ECONOMIC AND SOCIAL GEOGRAPHY

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PREFACE

A CONTINUOUS thread of geographic reasoning runs through the whole of this book. It begins with a section on the major factors of geographic environment and the principles which govern their relation to plants, animals, and man. Climate naturally comes first because it is the most widespread, pervasive, and variable of the factors. Relief, however, is fully treated in relation not only to transportation but also to vegetation and human responses. Soils are treated equally fully; recent discoveries and personal observations in many lands have made it possible to set forth the principles which govern their world-wide distribution and influence with a logical completeness which has surprised the authors themselves.

Climate, relief, and soil are the main determinants of the geographic regions into which the earth's surface is naturally divided. Therefore the discussion of their influence in Part I prepares the way for the second section of the book. In Part II the earth's surface is divided into fifteen natural regions based primarily on man's use of the land. The descriptions of these regions in Part II provide a brief but comprehensive account of the earth as a whole, including not only climate, soil, and relief, but also vegetation, occupations, products, social conditions, and the distribution of population and cities. In order to concentrate the attention of the students on the geographic qualities of each region as a distinct unit the main products are merely mentioned in Part II, and their full discussion is postponed till later. Thus we come logically to Part III, which is devoted to the world's great products. Here all useful plants, animals, and minerals of any importance are discussed in respect to the geographic conditions governing both their production and use. This portion of the book has purposely been made encylopedic, but it differs from similar sections of most books in containing abundant discussions of general principles and world relationships. Since most products have to pass through a manufacturing process of some kind, and a great many are bought and sold, Part IV is devoted to industry and commerce. Here the outstanding feature is the separation of industries into great types based not only on raw materials, but also on the complexity of the industries and the

extent to which they produce goods or perform services for the local community as opposed to the outside world in general. In this section of the book, even more than in Part III, the vital differences between the various natural regions and the close relation between economic and social geography are strongly emphasized.

In the use of this book at least three methods are possible. First, the book may be used as a whole, thus providing a well rounded, full course in Economic Geography with enough Social Geography to give a clear idea of how these two phases of Human Geography are related. Second, by omitting the sections that are printed in smaller type a briefer course is possible. It covers the same ground as the other, but omits many detailed examples and minor products, or industries. Third, Parts I and II, with the omission perhaps of Chapter XI on Economic, Political, and Social Factors in Land Utilization, and the inclusion of Chapter XXIII on the Distribution of Four Great Types of Industry together with the introductory sections of the chapters on Minerals (XXI) and Fuels (XXII), provide a well balanced course in the main phases of Human Geography. In fact, Parts I and II consist largely of material which is needed as an introduction to any study of general geography, or of any phase of the subject where man is the dominant interest.

In addition to the general features thus far mentioned this book has the following special characteristics:

1. It goes further than most books in recognizing the fact that much of the importance of Economic Geography lies in its intimate relation to Social Geography.

2. It treats climate in a new way by means of climographs, a device which has proved very acceptable and illuminating to students wherever it has been intelligently tried.

3. It accepts the well established biological principle of climatic and other optima and applies this principle not only to plants and animals and to man's health and energy, but to manufacturing, commerce, and social progress as well.

4. It includes cyclonic storms and variability of rainfall among the climatic factors on which the natural regions are based, thus emphasizing the contrasts between the temperate regions of North America and Eurasia.

5. An historical approach to the problem of the distribution of manufacturing joins with the principle of optima to give a new and illuminating conception of the relative parts played by climate, mineral resources, racial character, and cultural development in guiding the distribution of industry.

6. The concept of the age and quality of soils is applied in a new way to the explanation of many phenomena in tropical countries.

7. The treatment of products is so complete that the book is in this respect a work of reference.

8. Illustrations of all sorts of phenomena are drawn in great numbers from the world as a whole as well as from North America. Hence an uncommonly large number of place names are used in such a way as to stimulate the student to look them up. thus giving him a wide familiarity with the map of the world.

