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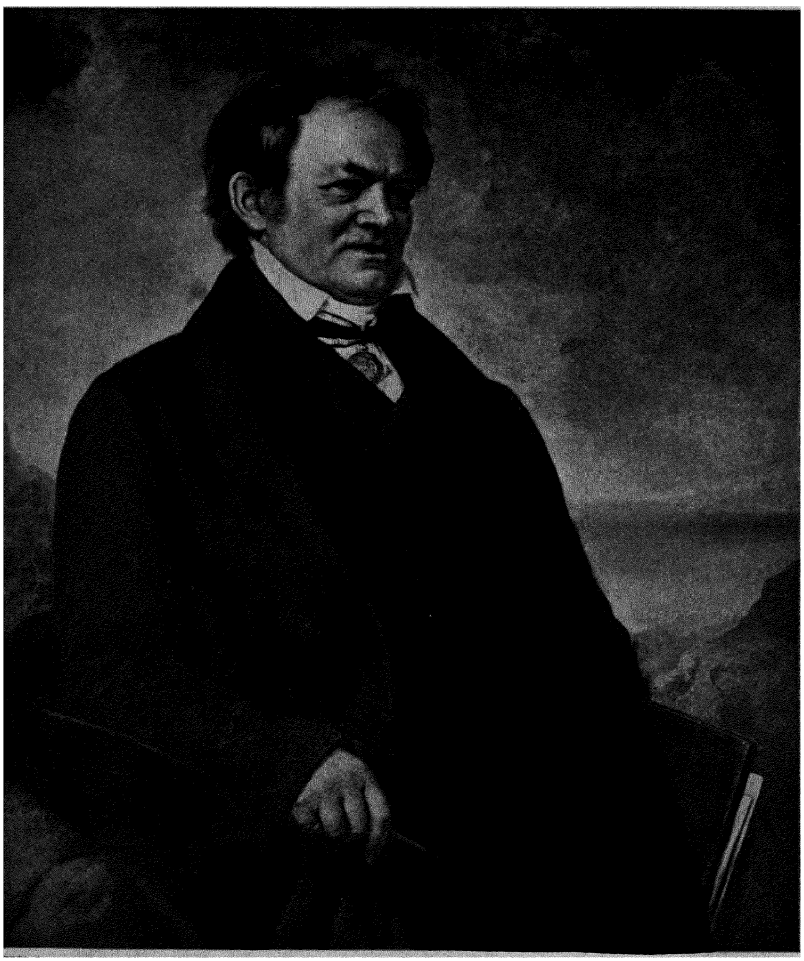
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THE ENVIRONMENTAL BASIS OF SOCIETY



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THE ENVIRONMENTAL BASIS OF SOCIETY

A STUDY IN THE HISTORY OF SOCIOLOGICAL THEORY

BY

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PREFACE

The purpose of this study is to present, in their appropriate historical and cultural settings, theories which attempt to explain the phenomena of individual and social life in terms of the geographic environment. It is not a study of environmental influences but of theories, ancient and modern, which deal with these influences. In a later chapter some of the more important criticisms of environmental doctrines are presented and evaluated, but the fundamental aim of the study is accurately to expound the doctrines rather than to pass judgment upon their scientific validity. While a strictly chronological mode of presentation would have had several advantages, the writer believes that the topical arrangement will be more serviceable for students of social and political theory.

The writer takes this opportunity to acknowledge his indebtedness to a number of friends and associates whose advice and suggestions have been of inestimable value. The work was undertaken at the suggestion of Professor A. A. Tenney, who has read the entire manuscript and has given the writer the benefit of many helpful and discriminating criticisms. To Professor H. E. Barnes he is indebted for an authoritative appraisal of the historical sources drawn upon, and for his generous interest in suggesting additional authorities. Professor Frank A. Ross, Mr. H. N. Shenton and Mr. R. G. Smith have offered a number of constructive suggestions, and Professor Kim-

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Finally, and above all, the author owes to Professor Franklin H. Giddings his interest in the study of society and therefore whatever of merit this little book may contain.

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THE ENVIRONMENTAL BASIS OF SOCIETY

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CHAPTER I

THE IMPORTANCE OF ENVIRONMENTAL THEORY FOR SOCIAL SCIENCE

SOCIAL causation is the scientific description and evaluation of all the factors which condition and determine the collective life of man, and a complete causal explanation of human society would take cognizance of historical, biological, psychological and geographical conditions and determinants.[1] The present study, however, is avowedly limited to a consideration of the geographical factor in social causation. It aims not to formulate any original theory of geographic influences, but simply to present systematically the major contributions to the subject, and to indicate, to some extent at least, the merits and defects of these contributions. A brief summary of the significance of environmental theories for social science, as recognized and evaluated by leading students in its various branches, will serve as an introduction to the study.

It would be difficult to exaggerate the importance of environmental theory for the study and interpretation of his-

[1] This has been recognized in Professor Giddings' monograph, *A Theory of Social Causation.*

tory. The notion that geography influences the course of history did not originate with Huntington, nor Buckle, nor even with Montesquieu. Historians of all ages have been aware of the very close relation between the two fields.[2] Many of them have made large use of the contributions of the students of anthropogeography and not a few have made noteworthy contributions to that science.

Evidence of an awareness of geographic influences is found in the writings of such historians as Herodotus, Thucydides and Polybius in the ancient period, of Paul the Deacon and Ibn Khaldun in medieval times, and in numerous works of more recent origin. The general effect of the physical environment upon history is discussed at length by H. T. Buckle in his *History of Civilization in England;* by F. Hellwald in his *History of Civilization in its Natural Development;* and by H. B. George in *The Relations of Geography and History,* among others. The subject has been considered also by James Bryce in his *American Commonwealth;* by Nathaniel S. Shaler in his *Nature and Man in America;* and by Ellen C. Semple in her *American History and its Geographical Conditions.* The geographic background of the period of the colonization of America has been analyzed by E. J. Payne in his *History of the New World Called America;* and A. B. Hulbert in his *Historic Highways of America* has made clear the influence of the mountain gaps and natural waterways upon the early history of the middle west.[3] Moreover, of the writers discussed as important contributors

[2] Cf. H. E. Barnes, "The Relation of Geography to the Writing and Interpretation of History," in *The Journal of Geography,* December 1921, Vol. XX, p. 321.

[3] H. E. Barnes, loc. cit.

to the science of anthropogeography in the chapters which follow, a considerable number like Ritter, Ratzel and Buckle, were professional students of history.

The importance of environmental doctrine for biological sociology has varied considerably with the successive developments of biological theory. When the evolutionary ideas of Lamarck, Spencer, Darwin and Haeckel enjoyed their vogue in the latter part of the nineteenth century, the relation of the environment to the development of both the individual and the race was regarded as all-essential. The individual and the race were looked upon as products of the reaction of an organism to its physical environment. Characteristics acquired by an organism in a given environment were thought to be transmitted through biological heredity. In the course of a number of generations their cumulative effect would become sufficient to produce a variation of type. The environment was thus regarded as the vital influence in variation, and its limitations created that struggle for existence which was held to be the chief factor in organic evolution.[4] The organicists, including Schaeffle, Lilienfeld and Worms, in constructing their biological analogies, also assigned great importance to geographic influences on social processes and institutions.[5] The now generally accepted view of Weismann that acquired characteristics are not inherited, together with the special views of De Vries and Mendel upon heredity, have very materially reduced the prestige of theories emphasizing the direct effect of the environment upon heredity. The biological analogies, as applied to social

[4] See L. M. Bristol, *Social Adaptation*, pp. 56–68.
[5] See F. W. Coker, *Organismic Theories of the State*, Chap. iv.

processes, which were based upon this earlier type of doctrine have accordingly been somewhat discredited. At the same time, it is more than ever agreed that the environment has a far-reaching effect upon every social group, in some cases overpowering social initiative and in others, the majority of instances, conditioning and limiting social activities which are directed toward the conquest of the environment and its adaptation for the use of the group. In this latter sense the question of environmental influences is still a pertinent and timely field for the student of society.[6]

As in biological, so also in psychological sociology, a radical change has come in the general view regarding the influence of the environment upon the life of man and society. The once popular notions of early theorists, which endured even in the writings of Buckle, that the physical environment exerts a direct influence upon the psychic characteristics of the group are now generally rejected.[7] It is no longer believed that there is, for example, any such direct correlation between the climate and mental traits as Montesquieu believed to exist. But this does not mean that there is no longer any belief in the significance of the environment in the study of group psychology. Individual psychology has come to view psychic activity as the result of a response of the individual organism to an external stimulus, and social psychology has accepted this mechanism to explain the chief phases of the mental life of groups. The environment furnishes the stimuli, and the social

[6] See Bristol, op. cit., pp. 68 ff., 111 ff; and L. J. Henderson, *The Fitness of the Environment*.

[7] See the opening section of F. H. Giddings' *Theory of Social Causation*.

groups react to this stimulation. It is obvious, then, that the environment will condition very materially the psychic life of social groups. In addition to the stimulation coming from the physical environment, there is the stimulus from the members of the group who react upon each other. In as much as the nature of the physical environment will greatly affect the composition, numbers, and activities of the group, it will operate indirectly to shape the social interstimulation. Further, while it is doubted whether the environment affects the human mind in such a permanent manner as to produce groups of distinct psychic types, it is held by many recent psychologists [8] that environmental conditions, such as weather phenomena, will effect temporary changes in the individual, and hence in the social psychic reactions. Then, as man's individual psychic reactions and those of the group are shaped by the activities of daily life, and, since the environment will to a large extent determine what these shall be, it must be evident that environmental influences have a considerable bearing upon group psychology. Finally, it is now generally admitted that the most important element in cultural progress is the contact of many cultures, while nothing breeds stagnation like isolation. Hence an environment which invites contact and provides easy access to and from other districts will promote psychic plasticity and cultural advancement, while one which produces isolation must of necessity lead to psychic stagnation and repetition.[9]

[8] See E. G. Dexter, *Weather Influences*, New York, 1904.

[9] This matter of isolation and stagnation is well treated by Reclus, Ratzel and Semple, while the whole subject of this section is best summarized by Giddings in his *Theory of Social Causation*.

The influence of physical factors upon political ideals and institutions has been generally acknowledged. No one now subscribes to the doctrines of writers like Montesquieu that liberty is directly correlated with high mountains and small political entities, and despotism with a warm climate, great plains, and large states, but the influence of the environment upon the forces creating and shaping the state and public policies is freely recognized. That the foreign policy of a state will be greatly affected by the character of its geographic boundaries and by its geographical location is obvious. An unprotected state must provide a much more effective military organization to compensate for this natural weakness or must form alliances with other states to achieve this end.[10] The influence of the environment is not less marked upon the domestic activities of a state. As has been made clear by such writers as Gumplowicz, Ratzenhofer, Small, and Bentley, the state is but an organization for adjusting and controlling the conflicting interests of the citizens and classes of citizens. What these interests will be, their relative strength, and the intensity of the struggle among them will depend in large measure upon the nature of the geographical habitat. The chapters which follow indicate the various ways in which the influence of the environment upon political life has been dealt with by anthropogeographers, but political scientists themselves have not been slow to recognize the significance of the physical environment for political processes. This has been brought into prominence in recent times by various analyses of the political history of the last century, which has been es-

[10] E. g. alliances of France—and England's navy.

sentially a struggle of the new commercial and industrial interests against the old landed aristocracy. Toynbee's account of the conflict between agrarian and industrial interests in England;[11] Beard's analysis of the interplay of economic interests in early United States national history;[12] Walter E. Weyl's discussion of the effect of economic pressure upon American political life at the present time;[13] Bentley's study of American political institutions;[14] and Solon J. Buck's treatment of the agrarian movement in recent American politics[15] are but a few familiar examples of this tendency to recognize the importance of the physical environment for political science.[16]

As economics is almost invariably considered by the economists to include a study of man's exploitation of his physical environment for his own needs, it is not necessary to dwell upon the fact that the study of the physical environment is of the utmost significance for that subject. Economic history is essentially an account of the progressive stages and methods in the conquest and utilization of the environment, while any sound and inductive science of political economy must be primarily an analysis of the methods by which the physical environment is utilized and the products distributed among those who participate in the economic struggle. Of course, a special significance is attached to the environment by such writers as Henry

[11] Arnold Toynbee, *The Industrial Revolution.*

[12] C. A. Beard, *An Economic Interpretation of the Constitution of the United States,* and *Economic Origins of Jeffersonian Democracy.*

[13] *The New Democracy.*

[14] *The Process of Government.*

[15] *The Granger Movement,* and *The Agrarian Crusade.*

[16] See Beard, "Political Science in the Crucible" in *New Republic,* November 17, 1917.

George, Francis Walker and Achille Loria who stress the importance of land, and by Le Play and his followers who have studied the problem of labor and income in its relation to the physical environment of the worker and his family. It is further evident that the economics of transportation is especially concerned with environmental factors, while geographic factors constitute almost the sole interest of the important field of commercial geography.[17]

In the field of anthropology the theory of environmental influences has played a great part. This was especially true in the days of the classical school of anthropology, as shown in the works of such writers as Lubbock, Tylor, Spencer and Frazer. This school assumed that the human mind was the same all over the world, and they held that cultural similarities resulted from the reaction of similar minds to the same type of environmental influences. As many of these writers also adhered to the theory of the inheritance of acquired characteristics, their type of doctrine assigned the utmost importance to the influence of the environment. As they are even now probably the most popular school of anthropologists in the esteem of the general public, their view of the effect of environmental influences upon cultural development is still widely accepted. While the more critical recent schools of anthropologists, including those who with Graebner defend the idea of diffusion, and the historical school of Boas, Wissler, Kroeber, Lowie, Goldenweiser and others, have rejected the theories of the classical school, they still agree in assigning great

[17] See H. J. Davenport, *Economics of Enterprise*, chap. i; Keller, Gregory and Bishop, *Commercial Geography;* and J. Russell Smith, *Industrial and Commercial Geography*, 1913, chap. i, p. 6.

importance to the influence of the environment upon cultural progress and social life. They have, however, modified the view of environmental influences and hold that instead of determining the course of human life they merely impose conditions which limit its development. The most important aspect of their criticism is this disposition to discredit the idea of a definite correlation between cultural similarities and environmental influences. By gathering numerous instances they have shown that peoples of identical racial stock living under the same general environmental conditions have developed radically different social and economic institutions—that is, they have reacted to the environment in widely different ways. In other words, this school demands that in the study of the influence of the environment the same critical inductive method be followed that is adhered to in other fields of investigation, with the purpose of discovering just what the environmental influences have been in each case and not with the hope of finding detached and isolated evidence to support a pre-assumed thesis. Whatever the progress in critical methods, it is obvious that, as anthropology concerns itself especially with primitive man and as environmental influences are greatest on primitive man, the study of the actual effect of the physical environment will long remain a prime field for the anthropologists. In addition to its interest in the influence of the environment upon cultural development, anthropology has been and will continue to be interested in the effect of geographical influences upon racial traits and the physical characteristics of mankind. In this field Ripley's study of the races of Europe in their relation to their environment, Boas' investigation of the

effect of the American environment upon immigrants from Europe and Huntington's elaborate study of the bearing of geographical conditions upon the production of racial types have been notable examples.[18]

In the old type of ethics, based on the theory of innate ideas or transcendental concepts, and wholly metaphysical in character, environmental doctrines could have no part. But a new type of ethical theory has since developed, which may be said to have taken its cue from Montesquieu's thesis that institutions are excellent in proportion as they are adapted to a particular environment. In its modern form this type of ethical theory has found its great exponent in Professor William Graham Sumner. His *Folkways* contains a vast amount of information proving that what constitutes morality depends wholly upon the customs and ideas of any people—i. e. what is moral is that which harmonizes with the current *mores*. Professor Sumner shows how the mores develop as a group becomes adapted to its environment. Therefore, as customs and institutions determine morality, and customs and institutions are in great part created by the reaction to a given environment, it is evident that morality and ethical systems and ideas bear a close relation to the environment. Thus, it may be seen that the present day scientific type of ethics must always bear a close relation to environmental theory.

