will suggest themselves to the individual teacher. As a review exercise this might be carried out in far greater detail.

Another exercise along this same line is a good one in which to bring out the relationships between history and geography and may also be used to advantage as a review lesson. Use the same map of the United States as mentioned before. Let the class think of themselves just coming from Europe as the first settlers to the new country. Let them decide, with the knowledge they have of the country, where they would make their first settlements and why. Or the teacher may suggest that the conditions be much the same as those which existed in the early history of the United States. Let them decide what their first industries would be, how these would be determined largely by the character of the region, and how new industries would be developed through specialization. Let them decide which settlements will become most important. As the number of people increases, there will be a tendency to increase the territory. In what direction would the people migrate and what would determine the lines of migration? It will easily be seen that they would follow the streams and that new towns would

grow up at such places as at the mouths of tributary streams or where falls or rapids interrupt the passage of a boat or cause a portage. The class will easily develop the country beyond the Appalachians by finding the easiest routes from the original settlements and will learn much about the surface features of the land as aids or barriers to its development.

This method of approach in geography will of course take considerable thought, study, and planning on the part of the teacher, but it will be found to add enough of interest for himself as well as for the pupils to repay him. The trouble in the past has been largely that the teacher himself has not recognized that there is any relation between the scattered bits of information he has made his pupils commit to memory; consequently it was a dead subject instead of a live and growing one.

The teacher of geography today has one of the best of opportunities to develop the thought power of his pupils, but unless he himself possesses a good knowledge of the foundation principles, he must fail. This knowledge he must get through a study of physiography, mathematical geography, and climatology, and the more thorough his knowledge, the better fitted he is to teach even the children of the lower grades. It is a common fallacy held in the minds of many that to teach little children one does not need to know very much, but in geography, as in other lines, it takes the wisdom that follows knowledge to make the teaching worth while. How, for instance, can anyone who knows nothing of the processes of nature teach children about the land forms as they should be presented in the subject of home geography? How can a teacher who has never himself learned to observe teach children to see the things in nature about them?

The teacher should have the land forms so well in mind himself that he can not only make word pictures of them,

but can sketch them upon the blackboard, or model them in sand. Many of the land forms,—such, for example, as those produced by water wear, with their processes of formation,—may be found almost anywhere, if only in miniature, and here the teacher in the rural school has often the advantage in that the thing he wishes to teach is usually better developed close at hand; but every roadside, even in town, after a shower or when the snow is melting in the spring, gives many an example of miniature river systems with divides, flood-plains, deltas, and the like. But even where the thing to be discussed is close at hand in nature, the power to sketch it on the blackboard is helpful in discussing it in class and in helping the children to observe carefully. Often the land form to be studied has around it so many other distracting things that it does not stand out clearly as an individual thing. This the sketch will remedy.

Through the study of things out of doors and the representations of them by picture, sketch and model, the child may gradually come to imagine how certain parts of the country, which he has not seen, look; and consequently they begin to mean more to him than the mere names or than their representation on an ordinary map in his own geography ever could have done. Soon he is able to put together the modeled country he has been imagining and the plain map of the same region, and he learns to think of either in terms of the other. After he has learned to read a map intelligently, the pupil is in a position to reason out conditions not yet given.

I have mentioned before the use of pictures. They are invaluable in geographic study and many good ones may be obtained at little or no expense. Most of the railroads of the country publish illustrated matter which will be sent on application. The railroad advertisements in the back of the monthly magazines are often suggestive. The Boston and Maine railroad publishes six booklets, each of which

contains some thirty or more very good pictures of New England scenery. These will be sent to anyone on the receipt of six cents for each booklet. The Northern Pacific railroad publishes each year a book called "Wonderland," which will be sent to any address on receipt of six cents for postage. For pictures of tropical scenes the Cuban Review and Bulletin, published monthly by the Munson Steamship Line, 82 to 92 Beaver St., New York, is very good and costs only fifty cents a year. For pictures of foreign countries the printed matter sent out by certain steamship lines is valuable. All such material helps to bring to the mind of the child a definite conception of the parts of the world that he has not seen.

To illustrate the idea of control of environmental conditions one over another and over the development of any region, I wish to take as a definite example the continent of South America. This, of course, in a short paper can be hardly more than a suggestion, not a detailed study. I choose South America for illustration, not because the sequence of effect upon cause is any more perfectly carried out than elsewhere, but because the structure of the continent is so simple that the conditions are less complicated than in most large land masses.

In the study of any country the teacher should always have in mind an outline for work. The outline given below suggests the principal points and may be worked out by the individual teacher, of course, in much greater detail.