9. In this book, as in its predecessor, *Business Geography*, pictures have been omitted (except in one case), and the space thus saved has been devoted to maps. Most of the maps are new, being the work of the authors, or of Miss Rebecca M. Taliaferro. Much gratitude is due Miss Taliaferro not only for her work on the maps but likewise for many valuable suggestions as to the text. It will be noted that most of the world maps use a new arrangement of the continents which eliminates the space usually wasted on the oceans. In order to facilitate comparisons of latitude, Professor Paule Goode's semi-homolosine equal-area projection with straight parallels has been used, with his kind permission, but the two Americas have been moved bodily eastward and Australia westward so as to give the maximum land areas with the minimum use of space on the page. The two other features of the maps are the use of the isopleth method in order to show the intensity of various phenomena, such as yield per acre, and the use of dots indicating percentages in order to show the amount of various phenomena, such as the manufacture of iron goods. Both kinds of maps are constructed in such a way as to be read with unusual ease.

Every class in Economic and Social Geography should have access to at least a few reference books, and should be made to use them constantly. It is especially desirable to give the students problems to solve and maps to make based on the abundant data in the statistical publications mentioned below under II and III. The authors recommend the following publications:

I. Atlases.

A commercial atlas. Those published by G. P. Putnam and Rand McNally are excellent.

A good general atlas. Those of Bartholomew, Johnson, The Times, Andree, Kiepert, and others are all excellent.

Geography of the World's Agriculture, V. C. Finch and O. E. Baker. Government Printing Office, Washington, D. C., 1917.

A small atlas purchased by each student. Those of J. P. Goode

(Rand McNally Co.) and the Oxford University Press are recommended. The latter, entitled *Oxford Economic Atlas*, is especially well fitted for use with this book and is frequently referred to.

Graphic Summary of American Agriculture Based Largely on the Census, O. E. Baker, U. S. Printing Office, Washington, 1931.

II. Statistical yearbooks to be renewed at least every two or three years.

The World Almanac and Book of Facts. The World, New York, yearly.

Statistical Yearbook of the League of Nations. League of Nations, Geneva, yearly. World Peace Foundation, Boston, Mass. This is the best of all publications for general statistics.

Commerce Yearbook. 2 vols. United States, and Foreign Countries. Department of Commerce, Washington, D. C., yearly. Indispensable.

Yearbook of Agriculture. Department of Agriculture, Washington, D. C., yearly.

Statistical Abstract of the United States. Government Printing Office, Washington, D. C., yearly.

The Statesman's Yearbook. Macmillan & Co., London, yearly.

International Yearbook of Agricultural Statistics. International Institute of Agriculture, Rome, Italy, yearly.

III. Statistical and other books to be renewed at intervals longer than two years.

The Economic Forces of the World. Dresdner Bank, Berlin. First issued in 1927, again in 1928 and in 1930.

The Salesman's Handbook, Curtis Publishing Co., Philadelphia.

Abstract of U. S. Census. Director of Census, Government Printing Office, Washington, D. C.

Yearbooks of as many foreign countries as possible.

IV. Periodicals.

Economic Geography. Clark University, Worcester, Mass.

Geographical Review. American Geographical Society, New York.

Journal of Geography. A. J. Nystrom Co., Chicago, Ill.

V. Other Reference Books.

A. General Reference Books.

Some good encylopedia (Britannica, International).

International Geography. Ed. by H. R. Mill. D. Appleton & Co., New York, 1900.

The New World, Isaiah Bowman. World Book Co., Yonkers-on-Hudson, N. Y., 1928.

B. Economic and Commercial Geographies.

Handbook of Commercial Geography, George G. Chisholm. Longmans, Green & Co., London, 1925.

An Introduction to Economic Geography, Wellington D. Jones and Derwent S. Whittlesey. University of Chicago Press, Chicago, Ill., 1925.

Industrial and Commercial Geography, J. Russell Smith. Henry Holt & Co., New York, 1925.

Economic Geography, R. H. Whitbeck and V. C. Finch. McGraw-Hill Book Co., New York, 1930.

Economic Geography, John McFarlane. Pitman & Sons, Bath, 1930.

Business Geography, Ellsworth Huntington and Frank E. Williams. John Wiley & Sons, New York, 1926.