Jurisprudence, like ethics, was once abstract and metaphysical. The "natural law" jurists, such as Grotius and Pufendorf, derived law from pure reason, holding that law bore no relation in its origin to either society or the

[18] Cf. R. H. Lowie, *Culture and Ethnology*. E. Huntington, *The Character of Races*, New York, 1924.

state—a purely metaphysical conception. The analytical jurists, such as Hobbes and Bentham, adopted a purely legalistic interpretation of jurisprudence. Law was assumed to be merely the command of the state and the origin or nature of the latter was not considered. Law, they held, had no genetic relation to geographical or social conditions. But in recent years both of these schools of jurisprudence have fallen into discredit as being unscientific. In their place have come the historical and comparative schools. The historical school, led by Savigny and Maine, believed law to be the product of the "genius of a nation" —hence that the geographical conditions which shape national civilization would affect the character and type of national law. A still more popular and scientific school of jurisprudence has recently developed—the *Comparative* —led by Brunner, Holmes, Maitland, Ames, Pollock, Letourneau, Coulanges, Jhering, Kohler, Post, Kovalevsky, and others. This school holds that law is the product of the experiences of all peoples and is evolutionary in its development. They hold that to discover the real source of law they must study not only the history of national law, but also legal development among all peoples in every stage of civilization, thereby arriving at a comprehensive and all-inclusive conception of the nature and history of law. It is really a scientific rebirth of the fundamental thesis of Montesquieu's *Spirit of Laws.* It is obvious that in these comparative surveys of legal development the influences of geographical conditions are always recognized as affecting the culture of the groups, while the culture determines the character of law which will be developed. There is here, then, an immediate relation between juris-

prudence and theories of the influence of the physical and social environment. In Koçourek and Wigmore's *Evolution of Law*—a great compilation of readings from leading authorities by two progressive modern jurists—two chapters of the third volume on "Formative Influences of Legal Development" are devoted to a discussion of geographical influences in the making and molding of legal systems. This is one of the best illustrations available of the present attitude and the tendency to link up legal development with environmental conditions. It is especially significant that the compilers deplore the fact that more material is not available on the influence of geographic factors upon legal development, and that they agree that the subject is of sufficient importance to warrant much further investigation.[19]

There has been no serious attempt by a sociologist to make a systematic and comprehensive investigation of the influence of the physical environment upon society. Rather they have depended for both data and systematic treatment upon anthropogeographers, psychologists and historians. The only systematic venture in this field has been made by Professor Giddings in his *Theory of Social Causation,* and that cannot be regarded as much more than a syllabus of the problems to be investigated. Spencer tabulated some of the more important geographical influences; DeGreef has indicated the geographic limitations imposed upon social structures; Thomas has gathered in

[19] On the above see Roscoe Pound, *Interpretations of Legal History;* the articles "Law" and "Jurisprudence" in the *New International Encyclopedia;* and Munroe Smith's lecture on "Jurisprudence" in the *Columbia University Lectures.*

his source-book a number of good selections; Blackmar and Gillin have presented a brief statement of the influence of geography on society; and most sociologists attach some importance to environmental factors, but they have made no comprehensive analysis of the field. The amount of enthusiasm which they manifest toward environmental doctrines varies with the different schools of sociologists. The psychological school is least enthusiastic and most sceptical, while the biological is most receptive. The historical sociologists are generally eclectic in the matter, accepting environmental theory for what they think it is worth, some putting it high and others low, but all attaching some importance to geographical factors.[20]

[20] See A. J. Todd, *Theories of Social Progress.*

CHAPTER II

THE HISTORICAL BACKGROUND OF ENVIRONMENTAL DOCTRINES

THEORIES of the influence of the physical environment upon human society, like other theories regarding mankind, have at all stages of history reflected the thought and culture of their day. It is evident, therefore, that without at least an elementary review of the intellectual setting of the theories to be discussed in the present work much of their significance would be lost. Such a review in brief outline is the purpose of this chapter.

The environmental theories of the Greeks were stimulated in part by a scientific curiosity to discover the reasons for differences in physical traits and social institutions among peoples with whom they came in contact, and in part by a patriotic desire to find some "natural" explanation for what they believed to be the inherent superiority of the Greek over the "barbarian." In the writings of Hippocrates there is little doubt that the element of scientific interest predominates, while it appears equally certain that Aristotle was chiefly concerned with establishing and explaining the preëminence of the Greek race and civilization. The philosophy upon which the Greeks based their environmental theories has long since passed, but the employment of environmental doctrines in the interest of chauvinism has endured much longer.

The Romans were even keener than the Greeks to dis-

cover the reasons for the superiority of their genius. They were confident that geographic reasons must exist to explain why Rome had been able to conquer the rest of the civilized world. Cicero attributed it to the strategic location of the city; Vitruvius to the all-round superiority of peoples located in the middle latitudes. Furthermore, the rather disastrous contacts of the Romans with the "barbarians" from the north, especially during the period of the Empire, led to a persistent belief in the fierceness of northern peoples and their inherent prowess in warfare. This latter belief very naturally lingered as an outstanding environmental doctrine of the "Dark Ages."

Environmental theories of the ancient and medieval periods were colored and quite largely shaped by two curious sets of doctrines (1) Astrology, and (2) the Greek physical philosophy. The astrologers believed that the sun, moon, and stars exert a direct influence on the affairs of men and of nations. They professed to foretell future events from a chart of the heavens showing the positions of the planets at a given instant—this chart, the aspect of the heavens which it represented, and its relation to the individual, being known as the horoscope. In order to construct the horoscope of an individual it was necessary to know (1) the date and hour of his birth, (2) the latitude and longitude of the place of birth, (3) the sex of the individual, (4) the position of the planets and stars at the time of birth, (5) the table of "houses" and planets. From these it was a simple matter to determine the destiny of the individual.[1] Thus astrology not only supplied the

[1] W. Gorn Old, *New Manual of Astrology* (London), 1898, pp. 1–2. Rosa Baughan, *The Influence of the Stars* (London), 1904, pp. 34–49.

basis of much ancient and medieval thought on our subject —it was in itself a comprehensive, if weird, body of environmental theory.

Natural astrology was the art of describing the movements of heavenly bodies; judicial astrology dealt with the influence of heavenly bodies on human destiny. Astronomy was a product of natural astrology, from which it only gradually became separated. The two developed side by side for a time until finally the very basis of astrology was destroyed.[2] It has lingered on, however, as a pseudo-science and even today vestiges of astrological belief exist and influence the lives of many ignorant and superstitious persons.[3]

The physical philosophy of the Greeks was based upon Empedocles' doctrine of the four elements combined with the Pythagorean theory of the mystic nature of numbers,

[2] "The power of astrology broke down when, with Copernicus, Kepler, and Galileo, the progress of astronomy overthrew the false hypothesis upon which its entire structure rested, namely, the geocentric system of the universe. The fact that the earth revolves in space intervened to upset the complicated play of planetary influences, and the silent stars, relegated to the unfathomable depths of the sky, no longer made their prophetic voices audible to mankind. Celestial mechanics and spectrum analysis finally robbed them of their mysterious prestige. Thenceforth in that learned system of divination, which professed to discover from the stars the secret of our destiny, men saw nothing but the most monstrous of all the chimeras begotten of superstition." F. Cumont, *Astrology and Religion among the Greeks and Romans*, Introduction, p. xvi.

[3] An article appeared in the *World Magazine* of July 22nd, 1917, under the title "When Will the War End?—Ask the Astrologers." Forecasts were received from ten leading American astrologers. There was no substantial agreement among them, but the majority of the forecasts fell somewhere within the year 1917. One thought Germany would lose because the "aims, acts, methods and deeds of the German Kaiser and his supporters are so diametrically opposed to the higher vibrations of Neptune." Another said England could not win because of King George's weak horoscope and the fact that "England declared war when the Moon in her detriment was leaving the opposition to Neptune." Eight of the astrologers predicted victory for the Allies; one thought the war would end without victory; and one, a gentleman named Gustave Meyer, prophesied a German victory.

and, along with astrology, it underlies practically all of the climatic theories held by ancient and medieval writers. The four primordial elements of Empedocles were earth, air, fire and water, which made up all bodies including man. Genesis consisted in the union of these elements, health in their proper proportion, and death and disintegration in their separation and repulsion.[4]

The Pythagorean doctrine of the mystic virtue of numbers was combined with the four elements in such a way as to result in all sorts of fanciful notions. For example: hot + dry = fire; cold + dry = earth; hot + moist = air; cold + moist = water. Again, the four humors of the body, blood, phlegm, black bile, and yellow bile, supposed by the ancients to be the seats of disease, were produced in like manner, i. e., hot + moist = blood; cold + moist = phlegm; hot + dry = yellow bile; cold + dry = black bile. There were four corresponding ages of man—adolescence = hot + moist; manhood = hot + dry; advanced age = cold + dry; old age = cold + moist.[5]

It seemed natural that the character of the climate or weather would tend to increase hot, cold, dry and moist conditions in one case or another, and would thus have a direct influence upon the health of the individual. Hot and dry climates would dry up too much of the bodily moisture and reduce vitality; changes in seasons would have an influence upon the four elements and affect the health, disposition, and temperament of peoples, all of which were determined by the mixture of the elements. Atmospheric

[4] F. H. Garrison, *An Introduction to the History of Medicine*, Philadelphia, 1917, pp. 75 ff.

[5] Ibid.

conditions would thus operate directly and in a definite way to modify the physical and mental characteristics of human groups. Astral influences were also of great importance in determining the amount and mixture of these constituent humors in the body. One finds it difficult to believe that a doctrine so hopelessly absurd was not overthrown as the basis of popular chemistry, physiology and medicine down to the time of Boyle and Lavoisier, though of course the more critical thinkers had come to doubt it before that period.[6]

It seems hardly an exaggeration to say that whatever may have been the influence of real geographic factors on western civilization from 500 B. C. to 1600 A. D., it did not surpass in importance the influence upon the human mind of these imaginary factors of the heavens set forth in that remarkable body of pseudo-scientific and ingenious superstition—astrology, and that curious collection of *a priori* generalizations—the Greek physical philosophy. Certain it is that without a knowledge of the essential facts of astrology and Greek physical philosophy a true understanding of ancient and medieval theories of the influence of physical environment is quite impossible.

Indeed, when one reads in the works of Hippocrates, Vitruvius, and Bodin that the peoples of warm climates are conspicuous for their passionate natures; that those of cold climates are noted for their bodily strength and endurance; and that those of the temperate zone are known for an intellectual superiority which has enabled them to make important contributions to civilization, one might

[6] Ibid.

think he was getting close to the doctrines of Ward or Huntington. But as soon as one examines the underlying causes assigned for these observed facts, he sees that there is no very marked foreshadowing of recent writers when the passionate tendencies found in warm climates are attributed to the planetary influence of Venus; when the cultural superiority of those in the middle latitudes is attributed to the domination of that region by Jupiter; or when the physical differences produced by climatic conditions are represented as resulting from a recombination of the four elements, or a different mixture of the four humors of the body.

The philosophy of Scholasticism was quite slavishly dependent upon the ideas of Aristotle; and the Scholastic philosophers, such as Thomas Aquinas, did little more than repeat Aristotle's views on the superiority of peoples in middle latitudes and on the proper environmental background of a prosperous city-state. A few original observations were stimulated here and there by differences in local environment and historical conditions, but the general ideas remained unchanged. In addition to this classical element in Scholasticism, the theological notion of man's origin and destiny, which prevailed from the origin of Christianity to the rise of Deism and rationalism in the seventeenth and eighteenth centuries tended to discourage the development of theories implying anything so materialistic as a causal relationship between the physical environment and man's thoughts and actions.[7]

[7] M. DeWulf, *History of Medieval Philosophy.* W. A. Dunning, *Political Theories, Ancient and Medieval,* chap. viii.

Although the period of the "Renaissance" was not especially productive of environmental theories, a few developments are worthy of mention. The humanism of the Renaissance meant an interest in classical culture rather than in problems of social causation, but the recovery and editing of lost or imperfect classical texts led of course to an increased knowledge of the theories of earlier writers on the subject of geographic influences. Machiavelli's attempt to substitute a material view of causation for the theological notions that had prevailed for a thousand years helped pave the way for a greater popularity of environmental doctrines. Finally, a few writers of this period, notably the Italian historian, Æneas Sylvius, and his German follower, Albert Krantz, investigated the relation of environment to the historical development of peoples. The religious reaction in the Protestant Reformation and the Catholic Counter-Reformation produced a revival of the ultra-theological views of the early Middle Ages which discredited naturalistic explanations of social phenomena and therefore did not foster the development of environmental theory.[8]

Naturally enough the first great impulse to a thoroughgoing development of environmental theories came as a result of the discoveries and colonizing enterprises of the sixteenth and seventeenth centuries known as the Commercial Revolution. Many new types of men and a variety of strange social institutions and customs were revealed.

[8] E. Fueter, *L'Histoire de L'Historiographie moderne*, pp. 1-304. Dunning, op. cit. chap. xi. Dunning, *Political Theories from Luther to Montesquieu*, chaps. i-ii.

The writers of the period described not only these peoples and their customs, but also their habitats, and this gave rise to a new interest in the geographic foundations of history and ethnography. Some explanation had to be found for the newly discovered diversities, and the prevailing theological doctrine of a single creation of mankind made the geographic explanation both acceptable and orthodox. Finally, and perhaps most important of all, this period brought into popularity once more the concrete and comparative method of studying the problems of race and culture which had been employed in classical times by such writers as Herodotus, Strabo, Cæsar and Tacitus. Moreover, the modern national state was quite definitely a product of the political and economic factors in the Commercial Revolution and this gave a new impetus to the discussion of the part played by geographic factors in the shaping of political institutions. Utilizing the data made available by the discoveries as well as that provided by classical lore, Jean Bodin became the first great outstanding figure in the history of environmental doctrines in the early modern period. While not entirely free from the traditions of Humanism, Bodin illustrates in a striking manner the beginnings of the comparative method of study in modern times.[9]

Another thing which furthered the popularity of materialistic explanations of social processes was the development of natural science and the subsequent growth of

[9] Dunning, op. cit. chap. iii. W. R. Shepherd, "Expansion of Europe" in *Political Science Quarterly*, 1919. J. E. Gillespie, *Influence of Oversea Expansion of England*, chaps. viii–x.

rationalism in the seventeenth and eighteenth centuries. To a very large degree this was also a product of the intellectual stimulus which came from the Commercial Revolution in its broadest aspects. The discoveries in the fields of mechanics and chemistry, associated with the names of Galileo, Kepler, Newton, Boyle and Lavoisier which had destroyed the older astrological doctrines and the physiological notions associated with the theory of the four elements, also struck a vigorous blow at the old theological traditions by making "natural causes" popular. This phase of the movement was powerfully forwarded by the *Deists* and the French *Philosophes,* who not only favored the idea of natural causation, but also the notion of a natural order in the universe. Mead and Arbuthnot made contributions to environmental theory which illustrated the influence of the new physics and chemistry. Montesquieu combined this view with the comparative method which had been brought into existence by the Commercial Revolution. The French *Physiocrats* utilized the Deists' notion of a natural order pervading the universe and developed an agrarian philosophy of history. The progress in biology in the eighteenth century was also of significance. The growth of natural history and biological classification, as a result of the work of Linnæus, Cuvier and Buffon, brought to the attention of scholars not only the resemblances in the animal and vegetable kingdoms, but also the differences, and here again the notion of a special creation tended to give a sanction to the view that existing differences were due to differing habitats. To be sure, not all of the rationalist school were advocates of

the environmental explanation. Voltaire spoke lightly of Montesquieu's views on the subject, and Hume favored a psychological explanation of cultural differences and resemblances, but even these writers indirectly aided the progress of environmental doctrine by discrediting the notion of the supernatural and the miraculous.[10]

The most powerful attack made upon the anthropogeographical point of view came in the movement known as "Romanticism" and associated chiefly with the doctrines of such writers as Fichte, Schlegel, Schelling and Hegel. This group assigned supreme importance to psychic or spiritual factors—"idea-forces"—and generally rejected the geographic explanation. They also discouraged concreteness and detailed investigation of the process of social causation, maintaining that the all-important spiritual forces moved and operated in a mysterious manner which defied complete discovery and detailed analysis. It is true that Hegel, the greatest of them all, devoted considerable space in his *Philosophy of History* to a discussion of the "geographical basis"—yet he assigned it no outstanding importance, regarding it as merely one element in the historical process.[11] Romanticism and environmental doctrine had little in common.