I. Physical environment.

1. Location:

- a. With reference to latitude and longitude.
- b. With reference to other countries.
- c. With reference to water bodies.
- d. With reference to heat and wind belts.
- e. With reference to ocean currents.

2. Shape and size in comparison with other countries

already studied.

3. Surface features:

- a. Coasts.
- b. Highlands and lowlands.
- c. Direction of slope.
- d. Drainage systems.

4. Climate:

Winds, temperature, and moisture. How influenced by location, shape, and size of the country, and by surface features.

5. Natural resources:

- a. Vegetable.
- b. Animal.
- c. Mineral.

How dependent upon conditions given before.

II. Interaction between man and his environment.

1. Native inhabitants.

2. History of settlement. How influenced by physical environment.

3. Present inhabitants:

a. Industries:

1. Hunting and fishing.
2. Grazing and stock raising.
3. Lumbering.
4. Agriculture.
5. Mining.
6. Manufacturing.

b. Transportation and commerce:

1. Internal trade with routes.
2. External trade with routes.
3. Commercial centers with reasons for location

and growth.

c. Social organization:

1. Political.
2. Religious.
3. Educational.

d. Topics of local interest.

As before stated, some such outline should always be in the mind of the teacher, but it need not be always followed with exactness, since there may be danger of the form of the lessons becoming stereotyped. As an example of such variation as may be allowed, in studying the surface of a country it may seem the natural thing to bring up the effect of each land form upon the climate instead of waiting till all the surface features have been discussed before taking up the climate.

South America

The continent extends roughly from $12\frac{1}{2}$ degrees north of the equator to about 56 degrees south latitude and as the greatest breadth is to the north, the tropical type of climate is determined for a larger part of the country. The wind directions in the northern part necessarily vary with the shifting of the heat equator, while the southern part lies within the belt of prevailing westerlies. Bordered on all sides except the north by the great water bodies, the Atlantic and Pacific oceans, and on the north by the warm waters of the Caribbean sea, the wind directions of any particular place are largely responsible for its moisture conditions. In this instance ocean currents have no great influence, so we shall not stop to discuss them.

If we determine the shape of a country by drawing lines which show the general trend of the coasts, we find that South America is triangular and somewhat similar in form both to North America and to Africa, but quite unlike Eurasia or Australia. In area South America is about nine-tenths as large as North America and not quite twice the size of Europe. Its coasts are for the most part regular in outline, with very few indentations suitable for harbors. An exception to this regularity, however, is found on the west coast approximately south of the forty-second degree parallel. With

the exception of this one place there are very few islands which have any intimate connection with the structure of the continent.

The surface of the country, as in North America, is made up of a great central lowland composing the basins of the Plata, Amazon, and Orinoco rivers, and of a western and eastern highland. As in North America also, the western mountains are high and geologically young, while the eastern mountains are older, more worn down, and lower. The Andes mountains, or the western cordillera, are near to the coast all the way from the northern to the southern part of the continent. In the most massive part, which is just to the north of the tropic of Capricorn, the mountains are 500 miles in breadth. A bird's-eye view would show a great plateau from twelve to fourteen thousand feet in height. Rising above it and bordering it on each side we should see a complex system of ridges, mountain peaks, and volcanic cones. In the Bolivian portion alone there are thirty peaks, each with an elevation of over 17,000 feet. Here too we should see on the plateau, between two of the mountain ridges, lake Titicaca, with its area over three times that of our little state of Rhode Island, and with its many peninsulas and its mountain peaks standing up as islands.

To the north and south the cordillera become narrower, the range to the east disappears, and the number of high peaks becomes fewer; but nowhere in the whole length, which is about one-sixth of the circumference of the earth, is there to be found a pass over the mountains low enough to permit of easy passage from east to west. To the south the western chain of mountains becomes lower and lower until it disappears below the sea, leaving in the place where once there were mountains only a great number of islands. The land has sunk and the sea has come up into the old valleys, leaving only the higher points above the water.

To the north of the main mass, the narrowest part of the mountains is near the gulf of Guayaquil. From this place on through Equador the mountains seem to be almost entirely volcanic peaks, while the plateau becomes lower, more cut up by rivers, and finally disappears. In Colombia the cordillera again divide. The western chain is continuous through the Isthmus of Panama, while the eastern forms several ranges of which the most easterly continues along the coast to the east of Lake Maracaibo and disappears in the island of Trinidad just north of the delta of the Orinoco river.