C. General Geography and Its Principles.

College Geography, Earl C. Case and Daniel R. Bergsmark. John Wiley & Sons, New York, 1932.

An Introduction to Sociology. Ed. by Davis, Barnes, *et al.* D. C. Heath & Co., Boston. Revised 1931. (Social Aspects of Geography.)

Principles of Human Geography, Ellsworth Huntington and Sumner W. Cushing. John Wiley & Sons, New York, 1924.

The Character of Races, Ellsworth Huntington. Charles Scribner's Sons, New York, 1924.

Environmental Basis of Social Geography, C. C. Huntington and Fred A. Carlson. Prentice-Hall, New York, 1930.

College Geography, Roderick Peattie. Ginn & Co., Boston, 1932.

Environmental Basis of Society, F. Thomas. Century Publishing Co., New York, 1925.

The Geographic Factor, R. H. Whitbeck and O. J. Thomas. Century Co., New York, 1932.

Man's Adaptation of the Earth, P. W. Bryan. H. Holt & Co., New York, 1933.

D. Climate.

Civilization and Climate, Ellsworth Huntington. Yale University Press, New Haven, Conn., 1924.

The Climate of the Continents, G. W. Kendrew. Oxford University Press, American Branch, New York, 1921.

Climatology, A. Austin Miller. Methuen & Co., London, 1931.

Climate Considered Especially in Relation to Man, R. DeC. Ward. G. P. Putnam's Sons, New York, 1918.

Climates of the United States, R. DeC. Ward. Ginn & Co., Boston, 1925.

E. Regions.

Source Book for the Economic Geography of North America, Charles C. Colby. University of Chicago Press, Chicago, Ill., 1921.

Geography of North America, George J. Miller and Almon E. Parkins. John Wiley & Sons, New York, 1928.

North America. J. R. Smith. Harcourt, Brace & Co., New York, 1925.

North America, L. Rodwell Jones and P. W. Bryan. Lincoln MacVeagh, the Dial Press, New York, 1924.

Human Geography of the South, Rupert B. Vance, University of North Carolina Press, Chapel Hill, 1932.

South America, Clarence F. Jones. Henry Holt & Co., New York, 1930.

Economic Geography of South America, R. H. Whitbeck. McGraw-Hill Book Co., New York, 1931.

Industrial and Commercial South America, Annie S. Peck. Thomas Y. Crowell, New York, 1927.

Economic Geography of Europe, W. Blanchard and S. S. Visher. McGraw-Hill Book Co., New York, 1931.

Asia, Laurence Dudley Stamp. E. P. Dutton & Co., New York, 1929.

Japan's Economic Position, John E. Orchard. McGraw-Hill Book Co., New York, 1930.

West of the Pacific, Ellsworth Huntington. Charles Scribner's Sons, New York, 1925.

Australia, G. Taylor. Oxford University Press, New York, 1928.

Vegetation and Soils of Africa, C. F. Marbut and H. L. Schantz. National Research Council and American Geographical Society, 1923.

Oxford Survey of the British Empire, edited by A. J. Herbertson and O. J. R. Howarth, 6 vols., 1914.

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ECONOMIC AND SOCIAL GEOGRAPHY

PART I

MAJOR GEOGRAPHIC FACTORS AND PRINCIPLES

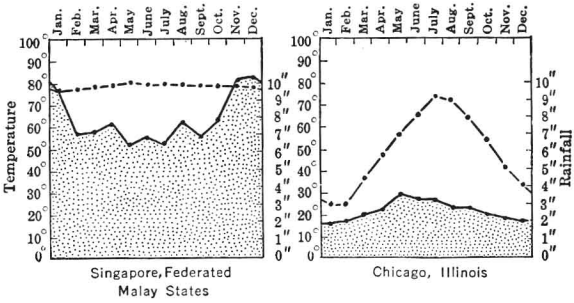
CHAPTER I

THE MEANING OF ECONOMIC GEOGRAPHY

A Problem in Economic Geography: Rubber Production.—Geography, like every other science, may be thought of as a series of problems. In solving the problems of the part of this science known as economic geography we need to distinguish between several sets of facts, each of which may work differently. The two most basic sets are, first, the purely physical, or, in a broad sense, the physiographic aspects of geography, and, second, the facts of economics. Other factors of a political, racial, and social nature also play a part and introduce all sorts of complications. Let us illustrate the matter by means of a specific problem, namely, the geographical relationships of rubber. We will consider primary production first, and then manufacturing and the social effect of the rubber industry.