The gradual shaping of scientific and systematic anthropogeography during the nineteenth century was closely re-

[10] Dunning, op. cit. chap. xii. Dunning, *Political Theories from Rousseau to Spencer*, chap. ii. Sedgwick and Tyler, *Short History of Science*, chaps. x–xiii. A. C. McGiffert, *Protestant Thought Before Kant*, chap. x. H. Higgs, *The Physiocrats*.

[11] Fueter, op. cit. pp. 517–73. W. T. Marvin, *History of European Philosophy*, pp. 369–83. A. Rogers, *Students' History of Philosophy*, pp. 424 ff. R. Flint, *History of the Philosophy of History*, (1874), pp. 366 ff.

lated to the developments in science and thought during that period. The notion that geographical factors were involved in both race differentiation and social processes had come down from an earlier period, but a comprehensive understanding of this relationship was not possible without an adequate knowledge of the essential facts of biology and an equal familiarity with the topographical and climatic features of the earth. These facts were made available by science and discovery. The biological knowledge was furnished by Buffon, Cuvier, Lamarck and others, while the scientific explorations carried on by men like Alexander von Humboldt supplied the necessary information about geographic conditions outside of the general range of European experience. The first man to recognize this newly acquired fund of scientific and geographical data and to utilize it in the service of anthropogeography was Karl Ritter. This great German historian and teacher is usually regarded as the first comprehensive student of the science of geography in its relation to mankind, and his discussions of the geographical foundations of social processes entitle him to a permanent place among the builders of that science. He is important also as the inspirer of a number of enthusiastic followers including Guyot, Cotta, Kohl, Peschel and Reclus, who have themselves made valuable contributions. But in spite of all his erudition and insight Ritter scarcely belonged to the present era in anthropogeography. He was never quite able to free himself from the mystical element which he had inherited from Romanticism, especially in his treatment of the relation between geography and history, and he lived too early to

bring the evolutionary doctrine of Darwin into the service of anthropogeography.[12]

It would be difficult to exaggerate the effect of Charles Darwin's doctrine of evolution upon the geographic explanation of social development. Of all the innovations in thought during the nineteenth century his notion of the gradual evolution of the organic world as a result of adaptation and readaptation to surrounding conditions was second to none in its significance for environmental theory. It is true that his thesis wholly destroyed the idea of both the fixity of the species and of a special creation and thus broke down the theory that environment was the only possible cause of variation, but the net effect of the evolutionary doctrine upon the geographic explanation was to give it greater strength. It came to be regarded as one of the two great factors whose combined operation resulted in organic evolution and it was thereby placed on a scientific basis and clothed with a dignity greater than it had previously enjoyed.

At this time, also, the Industrial Revolution, which was effecting the most radical changes in the social, industrial and economic life of man and transforming the whole basis of civilization, demonstrated with remarkable clearness the prominent part played by economic factors in the general scheme of social causation. Mankind, formerly living in scattered rural communities, now assembled in congested urban groups around factory centers with a distinct lowering of living conditions and general social standards.

[12] See Alvin Wünsche, *Die geschichtliche Bewegung und ihre geographische Bedingtheit bei Carl Ritter und bei seinen hervorragendsten Vorgängern in der Anthropogeographie.*

Following these prodigious changes in the social order, it was natural and logical for Karl Marx and others to formulate their materialistic interpretation of history which assigned a considerable degree of importance to the influence of the physical environment.[13]

It was upon these foundations—the achievements of Ritter; the progress in science and thought, and the greater volume of the data of anthropogeography, that Friedrich Ratzel developed the first great scientific and systematic analysis of the various geographic factors which affect the evolution of man and the nature of society. Not only did Ratzel make use of scientific knowledge, particularly the doctrine of evolution, which had not been available for his predecessors, but he made a thorough and scientific classification of the chief elements in the physical environment —in other words, he created the categories of anthropogeography. Since the day of Ratzel the chief lines of progress in that science have been either in the way of a systematic survey of the whole field, as in the works of Reclus, Semple or Brunhes, or the more detailed investigation of the distinct divisions of the subject marked off by Ratzel, as in Metchnikoff's study of river basins, Demolins' investigation of routes of migration, Huntington's survey of climatic factors, and Dexter's study of weather influences.[14]

In conclusion, there should be noted a recent development which, while not directly associated with the growth of anthropogeography, offers a valuable instrument for its

[13] H. F. Osborn, *From the Greeks to Darwin.* J. W. Judd, *The Coming of Evolution.* E. R. A. Seligman, *The Economic Interpretation of History.*

[14] J. Brunhes, *Human Geography,* chap. ii. L. M. Bristol, *Social Adaptation,* chap. vi. F. S. Chapin, *Social Evolution,* chap. v.

scientific improvement and a means of checking up its generalizations. This is the science of statistics, originated by Quetelet, and expanded by men like Galton and Pearson. It is the one completely reliable method of establishing definite correlation between environmental factors and social processes, and it furnishes critical students with a means of checking up the claims of proponents of the geographical explanation of society.[15]

[15] F. H. Hankins, *Adolphe Quetelet as Statistician.* J. Koren (ed.), *History of Statistics.*

CHAPTER III

CLIMATIC INFLUENCES: ANCIENT AND MEDIEVAL THEORIES

THE meaning we shall give the term *climate* in the chapters dealing with *climatic influences* is broad and inclusive. Strictly speaking, *climate* denotes a general average of atmospheric conditions, such as the temperature, humidity, and rainfall of a given area over a long period of time, while *season* and *weather* have reference to periods of much shorter duration. Moreover *climatology,* which investigates the phenomena of these average atmospheric conditions, and *meteorology,* sometimes called the physics of the atmosphere, which deals with conditions associated with the weather, are often treated as separate sciences, although it would obviously be impossible to divorce the two entirely. In this work, however, we shall treat them together and discuss under a single heading the influence of climate, seasonal changes, and the various conditions of the weather.

In his treatise, *On Airs, Waters, and Places,* Hippocrates, the great physician of antiquity, presents the first serious attempt to correlate racial and social types with differences in the physical environment. In comparing the inhabitants of Europe with those of Asia he holds that the qualities of a people are determined in large measure by corresponding qualities in their environment.[1]

[1] Hippocrates allows also for other factors such as topography, food and social organization. See below pp. 120-121, 226-227.

The Europeans, he says, are of great variety, vigor and fierceness, and those of Asia are noted for their equable and gentle dispositions. These qualities are in accord, respectively, with the rapidly changing seasons of Europe and the mildness and uniformity of the Asiatic climate. To develop vigor and bravery a climate is needed which will excite the mind, ruffle the temper, and demand fortitude and exertion.[2]

When he attempts to go deeper into the question of racial uniformity, Hippocrates offers an explanation which has little validity today. He believed, in common with other ancient writers, that the fœtus was formed from the male seminal fluid. Changes in the seasons would affect the nature of the fluid and hence the characteristics of the child. Thus in an equable and unvaried climate the fluid would be uniform and the children would resemble each other; in a variable climate diversity of population would be the rule. Thus Europe with its variable climate contains a variety of people, and for exactly the opposite reason uniformity prevails in Asia.[3] Fantastic as this explanation seems, it is about as acceptable as any offered down to the nineteenth century, when the uniformities were ascribed to the struggle for existence and natural selection, the pressure which gives rise to the struggle being the growth of population, with the environment playing an important part in limiting and directing the selective process.

Hippocrates also discusses differences among popula-

[2] Hippocrates "On Airs, Waters, and Places," trans. by Francis Adams in *The Genuine Works of Hippocrates*, Vol. I. pp. 158 ff., 169 ff., 181 ff. Recent republication by Wm. Wood and Company, New York, used here.

[3] Hippocrates, op. cit. pp. 169–171, 180, 182.

tions of the same continent. He shows that, while in general climatic and other environmental conditions in Asia are uniform, there are exceptions to this rule and wherever one finds rapid changes of season there also is found a variegated population, as in Europe.[4] The people, for example, who occupy the territory around the sea of Azov, a region of rapid seasonal changes, are highly variegated.[5] In Europe, the Scythians, occupying the region north of the Black Sea, have a climate that is cold and humid with moderate changes of season and little or no summer. They are neither alert, vigorous, nor variegated, but are uniform in character and incapable of great mental or physical exertion. The humidity is so great that the people resort to burning their bodies in order to dry up the excess of the watery element and thereby gain strength.[6] He reiterates, however, that varied environments are the rule in Europe and those of a uniform type in Asia, and that therefore the outstanding qualities among Europeans are vigor, enterprise, and heterogeneity, while uniformity, languor, and indolence prevail in Asia.[7]

It is not easy to evaluate the environmental doctrines of Hippocrates. He was a most acute observer of natural phenomena, his inductive method is worthy of notice, and he takes high rank as an innovator of a method of social investigation. His errors in the assignment of causes are attributable mainly to the physical philosophy of his day and to his curious notion of generation. As to his influence

[4] Hippocrates, loc. cit. pp. 169–171, 180.
[5] Op. cit. p. 170.
[6] Op. cit. pp. 174–180.
[7] Op. cit. pp. 169–170, 180–183.

on later writers there can be little danger of exaggeration. Aristotle made large use of his generalizations, and Aristotle's conclusions were in turn revived by the Scholastic commentators, of whom Aquinas was the most noted. His works, of which *On Airs, Waters, and Places* was among the most celebrated, formed the basis of the greater part of medical science down to the seventeenth century. In fact, at the beginning of the eighteenth century, Richard Mead, probably the first great medical writer since Hippocrates to make an original study of the influence of the physical environment, quoted with approval from the work *On Airs, Waters, and Places.*[8]

People who live in the cold climate of northern Europe, said Aristotle, are conspicuous for their spirit, but their lack of intelligence unfits them for political organization and dominion. Asiatic peoples, on the other hand, are preeminent for intelligence and inventiveness, but are lacking in spirit and are consequently content to remain in subjection and slavery. The Greeks, being intermediate in position, were held to combine the advantages of both extremes without their shortcomings, and were therefore the best governed people in the world and by nature fitted to rule the earth.[9]

Subsequent developments have not materially affected the seeming validity of Aristotle's theory concerning the Asiatic peoples, unless it be the recent awakening of Japan. On the other hand, the development of northern European

[8] Richard Mead, *A Treatise on the Influence of the Sun and Moon upon Human Bodies.*

[9] *Politics*, trans. by Jowett. VII, 7. Cf. E. Barker, *The Political Thought of Plato and Aristotle*, New York, 1916, pp. 409–10.

nations has overthrown any doctrine which held them to be incapable of evolving a political organization. It is true that their independent spirit might have prevented the lasting success of an aristocratic political organization such as Aristotle considered ideal, but north European peoples have worked out forms of government more equitable and, it seems reasonable to believe, more successful and more enduring than any other type which has yet appeared.[10]

The Greek historian, Polybius, asserts in his *History of Rome* that a knowledge of the geography of a country is essential to a proper understanding of its history.[11] Most important of his contributions to the subject at hand is a short reference to the influence of climate upon national character and the possibility of remedying a detrimental influence by a wise system of education and discipline.[12] Discussing the reasons for the introduction of music into Arcadia he says, "They saw that Arcadia was a nation of workers; that the life of the people was laborious and hard; that as a natural consequence of the coldness and gloom which were the prevailing features of a great part of the country, the general character of the people was austere. For we mortals have an irresistible tendency to yield to climatic influences; and to this cause, and no other, may be traced the great distinctions which prevail among us in character, physical formation and complexion, as well as in most of our habits, varying with nationality or wide local separation. And it was with a view of softening

[10] Cf. Barker, Ibid.
[11] Polybius, *History of Rome*, BK. III, Sec. 36.
[12] Op. cit. Bk. IV, Sec. 21.

and tempering this natural ruggedness and rusticity, that they introduced the things which I have mentioned." [13]

It seems rather strange that the most extensive Roman discussion of the influence of climate upon the mental and physical traits of a people should be found in the work of the famous writer on architecture, Vitruvius. He bases his climatic theory upon the curious doctrine of the four elements of Empedocles. Speaking of northern peoples he says that the extreme cold fails to draw out enough of the moisture from the body, and that, as the atmosphere is also moist, the people of the north "are of vast height, and have fair complexions, straight red hair, grey eyes, and a great deal of blood, owing to the abundance of moisture and the coolness of the atmosphere." [14] The men of the north are thus helpless in the face of fevers or great heat, but are rendered brave in war by their large supply of blood.[15] Describing southern peoples he says that men of the extreme south, living under the direct rays of the sun, have too much moisture drawn out of their systems and hence have little blood. Therefore, while able to endure fever and heat with ease, they are timid in battle. As compared with northern peoples, they are "of lower stature, with a swarthy complexion, hair curling, black eyes, strong legs, and but little blood." [16]

[13] References to Polybius are from the translation of Shuckburgh, London, 1889. For a treatment of Polybius see J. B. Bury, *The Ancient Greek Historians*, New York, 1909, pp. 191–221; and J. T. Shotwell, *An Introduction to the History of History*, New York, 1922, pp. 191–201.

[14] Vitruvius, *The Ten Books on Architecture*, trans. by Morgan, Cambridge (Mass), 1904, Bk. VI, chap. i, sec. 3.

[15] Ibid. sec. 4.

[16] Ibid. sec. 4.

When he discusses the difference in the pitch of the voice between northern and southern peoples, Vitruvius offers an explanation of quaint and curious interest. He says the voices of the men of the north are heavy as a result of the cold and damp air, and that the voices of the southern people are shrill as a result of the warm dry air. He shows how the truth of this assumption may be tested by heating cups and then cooling one in water and striking them. The hot one, he says, will respond at a higher pitch, and moreover, this variation of the pitch of the voices with the climate is interesting as illustrating the essential harmony of the universe. The heavens touch the earth at the extreme south, while they are the highest at the north pole. As a result the pitch of the voice, as it varies with the height of the heavens, is like a musical instrument, since the shorter strings give higher pitch.[17]

Southern peoples have a keen intelligence, owing to the rarity of the atmosphere and the heat, while "northern nations, being enveloped in a dense atmosphere, and chilled by moisture from the obstructing air, have but a sluggish intelligence." This is illustrated, he says, by the activity of snakes in warm weather as contrasted with their torpor and stupidity in cold weather.[18] He goes on to say, however, that although southern peoples excel in intelligence, they cannot meet situations which call for bravery because their courage "is sucked out of them by the sun." He considers those living in cold regions far better equipped physically to engage in actual combat, but their courage not

[17] Vitruvius, op. cit. secs. 5–8.
[18] Ibid. sec. 9.

being accompanied by intelligence, they are likely to lose this advantage through a lack of judgment.[19]

After thus explaining the alleged inferiority of peoples living in both the extreme south and in the extreme north, Vitruvius says that the situation which will produce the best race is that midway between these two extremes, pointing by way of illustration to the region occupied by the Roman people.[20] Aristotle, as has been shown, held the same theory about the superiority of peoples in middle latitudes, but his observations led him to draw the line a little farther to the south—through Greece. It will be seen as we proceed that this line of racial superiority is of a migratory nature following the dictates of patriotic pride.

Like Vitruvius, Pliny is of interest chiefly because of the liberal use he makes of the curious Greek physical philosophy to support his theory of climatic influences. In the passage which follows, he does not specifically state that Rome is the "middle of the earth" referred to, but the implication seems reasonably clear:

> There can be no doubt that the Æthiopians are scorched by their vicinity to the sun's heat, and they are born, like persons who have been burned, with the beard and hair frizzled; while, in the opposite and frozen parts of the earth, there are nations with white skins and long light hair. The latter are savage from the inclemency of the climate, while the former are dull from its variableness. We learn, from the form of the legs, that in the one, the fluids, like vapour, are forced into the upper parts of the body, while in the other, being a gross humour, it is drawn downwards into the lower parts. In the cold regions savage beasts are pro-

[19] Ibid. sec. 10.
[20] Ibid. sec. 11.

duced, and in the others, various forms of animals, and many kinds of birds. In both situations the body grows tall, in the one case by the force of fire, and in the other by the nutritive moisture.