In the eastern part of the continent there are two highland areas. The Guiana highlands have their western extremity to the south and east of the Orinoco river and from there trend to the southeast, then east, cutting off from the rest of the continent the Venezuelan, British, Dutch, and French Guianas. These highlands for the most part do not exceed 1,000 to 2,000 feet in elevation, but in Venezuelan Guiana they have not been well explored and some summits are said to reach 6,000 to 8,000 feet above sea level. Though so low, these uplands have formed a very effective barrier between the Guiana region and the Amazon basin and have prevented the development of Guiana to any great extent.

In the eastern part of Brazil from about the region of Cape St. Roque to the southwest, there is a plateau of from two to four thousand feet elevation. The Sao Francisco river in its upper course marks approximately the western border of the plateau, but in its lower course cuts through it almost at right angles. To the south and west the plateau characteristics become less prominent. The upland is cut up into low hilly ridges.

The main lowland of South America extends through the center of the continent. At the north where it composes the valley of the Orinoco, it is narrow, but after passing the low almost imperceptible divide which separates the Orinoco basin from the drainage area of the Amazon, the lowland widens

out to include the great Amazon basin. As the divide between this basin and the Plata is reached, the region again becomes narrower while its slope is to the southeast, as is shown by the direction of the flow of the streams. Lesser lowlands are found along the Pacific, Brazilian, and Guiana coasts and along the smaller rivers, such as the Magdalena, which flows into the Caribbean sea. On the Pacific coast the lowland is so narrow and the slope from the mountains so steep that there is no chance for any great river; but here, as along the other coasts, there are many unimportant streams, the number depending, as we shall see, upon the rainfall conditions.

Were the country all of the same altitude, it would not be difficult to divide South America into climatic regions with both temperature and rainfall as a basis. The equatorial belt would occupy its large share with its high temperature and heavy daily rainfall, while to the south there would be the temperate belt with its westerly winds and its rainfall decreasing to the east. Instead of this the differences in the elevation of the surface make a marked change, since they not only affect temperature conditions but also form barriers to moist winds and so change the distribution of moisture.

With conditions as they are, by using rainfall as a basis, we may divide South America into four regions by two lines, one from north to south, the other from east to west. The crest of the high Andes mountains forms the first division line, since if from any part of the Andes, with the possible exception of the section that is in the Doldrum belt, we could compare the region to the east with that to the west, we should be able to show a strong contrast.

The second division line would have approximately a southeast to northwest direction and would lie somewhere in the region of the thirtieth parallel. In the Andes we could subdivide the region definitely according to altitude, as here the

temperature, and with it the vegetation and animal life, depends upon that.

In the rainfall of the northern part of the continent, two important factors are at work: first, the ascending currents of air caused by the intense heating of the land in the hot zone; second, the trade winds which blow over the land from an easterly direction. The direction of these winds in this region, as before stated, vary with the time of year, following the change in the relation between the earth and the vertical rays of the sun. The region north of the equator will have two rainy seasons, since the Doldrum belt shifts from the equatorial region north to the Caribbean and back again during one year.

In the belt of calms, the Doldrums, the air becomes very much heated and this results in rising currents. As the air ascends, it expands, becomes cooled, and its moisture is precipitated. This process goes on without being much affected by the mountains, and throughout this belt we have the daily thunderstorms of the Amazon basin.

On each side of this hot belt is a region where the easterly winds come in over the land. Wherever the air is forced up by an upward slope of the land surface we again have cooling and regions of heavy rainfall. This process gives us the rainfall conditions on the east side of the Andes while to the west we find, as we should expect, desert or dryer country. Of course in these belts the ascending currents are somewhat effective, but the easterly winds are the great controlling force.

As we pass south to from $23\frac{1}{2}$ degrees to 30 degrees latitude we find a belt which divides our northern section from the southern. This belt has a northwest to southeast direction and is marked by the fact that here we have the region of sinking air with almost no rainfall. South of this is the zone of westerly winds. The air currents, in striking the west side of the mountains, are thrown upward and their

moisture is precipitated, while this same air going down the other side of the mountains becomes warmed and dry. Here we have the nearest approach to a continental climat found anywhere in South America.

Since the land mass in this southern part is so narrow, the temperature is somewhat equalized by the surrounding waters, but since the latitudes are comparatively high and the air moist, we find some small glaciers in the low mountains of the southern end of South America.

No other continent can in so small an area show such great and striking ranges in all climatic conditions and nearly the whole range may be found in the one narrow country of Chili.

Knowing the surface and rainfall conditions in South America it is easily seen why its largest rivers flow to the east and why the Amazon, one of the largest rivers in the world, is located in the north where there is not only a broad area to be drained but also a heavy rainfall.