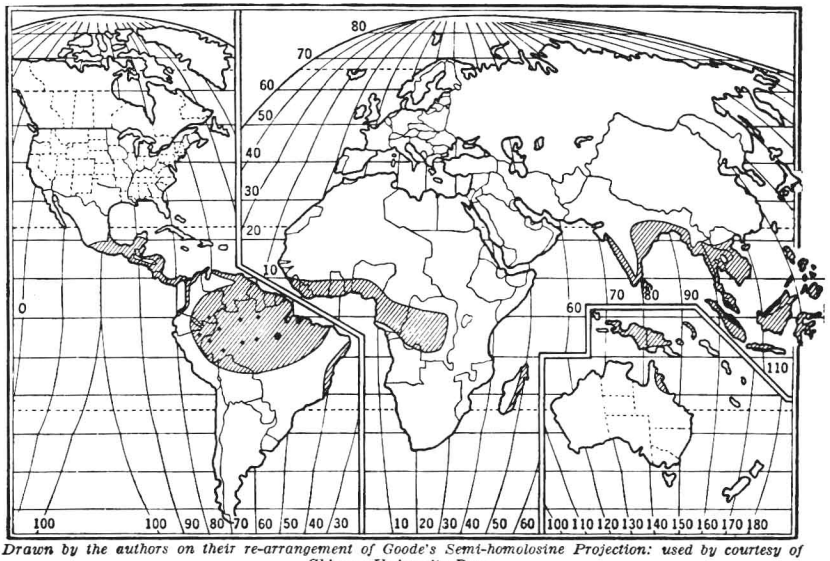
The Physiographic Factors. 1. *Climate.*—The word physiographic is often used merely for facts connected with the lands and their rocks, soils, and relief, but in a broader sense it means all parts of man's environment which are without life. Among these, climate has a wider effect than any other in determining where rubber shall be grown. Although rubber can be made from seventy or more varieties of plants, the genus *Hevea* has thus far proved the most useful. Hevea grows only where the climate is uniformly warm and wet. It prefers an average temperature close to 80° at all seasons and a rainfall of about 100 inches a year with no long periods of drought. It does not thrive where the average temperature falls below 70° for even a single month. It is greatly injured, too, if the rainfall drops below 2 or 3 inches per month for more than a month or two. A typical climate of this kind in com-

parison with that of Chicago is illustrated in A2.* Such climates are found only at low altitudes in the moister part of the lands near the



A—A Climate Suitable for Rubber Contrasted with That of Chicago.
(Shaded Areas Show Rainfall in Inches. Lines —.— Show Temperature in F.)

equator. Nevertheless there are several million square miles of land where the climate permits the growth of rubber, as appears in B2.



Drawn by the authors on their re-arrangement of Goode's Semi-homolosine Projection: used by courtesy of Chicago University Press.

B—World Map of Areas Climatically Suitable for Rubber (shaded), and of Areas where Rubber is Actually Produced (black)

* Throughout this book the illustrations are referred to by means of the numbers of the pages on which they are found. The letter A before a numeral means the first illustration on the page in question. B means the second illustration, etc.