In the middle of the earth there is a salutary mixture of the two, a tract fruitful in all things, the habits of the body holding a mean between the two, with a proper tempering of colours; the manners of the people are gentle, the intellect clear, the genius fertile and capable of comprehending every part of nature. They have formed empires, which has never been done by the remote nations, yet these latter have never been subjected by the former, being severed from them and remaining solitary, from the effect produced on them by their savage nature.[21]

In the theories of Claudius Galen, the greatest medical writer of Roman times, are combined the ancient notion of the humors, blood, phlegm, black bile, and yellow bile with the four elements of Empedocles, earth, air, fire, and water, which entered into the composition of man, and to this he added his own conception of a "vitalizing spirit" pervading the organism.[22] As the four elements had the qualities, hot, cold, dry, and wet, climatic influences would naturally intensify any predisposition toward disease, i. e., any disturbance of the proper proportion in the mixture of the elements. Thus a cold climate would aid the progress of a disease caused by a cooling of the elements, and prevent one caused by a heating of the elements. The same line of reasoning was held to apply to hot, dry, and wet climatic conditions. Galen added little, if anything, to the theories of Hippocrates, but his preëminence in the medical lore

[21] *The Natural History of Pliny*, Bk. II, chap. lxxx, pp. 110–111, trans. by John Bostock and H. T. Riley, London, 1857.

[22] F. H. Garrison, op. cit. p. 77.

of the middle ages lends historical interest to his doctrines.[23]

Vegetius, whose life is shrouded in great obscurity, was probably the leading authority of later classical times on contemporary military methods. In his work *De Re Militari* he discusses the effect of climate upon military prowess. He held that people living in hot southern climates are weakened by the effect of the heat, and he shared with other classical writers the notion that people in warm climates excel in wisdom, while those in cold climates have greater courage. Though they have more wisdom than those living in cold climates, southern peoples have little vitality, persistence, or courage in war. Northern people, on the other hand, are eager for war on account of their greater vigor resulting from the colder climate, but they are inferior in intelligence to those in the south. He agrees with other classical writers also in holding that those who inhabit the intermediate regions are on the whole superior, since they lack neither courage nor intelligence.[24]

So far as any original contribution to our subject is concerned, the medieval period is almost a barren waste. And this is not strange. For an age whose thinking is hedged in on one side by antique philosophy, and on the other by dogmatic faith, and whose chief interest lies in "the conception of man's divinely mediated salvation" could hardly

[23] Cf. Galen "On the Natural Faculties," trans. by A. J. Brock, Bk. II, chaps. viii–ix; and Anton Meuten, *Bodins Theorie von der beeinflussung des politischen Lebens der Staaten durch ihre geographische Lage*, Bonn, 1904, p. 22.

[24] Flavius Vegetius, *De Re Militari, Libri Quinque* (ed. by Schwebelli) Bk. I, chap. ii, pp. 5–6, cf. Meuten, op. cit. pp. 22–23.

be expected to concern itself with so mundane a thing as the physical environment.[25]

Paul the Deacon, the historian of the Lombards, writing after the period of the barbarian invasions, attempted to show a relationship between climate and growth of population. He thought northern regions more healthful than hot southern regions, and held therefore, that populations would increase much more rapidly in the north than in the south. Paul goes so far as to say that the colder the climate the more healthful the region and the greater the tendency toward increase of population. A corollary of this increase of population would be vast migrations resulting from overcrowding in the north, and he speaks of these migrations as the "scourge of portions of Asia, but especially of the parts of Europe which lie next to it."[26]

The scholastic philosophy, which flourished in western Europe from the twelfth to the sixteenth century, was primarily a harmonizing of Aristotelian philosophy with Christian dogma.[27] It is not surprising therefore that the theories of Aquinas on the influence of geographic environment should be in the main a running commentary upon Aristotle's opinions, combined with a few variations of his own.[28]

[25] "Generally speaking, the conception of man's divinely mediated salvation, and of the elements of human being which might be carried on, and realized in a state of everlasting beatitude, prescribed the range of ultimate intellectual interests for the Middle Ages." H. O. Taylor, *The Medieval Mind*, London, 1911, Vol. II, Bk. VII, chap. xxxv.

[26] Paul the Deacon, *History of the Langobards*, trans. by W. D. Foulke, Philadelphia, 1907, Bk. I, chap. i, pp. 1–2; cf. C. J. H. Hayes, *An Introduction to the Sources Relating to the Germanic Invasions*, New York, 1909, p. 196.

[27] Cf. H. O. Taylor, op. cit. Vol. II, Bk. VII, chap. xxxv.

[28] *De Regimine Principum* contained in *Opuscula Selecta S. Thomæ Aquinatis*, Paris, Lethielleux, 1881, Vol. III, Bk. II, chap. i, pp. 254–454.

Aquinas centers his discussion about the advice he gives a ruler on the procedure to be followed in founding a city, and it bears a close resemblance to Aristotle's discourse on the location of his ideal commonwealth.[29] A temperate and comfortable climate gives the best assurance of healthy and contented people, and he therefore advises that extremes of heat and cold be avoided.[30] He quotes in full a passage from Vegetius regarding the superiority of northern nations in war, of southern nations in intelligence, and of the all-round superiority of nations in the middle latitudes, reproducing faithfully the reasons assigned by Vegetius for such superiority.[31] He next quotes in full also a selection from Aristotle regarding the general superiority of nations inhabiting temperate regions.[32]

Aquinas holds, however, that more than a temperate climate is needed to assure good health. The site should be on high ground to secure good air, and above all marshes should be avoided as a source of contamination, for the plague has its origin in the gases which arise from them. Moreover, a location should be sought which will insure warmth and protection in winter and cool breezes in summer.[33] It is an attractive picture—a temperate and salubrious climate, southern exposure, good sanitary conditions, pure water, and a beautiful view—a real city beautiful.[34]

[29] *Politics*, VII, 4–8, trans. by Jowett, Oxford, 1885.
[30] Aquinas, loc. cit.
[31] Vegetius, op. cit.
[32] *Politics*, VII, 7.
[33] Aquinas, loc. cit.
[34] Cf. J. M. Littlejohn, *The Political Theory of the Schoolmen and Grotius*, New York, 1896, pp. 92–96.

A comparison of the contributions of the Greeks to the subject of environmental influences with the contributions of the medieval period brings out in a striking manner the difference between the product of independent thinking and that of thinking based on authority. Taylor says that this "deference to authority" characterizes all medieval thinking, and he draws a sharp contrast between the barrenness of the medieval writers "who drew their knowledge from an existing source" and the fertility of the Greeks, "who had created so much of that source.[35]

The great Arab historian and geographer, Ibn Khaldun, made several important contributions. He divided the earth and its people into seven climatic zones, and discussed the social and cultural effects of this climatic distribution as well as its effects on race and pigmentation.[36] His climatic divisions were based upon the work of an earlier Arab geographer, Ibn Idrisi, whose work *The Going Out of a Curious Man to Explore the Regions of the Globe, Its Provinces, Islands, Cities and their Dimensions and Situations,* appeared about 1154.[37] Idrisi's work probably represents the best in Arabic cartography of the middle ages, and as such it is an amazing combination of astronomical knowledge, more accurate than the Christian scholars reached for centuries, with some very crude medieval notions of geography.[38]

Like most of the Arab astronomers and geographers

[35] H. O. Taylor, op. cit.

[36] R: Flint, *History of the Philosophy of History in France, Belgium and Switzerland,* pp. 156–170.

[37] *Geographie d'Idrisi,* trans. into French by P. A. Jaubert, Paris, 1840.

[38] Lynn Thorndike, *History of Medieval Europe,* New York, 1917, pp. 383–4.

Khaldun believed that the earth is round like a sphere, and submerged in water from the south pole to about latitude 15 or 20 degrees south.[39] It was only that part of the earth north of the equator which he divided into zones, because he did not consider the southern hemisphere habitable to any extent and also because the greater part of it was under water.[40] He takes up much more fully than Idrisi the matter of the climatic divisions and he discusses at considerable length the various degrees of latitude by which earlier geographers have marked off the seven climatic zones. He discusses also the four different schemes proposed by Ptolemy, Ishac Khazeni, "Un Autre Maitre" and Abou Khazeni, but apparently did not favor any one of them in particular; at least he does not commit himself to any one of them. For theoretical purposes there were few vital differences among them. Each divided the earth into seven climatic zones and each by means of perpendicular lines divided each zone into seven compartments. As to the climatic differences found in the seven zones, Khaldun asserts that the zone farthest north suffers from an excess of cold and that the one next to the equator suffers from an excess of heat. He finds that the fourth or middle climatic zone enjoys a happy medium between the two extremes, while the third and fifth zones differ only slightly from the fourth and may for all practical purposes be regarded with the fourth as predominantly temperate. The second and sixth zones approach the hot and cold ex-

[39] *Prolégomènes historique*, d'Ibn Khaldoun, trans. into French by M. de Slane, Part I, Vol. XIX in *Notices et extraits des manuscrits de la Bibliothèque Impériale*, Paris, 1862, pp. 106–8.

[40] Ibid. p. 108.

tremes, while the first and seventh represent the extreme limits of habitability.[41]

Discussing the mental characteristics of the inhabitants of the different zones, Khaldun holds that the inhabitants of the warm climates are noted for their passionate natures and their ready abandonment to intense physical pleasures. Those of the cold climates, on the other hand, incline to stolidity and to an almost total lack of vivacity. Between these two extremes, the peoples of the middle climates strike a happy medium. They are neither excessively passionate nor markedly stolid and they excel in wisdom. The vivacity and passion of the warm climates he attributes to "the dilation and expansion of the animal spirits," while the stolidity of the north is due to exactly the opposite condition. This dilation or expansion of the spirits is attributable to the effect of heat produced externally or internally. Wine will produce the same tendency to excitement and passion in the inhabitants of the middle or northern climates, but the inhabitants of the southern or warmer climates do not need wine to cause the heating and dilation of the animal spirits. There is such an excess of heat from without that an inhabitant of a warm climate is like a dweller in a cold climate who is continually under the influence of wine. On the other hand, the air of the cold climate astringes or condenses the animal spirits which gives rise to a tendency toward solemnity and stolidity. In the temperate region there is once more the desirable average between the two extremes.[42]

Like Aristotle, Khaldun was interested in his own coun-

[41] Khaldun, op. cit. pp. 108–11.
[42] Ibid. pp. 174–5.

try and it was doubtless disappointing to him that Arabia was located in a zone which, according to his own scheme, was extremely warm, and therefore did not possess all of the merits enumerated in the preceding paragraphs. He circumvents this painful actuality in a very ingenious manner by revealing the fact that the water which surrounds the Arabian peninsula has a cooling effect and the climate is really quite temperate. He thus makes his theory of the superiority of peoples in the middle latitudes square with his desire to show the supremacy of his own race, as was done by Aristotle for the Greeks, by Vitruvius for the Romans, and later by Bodin, Montesquieu and others for their respective countries.[43]

Khaldun holds that while it may be true that the black peoples of the south are descended from Ham, those of the middle or temperate climates from Shem, and those of the north from Japheth, this genealogy is nothing more than the statement of a fact of derivation and by no means explains why the peoples of different climates have different characteristics and habits. The characteristics of a people, he says, are not invariable but change with migrations; we can only understand why the peoples of the various climates and regions are different when we take into consideration their habitat and its reaction upon their mode of life.[44] This is a clear assertion that adjustment to environment is the basis of race differentiation, and Khaldun here foreshadows the position of the monogenists of the nineteenth century, who in their turn anticipated the doctrine of evolution by accounting for the development of

[43] Ibid. pp. 169 ff.
[44] Ibid. pp. 173–4.

the different branches of the human race from a single stock through differential "environmental stimulation and reaction."

The effect of temperature on the pigmentation of the skin is discussed in a way that is ingenious, if not sound in the light of modern science. Khaldun says that many have accounted for the black skin of the negro on the basis of the curse of Ham by his father Noah, and have held that the curse to servitude also brought with it a change to a black skin on the part of Ham and his descendants.[45] This he says is an erroneous explanation based upon ignorance of the effect of climate upon the color of the skin. The story of the curse of Ham is given in the Pentateuch and yet there is no mention of any change of color in this account. It is the intense heat of the vertical rays of the sun which gives a black complexion to the inhabitants of the torrid zone, and he substantiates his statement with the assertion that when negroes take up a permanent abode in a temperate climate they become white in due time and that when white men live permanently in a torrid zone they become black. This proves, he says, that pigmentation depends upon heat.[46]

The advent of Khaldun marks very clearly the beginnings of a transition into a new era of thought, even though traces of Aristotelian influence are not lacking in his writings. The Romans had added but little to the theories of the Greeks; Aquinas had little more than restated the opinions of Aristotle. But the peculiar position of Aristotle as the fount of almost everything worth

[45] Khaldun, op. cit. p. 170.
[46] Ibid. p. 172.

knowing in medieval times could not hold back the flood of new ideas which now began to pour in from all sides. Europe was coming into contact with outside culture, and though the prestige of Aristotle persisted it could not exclude the new ideas from Arabia, Persia, Northern Africa, China, and other outlying lands. The discovery and travel which were to produce the Commercial Revolution were beginning to bring Europe into contact with other lines of thought and with new sources of information, so that it was no longer necessary to depend entirely upon such thinkers as Hippocrates and Aristotle. If the medieval mind had no capacity for independent thinking, it could and ultimately did profit from this new diffusion of culture.

CHAPTER IV

CLIMATIC INFLUENCES: EARLY MODERN THEORIES

IN the works of the French political philosopher, Jean Bodin,[1] is found the first systematic discussion of the influence of geographic environment upon human society. The treatment of the subject by previous writers had been rather incidental to other interests; Bodin avowedly made a systematic analysis of the problem with the idea of finding a general law for the guidance of statesmen.[2] There is little that is original, however, in any of his contributions, for he chiefly made use of classical traditions in which there was an increased interest in his time owing to a newly awakened enthusiasm for classical writers, and he quotes with approval from Hippocrates, Plato, Aristotle, Strabo, Polybius, Livy, Vitruvius, Galen and Vegetius, among others.[3]

Bodin's environmental theories are found in his *Commonwealth*[4] and in his *Methodus,* an earlier work.[5] The discussion in the *Commonwealth* supplants the earlier treatment, though there is no great difference be-

[1] 1530–1596.

[2] Cf. Meuten, op. cit. p. 54. See also A. H. Koller, *The Theory of Environment*, Menasha, Wis., 1918, pp. 15–21.

[3] For Bodin's intellectual outlook see E. Fournol, *Bodin, Prédécesseur de Montesquieu*, Paris, 1896, chap. i. See also Meuten, op. cit.; W. A. Dunning, *A History of Political Theories from Luther to Montesquieu*, chap. iii; and H. J. L. Baudrillart, *Jean Bodin et son temps*, Paris, 1853.

[4] Bk. V, chap. i.

[5] *Methodus ad facilem Historiarum cognitionem.*

tween the two in any essential matter. In the later work under the caption "What order and course is to be taken to apply the form of a Commonwealth to the diversities of men's humours, and the means how to discover the nature and disposition of the people," he says that the failure of statesmen to take into consideration the character of the population in forming laws has often led to trouble, and even to the downfall of the states.[6] Further on he asserts that historians and philosophers of all time have called attention to great differences in populations from the effect of climate and location.[7] "Therefore a wise governor of any Commonwealth must know their humours before he attempts anything in the alteration of the state and laws. For one of the greatest, and it may be the chiefest foundation of a Commonwealth is to accommodate the state to the humour of the citizens, and the laws and ordinances to the nature of the place, persons, and time."[8] Having formulated this principle, he proceeds to investigate the question of the influence of the geographic environment upon various human groups to the end that he may furnish the statesman with the needed information.