A study of the vegetation conditions in South America shows remarkably well the influence of climate and land forms. In the mountain region the type of vegetation depends largely upon elevation, but in the lower countries the rainfall seems to be the controlling factor. Through the hot rainy region of the Amazon basin we find the tropical type of forest which is green the year round. This vegetation is very profuse. To the north and south this grades into the deciduous forest and the rich savanna, while these in turn change, with decrease in rainfall, to the southeast, into the steppes of the Argentine region.

The important animals of South America are for the most part domesticated, so that their present distribution depends upon the distribution of the human race; but the wild animals form groups which are closely associated with the plant groups.

The native inhabitants of South America were Indians of many tribes and types. Of these perhaps one of the best

known and strongest was the Inca tribe which inhabited the high plateaus of the central Andean region. Influenced by good climatic and soil conditions, as well as by the freedom and safety of their mountain country, this tribe seems to have been able to advance to a considerable degree of civilization, as did the Aztecs of Mexico. The other extreme type is seen in the poor region of Patagonia, where the natives have never, even today, advanced beyond the condition of barbarism. When the time of conquest by Europeans in South America came, the two tribes of natives were treated very differently. The Incas had to be either let alone or destroyed and, as Reclus says of them, "The Spaniards destroyed like a conqueror instead of creating like a master." On the other hand, the less advanced tribes seem to have been largely ignored. The native inhabitants around the borders of the continent have been greatly influenced by foreigners, chiefly Europeans and negroes, who have come into the country, but the interior is still largely held by the natives, since not only are means of transportation to the interior poor, but the climatic conditions do not agree with the foreigners.

As might be expected, the greatest density of population is found near the places which have access to good harbors on the one hand and resources on the other—as, for example, in the valley of the Plata river. Nowhere, however, does the density of population exceed, in any extended area, from ten to fifty a square mile.

In looking at so large an area as the one under discussion, we may profitably use only a few type illustrations to show the relations between climatic conditions and physiographic features on the one hand and the development of industries on the other. Each minor region will show its individual characteristics and so develop its own industrial condition. Of the industrial relationships, perhaps two of the best types are the coffee industry of Brazil and the ranching

with its allied industries in Argentine Republic.

Why has Brazil come to stand among the foremost of the coffee raising countries of the world? Simply because for perfection in coffee it has been found that there must be good soil, with a medium amount of rainfall, the summer temperature warm, but the winter temperature cool enough for an occasional frost, which will help to keep down the number of such animal forms as are injurious to the coffee plant, and land with an elevation of from two to three thousand feet. The nearest to the perfect combination of all these conditions is found in the plateau region of Brazil.

Why is Argentine Republic one of the great meat producing regions of the world? Again the question is answered in the climatic and surface conditions. The surface is level, the rainfall is slight. The type of vegetation in such a region is usually grass and the grass which grows here is rich feed for cattle and sheep and has the advantage of curing itself without being made into hay by man. The result is conditions best fitted for the wide range of cattle, the large ranch, not the small farm. Of course the development of refrigerator methods in transportation has been responsible for the market, therefore for a large part of the growth of the industry.

As would naturally follow from the conditions named, the commercial relations of these parts of South America with other countries depends upon these two industries and we find Brazil sending out as its greatest export from 10,000,000 to 16,000,000 bags of coffee (averaging 132 pounds each), yearly. *In the year 1900, of the 15,285,000 bags produced in the world, 10,500,000 bags, or 69 per cent., were produced by Brazil. †In Argentina over 2,500,000 sheep are slaughtered every year and the carcasses shipped frozen. These represent a value of about two million dollars in gold.

The minerals of South America, though very numerous both in amount and kinds and very widespread, have so far been

only slightly developed. In time they may come to be a great resource.

As we get a closer view of this great continent with its many rich resources, we begin to wonder why it is that, with a longer time even than North America for its development, there are still so few of its countries that stand as important in the commercial world. This is easily understood when we see how the Andes mountains act as barriers in the west, both to exploration and transportation. A country advances as its commerce grows, and commerce cannot grow without good harbors and good ways and means of transportation. Where these things are found there early grew up great cities which have been commercial centers as well as centers of culture. Here social organization, both political, religious and educational, has reached an advanced stage; but where the essential things are lacking, there we find a backward state of civilization.

Throughout the study of geography we find that the same principles hold as in South America and that each fact or condition is closely related to others. The climate depends upon location, shape, and size; the resources upon the past geological history and the present climatic conditions, while the distribution of man, his state of civilization, his history, his industries, his social organization, depend upon all of these things taken together.

* Trotter: Geography of Commerce.

† Monthly Summary of Commerce and Finance, August, 1901