2, 3. *Relief and Soil.*—Much of this great area where the climate permits rubber to thrive is rendered unfavorable for plantations by the relief of the land. One of the most important results of relief is its effect on the soil. In warm, wet tropical regions, such as those best adapted to rubber, the soil on moderate slopes is usually better than elsewhere. On such slopes the soil is very gradually washed away. Nevertheless, being held in place by the roots of the abundant vegetation, the soil disappears no faster than it is renewed by the decay of the underlying rock which thus forms fresh soil at the bottom of the old. Thus the rubber trees are able to grow in mature soil that is neither so young that its plant food is not yet easily soluble, nor so old that the plant food has mostly been leached away by the rain. Where such mature soils are derived from dark volcanic material, such as is common in Java, they are best of all. On the other hand, the hevea trees do not grow well in the new and immature soils of water-logged floodplains such as those in much of the Amazon Valley and along the coast of New Guinea. There the soil consists mainly of fresh material recently washed from the steep slopes of mountains. After it reaches the floodplains it is soaked with water so much of the time that it has little chance to decay and become oxidized by contact with the air. Thus even when it becomes old in years it may still be so immature that its potash, phosphates, and other valuable plant foods are not yet easily soluble. The tropical soils that have remained in the same position for very long periods on flat areas at higher levels than the floodplains are also very poor in many cases. Often they are red in color, a fact which frequently indicates that the warmth and wetness of the climate have caused them to decay rapidly and completely. In such "old" soils most of the plant food has been leached away by the frequent rains and only a poor skeleton of a soil is left, so to speak. Thus the relief of the land acting through the quality of the soil greatly reduces the areas that are favorable to the most rapid growth of rubber trees.

The relief also influences the location of rubber plantations in several other ways. Slopes surpass flat areas as sites for rubber plantations for at least four reasons. First, such slopes are well drained so that they are free from the danger of being water-logged during the frequent periods when heavy tropical showers pour down their water every afternoon for month after month. Second, wherever such slopes face toward the prevailing winds, they generally receive rain more regularly at all seasons than do flat areas, or slopes which face the other way. The prevailing winds in rubber areas are the steady trades, or in some cases the monsoons. Where such winds are obliged to move upward

over a slope they are likely to give up some rain even in the seasons which are otherwise dry. Thus on such slopes there is often rain at all seasons, which is very good for the hevea trees.

A third advantage of gentle slopes is that transportation is much easier on them than on steeper slopes or even on many of the flatter tropical plains where floods and swamps often cause much difficulty. In the fourth place, a gently sloping region is usually more healthful than a flat one. This is especially important when white men have to live in low latitudes, as they do on rubber plantations. But it is also important for the natives because they work far better when they are free from malaria and dysentery. Both diseases are likely to be worse in flat places where standing water harbors both the anopheles mosquito and the bacteria which cause dysentery.

4. *Location in Respect to Land and Sea.*—The areas devoted to rubber are mainly near the sea. Since white men generally have to live in the tropics in order to supervise the rubber plantations, it is essential that they take special care of their health. At the low altitudes where the climate is good for rubber, breezy locations near the sea are in general the most healthful. Then, too, the white people generally want to be near the sea in order to keep in touch with the rest of the world as much as possible. More important than this is the fact that rubber is never used in large quantities in the countries where it is raised. Therefore it must be shipped across the sea. Rubber has now become so cheap that it is fairly heavy in proportion to its value. So if it is carried far by land the cost of transportation eats up the profit. But transportation by water is cheap. Hence a location near a navigable waterway and within easy reach of a good seaport is especially valuable. Examples of such ports are found in Singapore, which serves the hilly peninsulas and islands of Malaysia and the East Indies, and in Pará, which serves the slopes that lie up the Amazon and its branches beyond the limits of the flat floodplain.

5. *Location in Respect to Main Trade Routes.*—Singapore today ships about two-thirds of all the world's rubber. This is partly because the city lies on the way from Europe not only to Japan, the most active country in Asia, but to about five hundred million other people in Indo-China, the East Indies, Australia, and China. Among the regions where the climate, soil, and relief are right for rubber there is no other place where ships pass at such frequent intervals. In actual mileage the eastern slopes of the Andes and the northwestern slopes of the highlands of Brazil are by no means so far from the United States and western Europe as are the Malay Peninsula and Sumatra. But no oecan ships come within hundreds of miles of these South American regions. Even