Bodin divided the world into climatic zones with a precision that surpassed even Khaldun. Beginning with the equator, he marked off three zones on either side, each being thirty degrees in width. Populations south of the equator are not discussed. Those living in the zone nearest the equator in the northern hemisphere are referred to as the southern peoples, or the inhabitants of the burn-

[6] *Commonwealth*, translated by Richard Knolles, p. 545.
[7] Ibid. pp. 545–7.
[8] Ibid. p. 547.

ing regions; those occupying the middle zone in the northern hemisphere are called the dwellers in temperate climates; those in the zone farthest north are called the inhabitants of the cold regions.[9]

Before discussing his theories of the nature of the peoples occupying each of these zones, it will be necessary to make a brief survey of his astrological and physiological beliefs, for these underlie his whole scheme. He held that the peoples of the southern zone are dominated by Saturn and Venus, and are therefore inclined towards contemplation on the one hand and toward lust on the other. The inhabitants of the middle regions are ruled by Jupiter and Mercury, and in consequence they are powerful and agile. Mars and the moon are the sidereal influences in the north, and, as a result, the people there are inclined toward war and hunting, are strong in body but wanting in intelligence.[10] Bodin frankly accepted the ancient doctrine that climate affects the "humors" of man, which in turn determine human characteristics. In the northern climate phlegm becomes the predominating vital fluid, and the people are therefore heavy and dull with a high degree of internal heat to counteract the cold from without. In the hot southern regions the people are of a melancholic temperament due to the predominance of black bile, and are therefore constant and grave, and are cold internally to offset the external heat. The peoples in the middle regions are of a mixed temperament varying from a sanguine temperament in the northern part, where blood is the chief vital fluid, with the resulting characteristics of strength

[9] *Commonwealth*, p. 547.
[10] Ibid. pp. 561–2.

and cheerfulness, to a choleric temperament in the south where yellow bile predominates, resulting in a greater tendency toward activity and nimbleness.[11] . Upon this fantastic foundation he proceeds to ascertain the characteristics of various peoples as affected by their geography operating through these curious astrological and pseudo-physiological channels. His analysis is highly ingenious, granting his premises, and is reinforced by a considerable amount of historical data. In fact, when his theories are summarized by writers who do not reveal his fundamental explanations, they sound quite plausible.

The following summary will indicate the characteristics which Bodin assigned to each of the three groups of peoples and will also show some of his inconsistencies. Northern peoples he found to be on the whole faithful, loyal to the government, cruel because of their lack of judgment, and comparatively indifferent to sexual indulgence.[12] In one place he mentions their constance, but in another describes them as fickle and changeable like young men. Laws among the northern peoples have to be administered by the sword, a statement hard to reconcile with the assertion that, being warlike, they prefer a degree of popular government and that they especially prize liberty.[13] They readily abandon one religious faith for another; are deceptive because of distrustfulness which is due to lack of wit [14] and they are intemperate, needing much drink to cool their inward heat.

The traits of the southern people are in general the op-

[11] Ibid. pp. 554 ff.
[12] Ibid. pp. 555–9; *Methodus*, p. 143.
[13] *Commonwealth*, p. 563.
[14] Ibid. p. 567; *Methodus*, p. 94.

posite of those observed in the north.[15] They are malicious and crafty like foxes;[16] their melancholy inflames their passions, making them excessively cruel, and it creates the need for much relaxation, without which they go into a frenzy and even succumb to insanity.[17] Being under the sign of Scorpio and the planet Venus they are jealous of their women, and licentious in desires. Polygamy is common, indicating the preponderance of women in the population.[18] Bodin thinks the southerners are wise and discreet,[19] but says that they manifest extremes of conduct.[20] Their melancholy makes them wise and conduces to longevity. They are courteous, but deceptive because of a lack of spirit.[21] They are contemplative like old men, religiously inclined and expert in science, but ill adapted to political activity.[22]

The people of the temperate regions have a happy combination of the good qualities of both extremes, and so preserve a proper balance.[23] They are not cruel like the others.[24] While the people of the south are melancholy in humor, therefore cold and dry—the quality of old age, and the northerners phlegmatic—thus hot and moist like adolescence; so the people of the middle regions are of a sanguine and choleric humor, like people of middle age.[25]

[15] *Commonwealth*, p. 567.
[16] Ibid. pp. 554, 559.
[17] Ibid. p. 556.
[18] Ibid. p. 562.
[19] Ibid. p. 556.
[20] Ibid. p. 556.
[21] Ibid. pp. 562–567.
[22] Ibid. pp. 559–561.
[23] Ibid. p. 550.
[24] Ibid. p. 555.
[25] Though slightly inconsistent with the strict theory of the humors, this scheme serves its purpose well enough.

People of the temperate regions are truthful and reliable [26] and possess the greatest talent for government. They are suited to "negotiate, traffic, judge, plead, command, establish commonwealths, and to make laws for other countries." [27] So, as the people of the north with their force have produced military power, and the people of the south with their wisdom have given rise to science and religion, the people of the temperate regions have founded the greatest empires and established the sciences of politics and law.[28] Bodin thus explains how nature has designed France to be mistress of the world, much as Aristotle heralded the virtues of the middle region to establish the primacy of Greece, and as Vitruvius performed a like feat in the glorification of Rome.[29]

Bodin's discussion of longitudinal effects supplies an excellent illustration of the primitive foundation of his theories. He says that in moving in the direction travelled by the earth, that is from east to west (a reversal of the fact) the right hand is turned toward the north and the left hand toward the south.[30] The right part of the body is masculine as it contains the liver and gall, which reflects the influence of the moon and Mars, the patron celestial bodies of the north.[31] This agrees with the fact that there

[26] Ibid. p. 567.
[27] Ibid. p. 561.
[28] Ibid. p. 550.
[29] Cf. Philip of Commines (1445–1509) . . . "naturally all the English who have never left England are very choleric like all the inhabitants of cold countries. Our country is between the cold and warm countries, and thus we occupy cold and warm territory, and have peoples of two complexions. My opinion is that there is no country in the world better situated than France." *Memoirs*, IV, 6. This passage is quoted in Meuten, op. cit. p. 34 note.
[30] *Commonwealth*, p. 562.
[31] Ibid. p. 562.

are more men than women in the north. The left side of the body is feminine, having the heart, the spleen and the melancholy humor within it. Once more it follows that there are more women than men in the south, and the eastern people are gentle and courteous like the southerners.[32] Therefore, though there can be no fixed place for dividing the east from the west, it is, in general, true that the eastern peoples resemble the southern peoples, and those of the west resemble those of the north.[33]

As to the differences in population due to altitude, the higher the elevation, the more the people resemble those of the north—valiant and liberty loving—while valley dwellers are more like southerners—effeminate and lustful.[34] The inhabitants of valleys in the same latitude will resemble northerners if the valley turns toward the north and southerners if the valley turns toward the south.[35]

Bodin's real contribution lay not in the substance of his theories, which in the main were a collection of earlier doctrines on the subject, but rather in the extensiveness of his treatment, in his systematic consideration of the topic, and in his theoretical line of approach. His work sums up both the good and the bad characteristics of the ancient method of thought, mostly bad, for there was little of ancient astrology and physiological chemistry that was not hopelessly erroneous. In an occasional passage, however, we can discern the light of a new era of thought—the germ of observation and inductive study.

[32] *Commonwealth*, p. 562.
[33] Ibid. p. 562.
[34] Ibid. pp. 562–564.
[35] Ibid. pp. 562 ff.

Richard Mead [36] was the most famous physician in England at the beginning of the eighteenth century and his *Treatise Concerning the Influence of the Sun and Moon upon Human Bodies* [37] is of interest to us as it was probably the first attempt at a systematic study of the influence of atmospheric conditions upon the vital processes of the body. He was familiar with the great advances in physical science made during the interval between Bodin and himself, being particularly intimate with Halley and Newton. He therefore had a great advantage over Bodin in actual scientific knowledge. In addition, he succeeded in freeing himself from the superstitions of the past, to which Bodin had been so abject a slave. Astrology, he held, is only a blending of superstition and error with half-truth.[38] On the other hand, his treatment of the subject was much less comprehensive than Bodin's, being confined to a study of atmospheric influences, and more particularly to the relation of these influences to pathology. His treatise marks the beginning of a line of study which Dr. Dexter has recently shown to have such important possibilities.[39]

Mead attempted to show that the relation of the sun and moon to the earth with reference to "nearness and direction," has a direct influence upon the vital processes of the body in addition to the effects of heat and moisture.[40]

[36] 1673–1754.

[37] In *The Medical Works of Richard Mead*, Dublin, 1762, pp. 151–206.

[38] Mead, op. cit. p. 164.

[39] On Mead see the summary in the prefatory memoir to *The Medical Works of Richard Mead;* and F. H. Garrison, *History of Medicine*, Philadelphia, 1917, pp. 285, 395–6.

[40] Mead, loc. cit. pp. 164–5.

It was all a matter of atmospheric pressure. The atmosphere, he says, is a hollow sphere about forty-four miles in height, which surrounds the earth. It is made up of a thin elastic fluid, kept in equilibrium by the transference of pressure freely from one part to another. If the gravity of any part is lessened, the heavier air rushes in and restores the equilibrium.[41] Newton had traced the phenomena of tides to the attraction of the sun and the moon, and Mead considered it reasonable to trace changes in the atmosphere to the same cause. For these changes in the atmosphere take place at the same time and in the same order as those in the ocean, and air and water are subject to the same physical laws.[42] Moreover, after considering the difference in the attraction exerted by these two bodies upon the earth in their various positions in the heavens, he points out that their influence upon the atmosphere is much greater than upon the ocean, since the atmosphere is forty-four miles nearer to them than the ocean, and the attraction varies as the square of the distance.[43]

Mead held that differences in atmospheric pressure directly affect the human body. At the highest barometric pressure the weight of the atmosphere upon the average human body is about 33,684 pounds. At low pressure the weight is about 30,622 pounds, a difference of about 3062 pounds upon a single human body.[44]

These differences in pressure exert a marked influence upon the vital processes of man. Man requires a certain

[41] Mead, loc. cit., pp. 165, 168.
[42] Ibid. pp. 164–5.
[43] Ibid. p. 168.
[44] Ibid. p. 174.

gravity for efficient respiration, circulation and vitality. The elasticity of the air is diminished when the pressure is lessened, and, as a result, breathing is more difficult, as is noted in climbing a high mountain.[45] Finally, the fluids of the body contain elastic air, and when the pressure from without is lessened, there is an abnormal expulsion of internal gases, an example of which is seen in the swelling of an animal under an air pump.[46] The effect of these changes is naturally greatest on the weakest constitutions.[47]

Mead claimed that because of its extreme sensitiveness the effect of atmospheric changes upon what he called the nervous fluid or vital spirit of animals is greater than upon the blood or any other animal fluid. Therefore, the effect will be most marked in diseases of the nervous system, i. e., which arise from the action of the nervous fluid.[48] Epilepsy seems to be influenced by the moon, the attacks occurring at new and full moon when the attraction of the sun and moon is greatest.[49] The ravings of lunatics and hysterical disorders in women follow lunar periods, and the same applies to attacks of palsy.[50] He further asserted that ulcers get worse monthly, that nephritic paroxysms obey lunar attraction, and that even epidemic diseases depend largely upon lunar influences.[51] He considered therefore that the position of the moon is of value in predicting the time of crises in certain diseases, and that

[45] Ibid. p. 173.
[46] Ibid. pp. 173–4.
[47] Ibid. p. 174.
[48] Ibid. p. 177.
[49] Ibid. pp. 177–9.
[50] Ibid. pp. 180–1.
[51] Ibid. pp. 181–3, 187–8.

physicians could increase their efficiency by paying attention to these atmospheric changes.[52]

Mead refuses to commit himself as to whether the "Creator" arbitrarily sends storms and hurricanes upon man as a punishment irrespective of meteorological laws. "For though I am thoroughly convinced that each part of the universe is constituted and moved by certain laws; and that the same disposition of the fabric, which is the most convenient for the whole, sometimes brings inconveniences and even destruction in some particular places; yet it is highly equitable that the Omnipotent Creator should be allowed to have an absolute dominion over all his works."[53] He thus takes a position midway between credulity and scepticism.

Despite his crudities, Mead grasped the fact of the influence of atmospheric changes upon the human organism, and he was correct in asserting that such changes primarily affect the nervous system. He discarded astrology and the bulk of the ancient Greek physical philosophy which Boyle had shown to be erroneous. Finally, he marks a distinct advance over Bodin by conceiving of nature as operating according to fixed laws, though he saved himself from excessive clerical disapproval by reserving to the Creator the privilege of taking arbitrary action if He saw fit to do so.

Another famous English physician, a contemporary of Richard Mead, produced a more comprehensive study than Mead's on the influence of the atmosphere and its changes upon man's mental and physical traits. This was John

[52] Mead, loc. cit., pp. 187, 193–7.
[53] Ibid. p. 206.

Arbuthnot, whose work entitled *An Essay concerning the Effects of the Air on Human Bodies* appeared in 1733[54] Arbuthnot acknowledges his indebtedness to Hippocrates, but tries to explain the Hippocratic theories on the basis of the more recent chemical and physiological discoveries rather than by the use of the crude Greek physiological chemistry. He says in one place regarding Hippocrates, "Thus far I have ventured to explain the philosophy of this sagacious old man by mechanical causes arising from the properties and qualities of the air."[55]

Arbuthnot first makes a chemical and physical examination of the air and then discusses heat, cold, dryness, and moisture, which he calls "properties" of the air. He then tries to ascertain how these "properties" vary with different localities and seasons, and finally discusses the effect of the air on the body in respiration and in various diseases. It is a very remarkable work for its time. His procedure is scientific, resting upon evidence from actual observation, and he states his generalizations tentatively as awaiting further investigation.

Changes in barometric pressure, Arbuthnot finds, greatly affect the vitality of individuals as is seen in descending into a mine or going to the top of a mountain.[56] Heat, likewise, has a very definite effect upon the fibres of the body:

> A certain degree of heat, not strong enough to dry or destroy animal solids, lengthens and relaxes the fibres, from whence proceeds

[54] A French translation appeared in 1742; Montesquieu is thought to have used this edition in the preparation of his *The Spirit of Laws*. The citations given here are from the London edition of 1751, with spelling modernized.

[55] Arbuthnot, op. cit. pp. 152–3.

[56] Ibid. pp. 40–42, 74–75.

the sensation of faintness and debility on a hot day: the effect above mentioned of the relaxation of the fibres, and the expansion of the fluids by heat, are evident to the sight and touch, for the outward parts of human bodies swell and are plumper in hot weather than in cold.[57]

Cold air also has a direct effect upon bodily fibres:

Cold condenses the air proportional to the degree of it; it contracts animal fibres and fluids which are denser as far as the cold reacheth. In cold weather animals are really of less dimensions. Cold braceth the fibres, not only by its condensing quality, but likewise by congealing the moisture of the air, which relaxeth. Extreme cold works on human bodies as a stimulus, producing at first a pricking sensation, and afterwards a glowing heat or a small degree of inflammation in the parts of the body which are exposed to it. By bracing the fibres more strongly, condensing the fluids, and stimulating, it produceth strength and activity, which is very sensible in clear frosty weather.[58]

Many other effects are attributed to heat, cold, moisture, dryness and gravity:

It seems agreeable to reason and experience, that the air operates sensibly in forming the constitutions of mankind, which are found to vary much in different countries and climates.[59]

Arbuthnot finds that northern people tend to be strong and aggressive, like most people on a cold day, and that southern people are lazy and indolent, like people on a warm day.[60] A general type of features seems to be generated in a given climate or extended area, and a change of habitat

[57] Arbuthnot, op. cit., p. 48. cf. pp. 151–3, 170–1.
[58] Ibid. p. 56. cf. pp. 151–3 and pp. 170–171.
[59] Ibid. p. 146.
[60] Ibid. pp. 150–152.

will change these features.[61] The temper and disposition of individuals changes with variations of the air.

> People of delicate nerves and movable spirits are often joyful, sullen, sprightly, dejected, hopeful, despairing, according to the weather; and these changes happen but pass unnoticed in stronger constitutions. There are days in which the intellectual faculties of memory, imagination, judgment, are more vigorous; therefore it seems probable that the genius of nations depends upon the characteristics of their air.[62]

The adaptability of peoples to different occupations is found to vary with the climate and air. Laborious pursuits of the body are most congenial in cold countries, and the use of the reason and imagination are most agreeable to those in the warm countries.[63] That climate and air produce uniform physical qualities may be seen from the fact that the dominant traits of a locality remain even though the race may change.[64] Governments, Arbuthnot says, are powerless to change the "genius and temper of a race" against the force of air and climate.[65] "Despotic governments, though destructive of mankind in general, are most improper in cold countries; for where great labor is necessary, the workman ought to have a certain title to the fruits of it. There are degrees of slavery, and, generally speaking, it is most extreme in some hot and fruitful countries."[66] Man, he finds, has a far greater climatic adaptability than most animals, though the desire for a congenial

[61] Ibid. pp. 146–7.
[62] Ibid. p. 148.
[63] Ibid. pp. 148–149.
[64] Ibid. pp. 149–150.
[65] Ibid. pp. 149–150.
[66] Ibid. p. 153.

climate is one of the causes of the great migrations of men. Language is affected also. The people in cold climates being averse to opening their mouths too wide, have languages abounding in consonants, while the inhabitants of warm countries who are glad to open their mouths wide, have languages with an abundance of vowels.[67]

It is interesting to trace the influence of Arbuthnot's theories upon the work of Montesquieu. Says Dedieu:

> Arbuthnot held that in warm climates the fibres are relaxed. The inhabitants are submissive; they are fit subjects for slavery. Their passions are intense; domestic conditions there are unique. The spirit of slavery prevails in these regions. The fibres are contracted in cold climates. The inhabitants are hardy; they live under the rule of liberty. Their sensations are moderate; woman lives happily there. The spirit of liberty is their chief possession. The character of individuals, the character of peoples, the spirit of nations, the forms of government—all these things are closely correlated. Montesquieu developed his theories, if not in the exact order, at least in the very spirit and method revealed by Arbuthnot.[68]

If one follows the trend of thought of this English physician and the French philosopher, he cannot but sense the close dependence of the famous chapters in the "Spirit of Laws" upon the "Essay on the Effects of Air."[69]

In another part of his work Dedieu gives some strikingly similar selections from Arbuthnot and Montesquieu which, he maintains, indicate clearly that the Frenchman's doctrine of climatic influences was taken directly from Arbuthnot. Here he mentions also the familiarity of Montesquieu

[67] Arbuthnot, op. cit., pp. 153–4.

[68] Dedieu, *Montesquieu et la tradition politique anglaise en France*, Paris, 1909, p. 222.

[69] Ibid. p. 221.

with the English literary circle in which Arbuthnot moved, and he points out Montesquieu's acquaintance with Arbuthnot's work as it existed in the French translation of 1742, which appeared six years before the publication of *The Spirit of Laws*.[70]

It is in his method of observation and induction that Montesquieu makes his greatest contribution to social science, a contribution which gives him preëminence in the transitional period of what is now called sociology, when it was throwing off its philosophical and deductive methods to take on slowly the spirit and methods of inductive science.[71] He reminds one more of Spencer or Sumner than of any of the members of the social contract school. His generalizations are illustrated by numerous reports of travelers in distant lands, such as Chardin, and while he may not have been very critical in his acceptance of these reports, his recognition of the new method of procedure marks a great advance.

Probably Montesquieu's greatest contribution to social philosophy lay in his physical interpretation of society. Bodin, as has been shown, had taken up the doctrine which Hippocrates, Plato, Aristotle and others had suggested, and had developed a physical interpretation of society based upon a difference in latitude and longitude, as well as altitude.[72] This work of Bodin's was accurate in a general way, and it was a remarkable attempt for his time, but it was based upon absurd physiological and astrological no-

[70] Ibid. pp. 209–225.

[71] Baron de Montesquieu (1689–1755), the French publicist, was perhaps the most famous political and social writer of the eighteenth century.

[72] W. A. Dunning, *Political Theories from Luther to Montesquieu*, pp. 112–114.

tions. Montesquieu took up the task, and while some of his generalizations are hasty, his treatment is the most extensive offered before the time of Ritter. He does not hold so closely to the matter of latitude and longitude as did some of his predecessors, but bases his conclusions upon climatic conditions wherever found.

The purpose of *The Spirit of Laws,* as stated by the author, is to show that in the framing of laws for the government of peoples a careful examination should be made into the nature of each population, and laws so framed as to be adapted in every way to the needs, customs and general character of the inhabitants.

> They (laws) should be in relation to the nature and principle of each government whether they form it, as may be said of political laws; or whether they support it as may be said of civil institutions.
>
> They should be in relation to the climate of each country, to the quality of its soil, to its situation and extent, to the principal occupation of the natives, whether husbandmen, herdsmen or shepherds; they should have relation to the degree of liberty which the constitution will bear; to the religion of the inhabitants, to their inclinations, riches, numbers, commerce, manners and customs. In fine, they have relations to each other, as also to their origin, to the intent of the legislator, and to the order of things on which they are established; in all of which different lights they ought to be considered.
>
> This is what I have undertaken to perform in the following work. These relations I shall examine, since all these together constitute what I call the "Spirit of Laws." [73]

In general, Montesquieu holds that the inhabitants of cold

[73] Montesquieu, *The Spirit of Laws,* Bk. I, chap. iii. Nugent's translation.

countries tend to be brave, vigorous, insensible to pain, devoid of sex passion and possessed of relatively strong physical frames and phlegmatic temperaments.[74] The people of warm climates are weak, timid, apathetic toward physical exertion, vivacious, sensitive to pleasure or pain, inordinate in their sexual indulgences, and utterly lacking in mental ambition.[75] He holds also that climate accounts for the immutability of the "religion, manners, customs and laws of the eastern countries," since the combination of a very sensitive nervous and mental organization with a great aversion to mental exertion makes it impossible for these people to change an impression once it is received.[76] In proportion as climate has rendered a people stubborn and willful, so are its laws found to be strict and tyrannical, but if it has made them mild and gentle their laws are found to be liberal.[77] Drunkenness increases in direct proportion to the coldness and humidity of a climate, and to distance from the equator, for in warm countries people must drink a large amount of water to offset the loss of moisture through perspiration, while in cold climates spiritous liquors are needed to prevent the congealing of the blood.[78]

The climate is held to have a marked influence also upon domestic and conjugal conditions.[79] The women of a warm country mature early, and being possessed of less wisdom

[74] Ibid., Bk. XIV, chap. ii.
[75] Ibid.
[76] Ibid. chap. iv.
[77] Ibid. chap. xv.
[78] Ibid. chap. x.
[79] Montesquieu gives credit to Sir John Chardin for much of his descriptive data. Chardin was a Frenchman who made two trips to Persia between 1665 and 1677, and later settled in England. His experiences are described in his *Travels in Persia* a highly valued early modern work on travels.

than their husbands are naturally inferior in status. As a result of this situation combined with the small cost of living [80] and the preponderance of females in warm countries, polygamy is common, while in cold countries monogamy is the rule. This principle, says Montesquieu, has hindered the progress of Mohammedanism in northern countries, and the development of Christianity in southern countries.[81]

Climate is found also to exert a marked influence upon political conditions. The people of the north being stronger, braver, and more vigorous than those of the south, easily conquer in war, so that where a warm country lies adjacent to a cold one, the warm country is sure to be conquered and subjected to the despotic rule of the northerners. But where there is no great disparity in climate between nations, conquests will be rare and liberty the rule. The history of Europe and Asia confirms this rule to a remarkable degree, liberty having been the rule in Europe, while Asia has been the scene of repeated conquests.[82]

When he points out how different factors have contributed to mold national character, how laws should in general conform to the distinctive characteristics of each nation, and the part which commerce plays in breaking down prejudices and introducing innovations, Montesquieu is directly in line with modern thought. It is here that he displays his remarkable insight into human nature by recognizing that manners and customs are things which have come into being after a long period of growth and that their nature is determined in a marked degree by the environ-

[80] Montesquieu, op. cit. Bk. XVI, chap. iii.
[81] Ibid., chap. ii.
[82] Ibid. Bk. XVII, chaps. ii–iv.

ment in which they develop. He was wise enough to see that absolute free will is a creature of the imagination and that individuals and nations have the general direction of their activities and progress conditioned by external circumstances.[83] As will be seen later, however, he admits that a nation may play some part in the molding of its own destiny.

Attention has already been called to Dedieu's contention that Montesquieu borrowed heavily from Arbuthnot for his theory of climatic influences. Some evidence of this may be seen in the passages below, which will serve also to illustrate Montesquieu's general method of procedure.

If it be true that the temper of the mind and the passions of the heart are extremely different in different climates, the laws ought to be in relation both to the variety of those passions and to the variety of those tempers.

Cold air constringes the extremities of the external fibres of the body; this increases their elasticity, and favors the return of the blood from the extreme parts to the heart. It contracts those very fibres; consequently it increases their force. On the contrary, warm air relaxes and lengthens the extremes of the fibres; of course it diminishes their force and elasticity.

People are, therefore, more vigorous in cold climates. Here the action of the heart and the reaction of the extremities of the fibres are better performed, the temperature of the humors is greater, the blood moves freely toward the heart, and reciprocally the heart has more power. This superiority of strength must produce various effects; for instance, a greater boldness, that is, more courage; a greater sense of superiority, that is, less desire for revenge; a greater opinion of security, that is, more frankness, less suspicion, policy, and cunning. In short this must be productive of very different tempers. Put a man in a close warm place, and for the

[83] Ibid. Bk. XIX chaps. iv–ix.

reasons above given he will feel a great faintness. If under this circumstance you propose a bold enterprise to him, I believe you will find him little disposed toward it; his present weakness will throw him into despondency; he will be afraid of everything, being in a state of total incapacity. The inhabitants of warm countries are, like old men, timorous; the people in cold countries like young men, brave. . . .

This strength of the fibres in northern nations is the cause that the coarser juices are extracted from their aliments. Hence two things result; one that the parts of the chyle or lymph are more proper; by reason of their large surface, that they are less proper, from their coarseness, to give a certain subtility to the nervous juice. Those people have therefore large bodies but little vivacity.

The nerves that terminate from all parts in the cutis form each a nervous bundle; generally speaking the whole nerve is not moved, but a very minute part. In warm climates, where the cutis is relaxed, the ends of the nerves are expanded and laid open to the weakest action of the smallest objects. In cold countries the cutis is constringed and the papillæ compressed: the miliary glands are in some measure paralytic; and the sensation does not reach the brain, except when it is very strong and proceeds from the whole nerve at once. Now imagination, taste, sensibility, and vivacity depend upon an infinite number of small sensations. . . .

This observation confirms what I have been saying, that in cold countries the nervous glands are less expanded: they sink deeper into their sheaths or they are sheltered from the action of external objects; consequently they have not such lively sensations.

In cold countries they have little sensation for pleasure; in temperate countries they have more; in warm climates, their sensibility is exquisite. As climates are distinguished by degrees of latitude, we might distinguish them also in some measure by those of sensibility. . . .

It is the same in regard to pain, which is excited by the laceration of some fibre of the body. The Author of nature has made it an established rule that this pain should be more acute in pro-

portion as the laceration is greater: now it is evident that the large bodies and coarse fibres of the people of the north are less capable of laceration than the delicate fibres of the inhabitants of warm countries; consequently the soul is there less sensible of pain. You must flay a Muscovite alive to make him feel.[84]

One cannot examine Montesquieu's theories without being profoundly impressed by the accuracy and modernity of his assertions. Passing from Hobbes and Locke who preceded him, and Rousseau who was to follow, to a consideration of Montesquieu, one feels that he is studying the work of a man who was advanced generations beyond them. In fact, he resembles Buckle more than he resembles the *a priori* philosophers of the seventeenth and eighteenth centuries. Such generally accepted truths as the relation between types of states and climatic situation, the civilizing aspects of great commercial activities, the love of liberty among mountaineers, the natural indolence of people living in a land of great fertility, the causes of migration, and the artificial alteration of environment are all set forth with great clearness. On the other hand, in the light of earlier environmental theories it is evident that Montesquieu really contributed little that was original, and that his innovations were almost entirely confined to his increased breadth of observation, his comparative method, and his relinquishment of many ancient misconceptions.

Buffon was convinced that racial differences are due to differences in environment.[85] Man, he held, was originally

[84] Montesquieu, op. cit. Bk. XIV, chaps. i–ii.

[85] Count Buffon was a distinguished French naturalist whose work, *The Natural History of Animals, Vegetables, and Minerals*, appeared in 1743. The edition used here is the translation by Kendrick and Murdock, London, 1775–6, six vols.

created of one type and has changed because of the effect of the different environments all over the world into which he migrated from his original habitat.[86] To man he attributed an adaptability to a greater variety of climates than he ascribed to any other member of the organic kingdom. In fact, if man were to leave the habitats into which he has migrated and return to his original haunts, he would in time take on his original form and color.[87] As white was the original color of man, a negro returning to a temperate climate would become white again in the course of a few generations.[88]

Herder's *Ideen zur Philosophie der Geschichte der Menschheit,* which appeared in 1784, was at that time the most important work on the philosophy of history.[89] It treated social evolution as a product of man's innate powers, *organische Krafte,* modified by his environment, the cultural setting of any age being embodied in tradition which is passed on and modified by succeeding generations.

[86] When man dispersed himself from climate to climate his nature underwent several alterations, which have been but slight in temperate countries bordering on his own climates; but have increased in proportion as the distance was greater and after many centuries have passed away, continents traversed over, and generations degenerated by the influence of the different countries, he sought the most extreme, and to people the sandy deserts of the south, and the icy regions of the north: the changes have become so great and so evident, that there is room to imagine, that the Negro, the Laplander, and the European form different species, if we were not assured on one side, that there was but one man at the creation, and on the other, that this European, Laplander, and Negro, although so different from each other, can unite and propagate together. Thus their colours are not original, their disresemblances being only external and their alterations of nature only superficial. It is also certain that they are all of one species, only differently tinctured, with black under the torrid zone; brown at the poles, and stunted in their growth by the rigor of the climate. Buffon, op. cit. Vol. IV, pp. 11–12.

[87] Ibid. Vol. IV, pp. 12–13.

[88] Ibid. Vol. I, p. 270.

[89] Flint, *The Philosophy of History in France and Germany,* pp. 375–384.

Social evolution is thus, according to Herder, an organic and unified process in which the spirit of mankind is the impelling force.[90]

In discussing the influence of environment, Herder confines his observations formally to the effects of climate, but his use of the term is usually broad enough to include the influence of other environmental factors. He held Hippocrates to be the best guide in this study because he examines many specific influences before making generalizations, but he does not revive Hippocrates' crude physiological theories. Herder's own treatment of climatic influences is careful and philosophic—admirable for his time both in method and viewpoint. He avoids sweeping generalizations and endeavors to weigh all the factors involved in any situation.

Herder first points out that "man is no independent substance," that he lives by breathing the air and consuming the products of the earth; in his every act he contributes "to the change of the universe" and must himself be changed.[91] He views man as one species, changed into varieties by the influence of different environments and modes of life, every nation which has long inhabited any region becoming adapted to its geographic conditions.[92] The customs, ideals, occupations and pleasures which they have known from birth are climatic. "Deprive them of their country and you deprive them of everything."[93]

[90] Johann Gottfried von Herder (1744–1803), a German philosopher and one of the founders of the romantic movement in Germany.

[91] Herder, *Outlines of a Philosophy of the History of Man*, trans. by T. Churchill, London, 1803, p. 293.

[92] Ibid. pp. 293 ff.

[93] Ibid. pp. 299 ff.

Increased knowledge of the conditions of life in the different climatic zones, says Herder, has greatly modified the ancient views based upon familiarity with only one small part of a zone.[94] One should not make generalizations regarding any zone without allowing for exceptions to the rule, for some particular geographic influence often gives "such a particular local qualification to the general law, that we frequently find the most opposite climates in places bordering upon each other."[95] Nor should sweeping generalizations be made regarding the influence of heat and cold upon the mental characteristics of a people, for while there may be a general rule, there are bound to be many exceptions.