at Pará, some 500 to 2,000 miles from the best rubber country, the number of regular liners is very small. The number would not be great even if all the ships that go from North America and Europe to Brazil, Uruguay, and Argentina stopped at the mouth of the Amazon. These ships carry the trade of only about fifty million South Americans, in contrast with the trade of more than ten times as many Asiatics which passes through Singapore to and from Europe. But most of the liners from North America and Europe to South America do not stop at Pará. That city, unlike Singapore, lies off the main line of travel. It offers so little business that few ships are tempted to go there. Hence, in order to reach Pará promptly, Americans sometimes go to Europe, or even to Rio de Janeiro, and then back to the mouth of the Amazon. On the equatorial coasts of Africa, where there is also good rubber land, a similar infrequency of regular sailings is the rule. The reasons are the same as at Pará except that the active people with whom trade is carried on in the southern tip of Africa are even less numerous than the similar people in temperate South America. The interior portions of Africa that are fit for rubber are even more inaccessible than those of South America, as the falls and rapids of the Congo prevent that river from being a good waterway.

The location of the Malay region fosters the development of rubber plantations in still another way. The frequent visits of ships to Singapore mean that many people, especially Englishmen, are familiar with the place. We are all in danger of overestimating the advantages of places that we know and of underestimating those of unfamiliar places. Thus many people who are unwilling to have anything to do with South America or Africa invest their money in the Singapore region or even go there to live.

The Economic Factors. 1. *Demand.*—Economic conditions reinforce the physiographic conditions in still further reducing the area where rubber is profitably grown on plantations. The two sets of factors together reduce the area to a few black dots in B2, and even these have to be exaggerated to show plainly. The first of the economic factors is the demand for rubber. Tires, overshoes, clothing, insulation, and erasers are the chief products for which rubber is required. The amount that can be thus used is strictly limited. If too much land is planted with rubber, the price goes down, and it does not pay to produce a crop. That is what happened a few years ago when the price dropped from $1.05 a pound to only about 10 cents. Until some new use for rubber, such as for pavements in streets, increases the demand, economic conditions will hold the rubber areas to small size no matter how much land is physiographically available.

2. *Labor.*—Another powerful economic factor in determining the geographic distribution of rubber plantations is need of willing, patient, faithful, and inexpensive workers. The degree to which people have these qualities depends on race, training, climate, and health. In tropical South America the Indians are extremely poor workers. Moreover, there are so few of them that it is not easy to gather enough at any one place. The people of African descent in equatorial America and also the Africans in the part of their own continent that is fit for rubber are somewhat better, but still very inefficient, and not very numerous. On the other hand, the people of the Malay Peninsula and of parts of the East Indies like Java are numerous, and vie with those of continental India and Ceylon as the best of tropical workers. They are slow, to be sure, and we often think of them as lazy. Nevertheless, generations of labor, especially in the rice fields, have gradually eliminated the families where the men were unwilling or unable to work hard enough to supply food for their children as well as themselves. Then, too, Chinese immigrants who excel the tropical people in steadiness and intelligence are numerous in the Malay region. Thus the conditions of human efficiency provide strong reasons for locating rubber plantations in southeastern Asia and the East Indies rather than in tropical Africa, or in South America where the rubber tree was first found.

3. *Demand for Food versus Other Products.*—The need of using the good land for rice is another economic factor which influences the distribution of rubber plantations. In Java, for example, large areas of gently sloping land around the base of the many volcanoes are physiographically almost ideal for rubber. Yet they carry no plantations. The rubber raisers are found on the steeper, rainier, and more remote slopes of the south side of the island. The reason for this is economic. Although the Javanese farmers are among the best of tropical workers, they are very slow, as is natural in such a warm and monotonous climate. Moreover, since Java is the most densely populated country in the world, the farms are extremely small. They average only 3 acres in size, and many families get a living from only an acre or two. It is impossible for such people to raise much of a surplus over and above what they eat. Hence the island does not raise enough food to supply the needs of the small part of the population which is not at work on the farms. The two largest cities, Batavia in the west and Surabaya in the east, have a combined population of only 750,000. That is very few for an island with 40,000,000 people, or as many as the whole of France. Yet even these cities have to get food from outside. If good rice land were taken for rubber plantations, the necessity of depending on imported food would be still greater. Moreover, some of the farmers

would be thrown out of work, for an acre of rubber needs much less work than an acre of rice. Such economic conditions have caused the Dutch who govern Java to forbid the use of good rice land for rubber. Even if this were not so, the high price of the good land would drive the rubber planters into the rougher and more remote regions.