Every one indeed knows, that heat expands and relaxes the fibres, alternates the fluids, and promotes perspiration. . . . This law remains incontestable on the whole; and in consequence, from it and its antagonist, cold, many physical phenomena have already been explained: but the general inferences from this principle, or from a part of it, as relaxation or perspiration for instance, to whole nations and countries, nay to the most delicate functions of the human mind, and the most accidental ordinances of society, are all in some measure hypothetical; and this the more, in proportion as the head that considers and arranges them is acute and sympathetic. They are contradicted almost step by step, by examples from history or even by physiological principles; because too many powers, partly opposite to each other, act in conjunction. It has even been objected to the great Montesquieu, that he has erected his climatic spirit of the laws on the fallacious experiment of a sheep's tongue. It is true, we are ductile clay in the hand of climate; but her fingers mold so variously, and the laws, that

[94] Herder, op. cit. p. 172.
[95] Ibid. p. 309.

counteract them are so numerous, that perhaps the genius of mankind alone is capable of combining the relations of all these powers in one whole.[96]

Climate, according to Herder, exerts a greater influence upon air and the delicate fluids than upon solids; upon the mass than upon the individual; its action is apparent only over long periods of time and it acts as a hardly perceptible predisposing influence rather than as a direct and invariable cause.[97] The fundamental force in human development is the genetic influence of organic life, whose action we can observe but cannot explain or understand. Climate, he says, can only aid or oppose this force.[98]

Foreshadowing the doctrine of Lamarck, Darwin, and Spencer, Herder held that while climate cannot change the species, it can, by slow and varied influence, cause within the species variations which are transmitted by heredity.[99] He cites specific examples of peoples whose characteristics had changed with a change of environment. He allows a place also for the relation of climate to the industries and activities of a people, holding that want has been the mainspring of human activity.[100] He also recognizes the influence of climate upon the relation of the sexes, holding that warm climates bring an earlier and more intense sexual desire, and that this has led to polygamy and the subjection of women in warm climates.[101]

The great geographer and explorer, von Humboldt, did

[96] Ibid. pp. 310–311.
[97] Ibid. p. 317.
[98] Ibid. pp. 318 ff.
[99] Ibid. p. 330.
[100] Ibid. pp. 363–374.
[101] Ibid. pp. 379 ff.

not contribute much in the way of climatic theories, but he furnished descriptive data of immense value to anthropo-geography. He also put meteorology on a scientific basis when he distinguished for scientific purposes the four important atmospheric attributes, (1) variations of pressure, (2) distribution of heat, (3) distribution of humidity, and (4) the electrical condition of the atmosphere, and he conceived the idea of isothermal lines.[102] His geographic studies, aside from what is purely descriptive, are concerned mainly with the relation of configuration and climate to the distribution of plant and animal life.

Humboldt repeats the tradition that the temperate zone has been most suited to the development of the human intellect and its control over the forces of nature. He gave some thought also to the problem of the relation of environment to race. He took the monogenist view that the human race is a single species divided into varieties by the differential action of various environments, and he is thus in line with the Darwinian doctrine of adaptation to environment.[103]

Adam Ferguson, the Scotch philosopher, devotes a chapter to the effect of environment upon social evolution and organization in his *History of Civil Society*.[104] The influence of Montesquieu and early writers is apparent, though dogmatism is not much in evidence in Ferguson's work. There is little that is strikingly original in his treatment. Some familiar traditions are repeated, including the

[102] Humboldt, *Cosmos, a Sketch of a Description of the Universe*, trans. by E. C. Otte, Vol. I, pp. 313–17.

[103] Ibid., pp. 351 ff.

[104] A. Ferguson, *An Essay on the History of Civil Society*, edition of 1768, Part III, sec. I.

notion that northern peoples are stronger in body and sounder in judgment; that southern peoples have a stronger imagination and a more developed sensual nature; and that man thrives best amid surroundings which place the greatest obstacles in his path.

Ferguson holds that while man has a wide range of adaptability to climate his development and his civilization have been most successful in the temperate zones.[105] The torrid zone has invented and developed little except mechanical arts and commercial pursuits.[106] In the cold regions the people "are dull and slow, moderate in their desires, regular and pacific in their manner of life," mercenary and servile in their nature. In warm regions the inhabitants "are feverish in their passions, weak in their judgments, and addicted by temperament to animal pleasures."[107] This trait with its accompanying seraglios and harems decreases in proportion as one recedes from the equator.[108] Like the people of extremely cold countries southern people are mercenary, untrustworthy and servile. The people of the temperate regions experience little difficulty in conquering the inhabitants of both warm and cold countries.[109] He admits, however, that while one can see from the characteristics of peoples in different climates that climate must affect them and give them certain definite traits, it is not known just how it brings about these results and we shall not know until we have a more complete knowledge of human physiology and anatomy.[110]

[105] Ibid. pp. 166 ff.
[106] Ibid. pp. 169 ff.
[107] Ibid. p. 171.
[108] Ibid. pp. 176–178.
[109] Ibid. pp. 172 ff.
[110] Ibid. pp. 179–180.

CHAPTER V

CLIMATIC INFLUENCES: LATE MODERN AND CONTEMPORARY THEORIES

IN German anthropogeography climatic influences have not received the same degree of attention that has been accorded such factors as position, topography, natural resources and area. Karl Ritter, probably the greatest figure in that field before 1850, testifies to the importance of climate, when he discusses other influences, by calling it the great reconciling power, but he offers no detailed analysis or explanation of its effects.[1] By its variations in every part of the earth it tends to harmonize other differences —to smooth over the rough places and the abrupt changes of environment. "This reconciling power has been given

[1] Ritter's chief contributions are brought together and translated in a volume entitled *Ritter's Geographical Studies* by William L. Gage, New York, 1861. Ritter's method of study is primarily objective and descriptive. Early in his work, he describes his procedure when he says that "the fundamental principle which can conduct us to the truth in the study of our subject as a whole, is to advance from observation to observation, and not from opinion or hypothesis to observation." And this observation is no easy matter, for the influences of nature are much deeper than they seem, "and the still power which nature exerts demands a like peaceful soul to watch its workings, and see that even to the very heart of its activity it always moves conformably to law." Nature is not only deep—she is elusive, and he must have infinite patience who would study her mysteries and know her ways. To one who is patient, however, and *en rapport* with nature, a rich reward is promised, for she will reveal "all the relations of that creation which we are wont to call the world of animate and inanimate nature, and give us clear convictions about all things which we investigate, and above all, about man." Op. cit. pp. 58–59, 86.

See also Alvin Wünsche, op. cit. pp. 75 ff.

to it that man might become the unconditioned master of the earth."[2]

Of the three outstanding figures between Ritter and Ratzel in the development of the newer geography in Germany, namely von Cotta, Kohl, and Peschel, only the last named emphasizes the influence of climate upon human society, and the influences he mentions are mainly indirect.[3] Peschel follows the tradition of the Arab geographers who held that all great philosophers and religious teachers were born between twenty-nine degrees and thirty-three degrees forty-nine minutes north latitude. Here were born Zoroaster, Moses, Buddha, Christ, and Mohammed.[4] In explaining the reasons for the development of great religious teachers in this zone Peschel sets forth his notions concerning the environmental stimulus of religious enthusiasm. He insists that a warm, rather than a temperate climate, favors that reflection which gives rise to religious sentiments:—

> In the cold of the temperate zone, man has always been obliged to struggle hard for his existence, working more than praying, so that the burden of the days labor constantly withheld him from deep inward meditation. In warm countries, on the contrary, where nature facilitates the acquisition of the necessaries of life, and the sultry hours of mid-day prohibit any bodily exertions, opportunities for mental absorption are far more abundant.[5]

[2] Gage, op. cit. p. 355.

[3] Oscar Peschel (1826–1875) was professor of geography at Leipzig, and a prominent follower of Ritter. See Hellwald, *Oskar Peschel, sein Leben und Schaffen*, Augsburg, 1876. Peschel's chief works were: *Geschichte des Zeitalters der Entdeckungen*, 1877; *Geschichte der Erdkunde*, 1865; *Neue Probleme der vergleichenden Erdkunde als Versuch einer Morphologie der Erdoberfläche*, 1870; *Völkerkunde* (1875), Eng. trans. "The Races of Man," N. Y. 1876; *Abhandlungen zur Erd-und Völkerkunde*, 2 Vols. 1877, 1879; *Physische Erdkunde* (posthumus), 1883–5.

[4] Peschel, *The Races of Man*, Eng. trans. New York, 1876, p. 315.

[5] Ibid. p. 316.

While a warm environment is better suited to the production of religious leaders than a temperate one, Peschel held that the ideal environment for the growth of religious systems, and particularly of monotheism, was a warm desert environment, for desert life exposes one to hunger and thirst and thereby produces abnormal mental conditions and an oversensitive imagination.[6]

Friedrich Ratzel has more to say about climate, though climatic theories by no means dominate his treatment of the subject of environmental influences.[7] They play an important rôle, however. "Lands, no matter how distant from one another they may be, whenever their climates are similar, are destined to be scenes of analogous historical developments."[8] He finds that climate affects man directly through its influence upon his body, mind and character, and indirectly through its effect upon the plants, the animals and the soil which are utilized by man.[9] While adapted types of man can endure every variety of climate, and man is the most adaptable of all animals to different

[6] Peschel, op. cit. p. 317.

[7] Friedrich Ratzel (1884–1904) was professor of geography at Leipzig from 1886 to the time of his death. His chief works are: *Die Vereinigten Staaten von Nordamerika* (1878–80), 2 Vols.; *Völkerkunde* (1894), Eng. trans. by Butler as *The Races of Man*, 3 Vols., (1896–8); *Die Erde und das Leben*, 2 Vols. (1901–2); *Politische Geographie*, (1897); *Der Staat und sein Boden* (1897); *Anthropogeographie*, 2nd ed. Vol. I (1899), Vol. II ed. by Frederich, 1912. The best summary of Ratzel's environmental theories is found in chapter iii of Volume I of the *Weltgeschichte*, a nine volume work of composite authorship edited by H. F. Helmolt. Here Ratzel gives his views of "man as a life phenomenon on the earth." This chapter was written near the end of his life, when he had available all of the data of his remarkable researches. References here and in later chapters are to an English translation of the *Weltgeschichte* entitled *The History of the World, A Survey of Man's Record*, ed. by H. F. Helmolt, London, 1901.

[8] *The History of the World, A Survey of Man's Record*, ed. by Helmolt, Vol. I, p. 64.

[9] Ibid. pp. 75–76.

climatic conditions, yet climate has affected all races in ways that have greatly influenced the course of history.[10] He agrees with Aristotle that everywhere the peoples of the temperate zone have proved superior in a political and military sense, as well as more advanced in culture, than the inhabitants of the frigid and torrid zones. Even in the temperate zone those dwelling in the colder portions are superior to those in the warmer districts, an opinion which he believes to be verified by the alleged superiority of the inhabitants of northern France, Italy, Germany and the United States over those who dwell in the southern parts of these states.[11] The most invigorating climate within the temperate zone is one where the isothermal lines group together, thus producing a region of varying and contrasting climates. But the divergence of the climate of contiguous districts may prove dangerous by making a permanent political union more difficult, for though general similarity of climate is not stimulating, it is conducive to economic uniformity and political unity.[12] Even winds are very significant as a phase of climate. The influence of the trade winds upon the development of commerce in the era of sailing vessels is well known. Progress is stimulated in regions of strong winds and great storms which cause frequent loss of life and property, thus intensifying the struggle for existence.[13] One of the most important of modern problems is that of acclimatization. The inhabitants of a state always prove most efficient and progressive in zones to which they have become adapted. The question of

[10] Ibid. pp. 76–79.
[11] Ibid. pp. 76–77.
[12] Ibid. pp. 78–80.
[13] Ibid. p. 78.

adaptability to new climates is a matter of prime political significance, for it is one of the determining factors governing the expansion of nations and the development of modern imperialism. An extremely significant fact in this respect is the difference in national or racial adaptability to acclimatization. For example, the Chinese and Jews are much more easily adapted to climatic variations than the Germans. Unfavorable climates not only tend to bring physical disease to newcomers, but also a loss of will power and other types of mental deterioration.[14]

Ratzel has become known to American and English readers mainly through the writings of his American pupil, Ellen Churchill Semple.[15] It is not too much to say that her book, *Influences of Geographic Environment,* is one of the most complete and scientific treatises on the subject in the English language. Her work is drawn upon in this and later chapters both because of its original contributions, and because of its greater accessibility to American readers interested in the theories of Friedrich Ratzel.

Miss Semple gives prominence, but not undue weight, to climatic influences, as did Ratzel before her. The influences of geographic environment are many and varied, and there has been a constant temptation, she says, especially among earlier writers, to emphasize one factor to the exclusion of others.[16] Climate directly influences the density of populations, and it has a direct bearing likewise upon health and

[14] Ratzel, loc. cit. pp. 78–79.

[15] Her *American History and Its Geographic Conditions,* which draws upon Ratzel's work on the United States, appeared in 1903. *Influences of Geographic Environment,* a critical revision and expansion of the first volume of Ratzel's *Anthropogeographie,* was published in 1911. English and American readers are thus under a heavy debt of gratitude to Miss Semple.

[16] Semple, *Influences of Geographic Environment,* pp. 11–12.

reproduction. Sparse populations are the rule in cold climates and dense populations in hot regions. The intense cold of the north has checked the growth of populations, and the heat and humidity of the south, aided by disease, exercise a selective influence upon peoples in tropical regions.[17] The question of acclimatization is of great importance. It affects both the character and the kind of work people can do, and it influences habitat, physical health, and social customs.[18]

"Climate enters fundamentally into all consideration of geographic influences, either by implication or explicitly." [19] It influences man directly through its effect on pigmentation, disease and energy; indirectly by determining the crops, animals, and general modes of life of a given locality.[20] It may even determine or influence topography, as in glaciation, erosion, and changes in drainage systems.[21] It determines the limits of human habitability, although man has a greater climatic adaptability than any other member of the animal kingdom.[22] It gives rise to commerce and other interactions between different areas and centers of civilization through its effect on the differentiation of peoples and modes of life.[23] In general, it determines the distribution of immigrants who seek a climate similar to the one they have left. Its effect upon the temperaments of races is marked as evidenced by the energy, thrift and seriousness of northern peoples, and the easy-going, emo-

[17] Ibid. pp. 7–10.
[18] Ibid. p. 36.
[19] Ibid. p. 607.
[20] Ibid. pp. 608–609.
[21] Ibid. pp. 609–610.
[22] Ibid. p. 610.
[23] Ibid. pp. 616–617.

tional natures in the south. All in all, the influence of climate upon the affairs of men is most profound both in its local variations and in the broader differences between the tropical, temperate and frigid zones. These broader differences are fundamental and their effects so obvious and lasting as to "give a certain zonal stamp to human temperature and development." [24]

Of the remaining German writers to be discussed in the present work, namely, Treitschke, Kirchhoff, and Goetz, only Treitschke emphasizes the effects of climate. This writer, whose intensely nationalistic views of history and politics contributed so largely to militaristic and nationalistic sentiment in Germany, devotes a chapter of his *Politics* to a consideration of the influence of geographic conditions upon the career and destiny of the state.[25] He sees "a certain manly earnestness" and "an inward contemplation" among northern peoples not possessed by southerners and attributable to sudden changes of season and the long severe winters. This notion of "an inward contemplation" being present in the north and absent in the south is a departure from earlier theories. He holds, moreover, that southern people are "soft and lazy" because of their mild climate and fertile soil, which fail to bring out the best that is in them.[26]

The implication that environmental conditions should be at least severe enough to demand forethought and effort

[24] Semple, op. cit. 633. For a good critical review of *Influences of Geographic Environment* see A. A. Tenney in the *Political Science Quarterly*, Vol. XXVII, 1912, p. 345.

[25] On Treitschke's influence see A. Guilland, *Modern Germany and Her Historians*.

[26] Treitschke, *Politics*, trans. by Dugdale and De Bille, Vol. I, pp. 209–210.

is frequently encountered in theories all the way from Hippocrates to Huntington. Treitschke also repeats Montesquieu's views on the relation between climate and sensuality, polygamy and slavery. Sensuality, he holds, accompanies idleness. Women mature earlier in the south, and the southerner, sensual by nature, is a natural polygamist. "Slavery is the accompaniment of the harem, and this leads to other political conditions which are incompatible with liberty." [27] He believes that the factory system and all modern industrial life is only possible in temperate climates.[28] Where the climate tends to produce a phlegmatic temperament, wine is indispensable, for it stimulates imagination and gaiety. England, he says, has suffered from the lack of a national use of wine, although her climate is favorable to the development of modern industry.[29]

The opinions of Julius Hann upon climatic and weather influences are brief and only incidental to his main interest in climatology, and it is to be regretted that the greatest of climatologists did not devote more attention to the subject which Dexter and others have shown to be such a fertile field for investigation.[30] The following passages summarize his views on the effect of humidity, barometric pressure and temperature:

Damp air, and increased pressure, have the following physiological effects:—nervous depression; quiet sleep, increased elimination of carbon dioxide; slower circulation of the blood. Dry air, and

[27] Ibid. p. 210.
[28] Ibid. pp. 209–210.
[29] Ibid. p. 211.
[30] "Hann was, without any question, the greatest climatologist who has ever lived. No one can possibly dispute his claim to that position." Robert DeC. Ward.

decreased pressure, on the other hand, have these effects:—nervous excitement; sleeplessness; quickened pulse, a drier skin, and a decreased temperature.