Political Factors.—The familiarity of Europeans with the route via Singapore is both a cause and a result of political conditions which have greatly influenced the distribution of rubber plantations. The main political condition is that the parts of the East Indies and of southeastern Asia which are best for rubber physiographically and in their labor supply are colonial possessions of Great Britain and Holland. This fact has weighed heavily in leading British subjects to establish rubber plantations near Singapore. So has the fact that until the World War the British had more money than any other people to invest in foreign enterprises. The Dutch, likewise, have long been familiar with the East Indies. Being also thrifty and having colonies there, they, too, have started many rubber plantations, especially in Sumatra. Turning to South America, we find that Henry Ford is right in thinking that climatically and in many other ways the regions along the Tapajos River in Brazil are almost as well fitted for rubber as is the Malay region. But his new rubber plantations are in a country which even in our day is subject to frequent revolutions. That fact alone would be enough to explain why such lands have not previously been developed, even if they were more accessible and had a better labor supply.

The Relation between Rubber Plantations and Manufacturing.—The requirements of manufacturing have had little effect on the location of rubber plantations. The process of hardening the sap into a form that can easily be transported is very simple. After the sap has been collected from the little cups into which it flows from the cut bark, it is smoked to prepare it for transportation. This simple kind of manufacturing requires very little equipment; wood for fuel is always abundant in any climate that is fit for rubber trees; and the number of skilled men needed to oversee the work is small. The later processes of manufacturing rubber are practically never carried on near the plantations. This is in harmony with the general fact that manufacturing of a highly skilled type is never found on a large scale in genuinely tropical countries. Moreover, such countries are relatively small consumers of highly manufactured goods. The Dutch East Indies, for example, have only one automobile or other kind of motor car for over 700 people whereas the United States has one for every five or less.

The greatest factor in determining where rubber is finally manufactured is human skill. A second factor is the extent to which the manu-

factured product will be used. The people who possess skill in manufacturing are essentially the same as those who can afford to use the manufactured products. Hence the manufacturing of rubber into tires and other finished products is almost wholly confined to western Europe, the United States, and other English-speaking parts of the world. We shall see later that this distribution follows very definite geographic laws. For the present it is enough to point out that human efficiency is the main factor in determining where rubber is manufactured as well as where it is raised. But the degree of efficiency required for the two things is very different.

The Relation of Social Conditions to the Economic Geography of Rubber. 1. *Growth of the Use of Rubber.*—Since the discovery of America, rubber has passed from a position of negligible importance to one where it has much to do with great social changes. Columbus found the Indian children of northern South America bouncing rubber balls, as generations of our children have bounced them. In later times, rubber erasers have helped school children, authors, draftsmen, and artists, and thus aided in the growth of modern civilization. About the middle of the last century, rubber overshoes and then rubber raincoats were among the early aids in the wonderful reduction of the death rate which has marked our times. These uses of rubber awakened enough interest so that about 1880 a few attempts were made to establish plantations in the Malay region. Then bicyles and carriages began to be fitted with rubber tires, and about 1900 the automobile became important. During the next ten years the demand for rubber increased far faster than the supply, and the plantation price of crude rubber soared to a dollar a pound in 1910 (A9). This led to two pronounced social changes. It precipitated a terrible crisis in the rubber regions of Latin America, especially on the Amazon and its tributaries. It also led to the very rapid expansion of plantations in the Malay region of Asia and thus greatly altered the conditions of life in that region.

2. *Social Results of the Search for Wild Rubber.*—Until 1910, practically all the world's rubber was gathered by Indians from wild rubber trees in the Amazon Basin and other parts of tropical America. This gave the Indians a little ready money. It also supported some Portuguese-American traders who established little stores and rubber warehouses in high, dry locations along the banks of the slow equatorial rivers. In tropical forests the trees of one kind do not grow in groves like our maples, pines, oaks, and birches; each kind is widely scattered, with one tree here and another there among dozens of other kinds. Hence in order to find rubber trees the Indians had to wander widely. Often they climbed some high tree, located whatever rubber trees might