The physiological effects of changes in temperature vary according to the relative dampness or dryness of the air. When the relative humidity is high, a slight cooling is very noticeable and may also be injurious, while the reverse is the case when the air is dry. The inhabitants of deserts and of dry regions in general endure, without the slightest discomfort, great changes of temperature which would be very harmful in damper climates. As regards the physiological effects, therefore, changes of temperature are not alike in different climates.[31]

Of the late modern and contemporary French writers discussed in this work, only two give climatic influences more than a passing recognition. In the theories of such as Le Play, Demolins, Taine, Vallaux and Brunhes, climate is simply one factor, and in most instances not an important one. Only Reclus and Maury emphasize its influence upon society.

Climate has a very important effect, not only upon the people, but upon the type of government, according to Maury in his *La Terre et l'Homme*.[32] If it is warm the people are lazy and indolent without enough energy to desire freedom. If it is cold they are more energetic and active, the passions are less excessive, and reason has freer play. The violent passions of those who live in hot climates and their great tendency toward moodiness leads to apathy at one time, revolution at another. Tyranny is

[31] Julius Hann, *Handbook of Climatology*, translated by Robert DeC. Ward, New York, 1903, p. 57.

[32] L. F. Alfred Maury (1817–1892) was professor of History at *College de France* and was an archeologist of some renown. *La Terre et l'Homme* appeared in 1857.

therefore necessary for their well-being. Mountaineers and inhabitants of northern regions, on the other hand, love and are able to maintain freedom. Civilization, he holds, tends to become uniform with the growth of knowledge and means of communication, but he qualifies this important observation by asserting that climatic and geographic limitations tend to prevent complete uniformity.[33]

Elisée Reclus, the greatest of French geographers, was a pupil of Karl Ritter at Berlin.[34] Being a philosophical anarchist as well as a geographer it was only natural for him to emphasize the importance of environmental influences, for by so doing he was able to minimize the significance of the state and other artificial social institutions, an attitude which is basic in anarchistic doctrines. Without attempting any comparison between Reclus' ability and that of Ritter and Ratzel, it is safe to say that his work *L'Homme et la Terre* [35] is one of the most ambitious attempts ever made by an individual to present universal history in its geographical setting. Reclus possessed a very sensitive, elevated and independent mind and his works are as remarkable for their lofty and brilliant tone as for their scientific accuracy.[36]

[33] Maury, op. cit. pp. 549–551.

[34] Reclus (1830–1905), was banished from France in 1872 and did much of his writing in Switzerland.

[35] Paris, 6 Vols. 1905–1908.

[36] Good sketches of Reclus' life and characteristics are to be found by Kropotkin in the *Geographical Journal* for Sept., 1905, pp. 337–345; and by Patrick Geddes in the *Scottish Geographical Magazine* for 1905, pp. 490–496, 548–555 (pp. 553–555 of the latter contain a bibliography of Reclus' writings). His *Nouvelle Géographie universelle* is translated in an excellent English edition by Ravenstein and Keane as *The Earth and Its Inhabitants*, 19 Vols., N. Y. Appletons, 1884–1895. A good summary of Reclus' physical geography is to be found in *A New Physical Geography* by Elisée Reclus, edited by Keane, 2 Vols., N. Y. 1890. *L'Homme et la Terre* has never been translated into English.

Reclus divides his analytical treatment of environmental influences into a discussion of the factors of temperature, humidity, altitude, and the various topographical elements, such as forests, islands, swamps and lakes, river systems, and seas and oceans. Temperature, the primordial environmental influence, very largely determines the density of population, which varies roughly with the latitude, reaching zero in the polar regions.[37] Even the highest race is not independent of its influences, the white man, for example, being unable to exist readily in the arctic or antarctic zones without the artificial appliances of modern science; and even the native inhabitants of the polar regions have every aspect of their life, if not their very physical appearance, rigidly determined by the environment.[38]

The extremely hot zones, Reclus holds, do not exclude life of all sorts nor determine the mode of life with such rigidity. In most cases these tropical regions, which come very near to excluding life, do so not on account of the heat alone, but because of excessive humidity or dryness.[39] The heat of the tropics seems to have the psychological effect of producing more violent tempers than are found in other climates.[40] This is of course the old tradition handed down by Hippocrates, Aristotle, Bodin and Montesquieu.

As to the humidity and dryness of the air, Reclus holds that excessive variations from an ideal degree of humidity are unfavorable to life and social progress,[41] either ex-

[37] Reclus, *L'Homme et la Terre*, p. 42.
[38] Ibid. pp. 42–54.
[39] Ibid. p. 55.
[40] Ibid. p. 59.
[41] Ibid. pp. 55–56.

cluding inhabitants or determining absolutely their mode of life. Although extreme moisture of the soil is less effective, it seriously handicaps the development of a country, the inhabitants being compelled to adopt a very specialized mode of life, which, if it persists long enough is reflected even in their physique.[42]

Contemporary English writers, such as Geddes, Chisholm, Cowan, Fairgrieve, and Mackinder give scant consideration to climatic theories. In fact, except in the works of two earlier writers, Buckle and Spencer, direct climatic influences are little more than touched upon in the whole field of English anthropogeography.

In his unfinished *magnum opus, The History of Civilization in England,* Buckle discusses the effect of the physical environment upon the human race—his most important contribution to sociology.[43] At the outset he agrees heartily with John Stuart Mill that "of all the vulgar means of escaping from the consideration of the effect of social and moral influences upon the human mind, the most vulgar is that of attributing the diversities of conduct and character to inherent natural differences."[44]

In Buckle's treatment climate, soil, and food are bound almost inseparably together, and the greater part of it deals with what are really indirect effects of climate—to be taken up in the chapter on natural resources.[45] There is

[42] Ibid. pp. 59–68.

[43] Henry Thomas Buckle was the son of a wealthy London ship owner. He spent much of his early life in travel and labored untiringly upon his unfinished work from 1844 until just before his death in 1862 at the age of forty-one.

[44] Op. cit. pp. 29–30. On Buckle, see Alfred Henry Huth, *Life and Writings of Buckle,* 1880, and J. M. Robertson, *Buckle and His Critics,* 1895. Buckle's significance is reviewed also in Seligman's *Economic Interpretation of History.*

[45] See below, chap. vi.

no question, however, of his belief in direct climatic influences, distinct from the bounty of nature. He held that in the early history of a people the accumulation of wealth depends upon two things—the energy and regularity with which labor is applied, and the returns made to that labor by the bounty of nature. The energy and regularity of the labor in turn depends upon the climate. In a temperate climate the laborer is invigorated; in a hot climate he is filled with lassitude and generally unfitted for labor; in an excessively cold climate the people are prone to desultory habits, for "the chain of their industry, as it were, is broken" by the long seasons of cold when labor must be suspended.[46]

Some civilizations, according to Buckle, depend for their development primarily upon the soil as in Asia, and others upon climate as in Europe—in other words, the relative influence of climate and soil differs in various localities. Civilizations springing from the soil and beholden to the bounty of nature never reach the heights attained by those depending upon climate for their development. The only effective progress depends upon the energy of man, and the powers of man are not limited like those of nature. Climate reacts upon man, stimulating his energy and developing his powers. Therefore, that civilization conditioned by the development of human energy is bound to outstrip those which depend mainly upon nature alone and do not call forth the latent powers of man.[47]

Herbert Spencer took the position that "the characters

[46] Buckle, op. cit. p. 32.
[47] Ibid. pp. 36–7.

of the environment co-operate with the characters of the human beings in determining social phenomena."[48] What is designated in a single term as the physical environment is composed of many factors, each of which exerts an influence upon mankind. Life is possible, for example, only within certain limits of temperature.[49] In very cold climates where life itself is maintained only with the greatest difficulty, social evolution is impossible, as there is neither surplus energy in the individuals nor a sufficient increase of population to allow proper scope to variation and selection. Good examples of this are afforded by the Eskimos and the Fuegians.[50] Spencer, however, holds that natural heat is rarely sufficient to destroy or prevent life, and that the heat of the tropics, in spite of current theories to the contrary, does not seem to offer a serious obstacle to progress.[51] He finds, for example, that primitive men in temperate climates are often as indolent as primitive men in the tropics, and that many important civilizations have evolved in tropical or semi-tropical heat.[52] In fact, it appears to him that a tropical climate is absolutely necessary for the origin and early development of civilization. Admitting that in recent times the greatest civilizations have developed in temperate regions, he insists that the primary stages were reached in hot climates. The first feeble and uncertain steps had to be taken where the environment offered the least resistance, until, with ad-

[48] Spencer, *Principles of Sociology*, Vol. I, p. 35.
[49] Ibid. p. 17.
[50] Ibid. p. 18.
[51] Ibid. p. 19.
[52] Ibid. pp. 18–19.

vancement in the arts, and in methods of coöperation, subsequent societies were able to develop in regions where the resistance was relatively great.[53]

Almost equally important are the effects of humidity and dryness. Great dryness parches the earth, destroys vegetation, and prevents the multiplication of animal and human life, which is essential to progress. Dryness has an advantage, however, in that it aids evaporation from the skin and lungs and facilitates the bodily functions by expediting "the movements of fluids through the tissues and thus furthering molecular changes." From this Spencer infers that "there will be more bodily activity in the people of hot and dry localities than in the people of hot and humid localities.[54] This, he says, is verified by historical evidence, for the first great civilizations, like those of Egypt, Babylonia, Assyria and Phœnicia, developed in hot and dry regions, while from the great "rainless district" extending across northern Africa, Arabia, Persia, Thibet and Mongolia have come all the conquering races of the old world. The distinguishing trait of these peoples was not innate superiority, but greater energy.[55] In the new world the evidence is the same, for the great ancient civilizations of Peru, Central America and Mexico grew up in warm, dry climates.[56] Finally, Spencer holds that humidity and dryness affect pigmentation, in other words, the dryer the air, the lighter the skin and vice versa, and he thus accounts for the dominance of light skinned races in history—since the dry air produces both the lighter skin and

[53] Spencer, op. cit. pp. 19–20.
[54] Ibid. p. 21.
[55] Ibid. p. 22.
[56] Ibid. pp. 22–23.

the greater vigor which makes domination possible.[57] The light skinned and dominant Baltic race of cold, damp, northern Europe might be cited to disprove this theory, but it should be noted that Spencer is discussing only warm dry and warm humid climates.

Much of Spencer's environmental theory was presented in substance by earlier writers. Buckle, who preceded him, and Reclus, who followed, agree with him in distinguishing between physical and social environment, as did others, although Spencer emphasizes the part played by social environment more than most of them.[58] Spencer did not attempt to make a thorough-going study of environmental influences. His treatment is admittedly brief and "sketchy," and he frankly leaves the task to the "Sociologists of the future." His treatment of the problem, however, evidences a complete grasp of the questions involved, and the literature on the subject would be far richer than it is had he been able to devote sufficient time to all of its complexities and ramifications.

Arnold Henry Guyot, a Swiss geographer, did much to arouse the interest of the American people in the newer geography of Humboldt and Ritter.[59] He was the popularizer, and at the same time the scientific expositor of the doctrines of Ritter, though he placed greater emphasis than Ritter upon direct climatic influences. While somewhat

[57] Ibid. p. 23.

[58] See his *Principles of Sociology*, Vol. II, on "Ceremonial Institutions."

[59] Guyot came to America in 1848 and gave the Lowell lectures at Harvard. From 1854 to 1884 he was professor of geography at Princeton. His textbooks and wall charts did much to stimulate the study of geography in the United States.

For a biographical notice see the "Memoir" by James D. Dana in Vol. II of the *Biographical Memoirs of the National Academy of Sciences*, Wash. 1886.

mystical and theistic in its premises, his work is probably the most eloquent presentation of the relation between history and geography which has yet been produced.[60] Its dominating influences are the historical geography of Ritter and the philosophy of history of Hegel.

Guyot's chief contributions to anthropogeography may be summarized under the headings:—(1) a vivid statement of the superiority of a temperate climate as a stimulant of physical and social evolution; and (2) an analysis of what he calls the "geographical march of history."[61] His theories concerning the influence of geographic environment upon man were strongly colored by his semi-theistic premises. He conceived of the earth as the organic result of a purposive creation in which each continent had a certain part to play. His general position he summarizes in the following propositions:—

1. That the forms, the arrangement, and the distribution of the terrestrial masses on the surface of the globe, accidental in appearance, yet reveal a plan which we are enabled to understand by the evolutions of history.

2. That the continents are made for human societies, as the body is made for the soul.

3. That each of the northern or historical continents is peculiarly adapted, by its nature, to perform a special part corresponding to the wants of humanity in one of the great phases of its history.

4. Thus, nature and history, the earth and man, stand in the closest relations to each other, and form only one grand harmony.[62]

[60] Guyot, *Earth and Man, Comparative Physical Geography.*
[61] See chap. ix.
[62] Guyot, op. cit. 2nd revised edition, N. Y. 1876, p. 34.

While hot climates are far the best suited to the prolific development of all the forms of flora and fauna below the level of man, they are least adapted to the production of a superior type of human being. "It is in the hot region of the tropics that the life of nature displays its fullest energy, its greatest diversity, and its most dazzling splendors."[63] With man this is not so. The temperate zone has produced the most perfect human type and as we go towards the extremes of heat or cold we encounter inferior races of men:—

> While all the types of animals and of plants go on decreasing in perfection, from the equatorial to the polar regions, in proportion to the temperatures, man presents to our view his purest, his most perfect type, at the very center of the temperate continents, at the center of Asia-Europe, in the regions of Iran, of Armenia, and of the Caucasus; and, departing from this geographical center in the three grand directions of the lands, the types gradually lose the beauty of their forms, in proportion to their distance, even to the extreme points of the southern continents, where we find the most deformed and degenerate races, and the lowest in the scale of humanity.[64]

Guyot maintained that there is a close relation between racial superiority and the development of civilization. His statement of the generally accepted thesis that a temperate climate is best for the development of civilization because it is midway between the surfeit of the tropics and the scarcity of the polar regions is one of the classic passages in the literature of anthropogeography. He points out

[63] Ibid. p. 251.
[64] Ibid. pp. 254–55.

that a temperate climate stimulates the development of forethought and provident traits which are impossible in the tropics, and yet escapes the scarcity of the colder regions which allows no surplus energy for the development of civilization:—

> Since man is made to acquire the full possession and mastery of his faculties by toil, and by the exercise of all his energies, no climate could so well minister to his progress in this work as the climate of the temperate continents. It is easy to understand this.
>
> An excessive heat enfeebles man; it invites to repose and inaction. In the tropical regions the power of life in nature is carried to the highest degree; thus with the tropical man, the life of the body overmasters that of the soul; the physical instincts of our nature, those of the higher faculties; passion, sentiment, imagination, predominate over intellect and reason; the passive faculties over the active faculties.—In the temperate climates all is activity, movement. The alternations of heat and cold, the changes of the seasons, a fresher and more bracing air, incite man to a constant struggle, to forethought, to the vigorous employment of all his faculties.—Thus, if the tropical continents have the wealth of nature, the temperate continents are the most perfectly organized for the development of man. They are opposed to each other, as the body and the soul, as the inferior races and the superior races, as savage man and civilized man, as nature and history.[65]

In comparing the civilizations of India and China, Guyot revives an ancient notion regarding the influence of climate upon mental traits. The Hindoo, he says, is highly intelligent and contemplative, and has a deeply mystical religion. This he attributes to the influence of the tropical climate, which "gives to the intuitive faculties an exaggerated pre-

[65] Guyot, op. cit. pp. 268–271.

ponderance over the active faculties." The Hindoo lives in the clouds. "The real, positive world disappears from his eyes." [66]

Dr. John W. Draper attempted to prove that social evolution is subject to law in the same way as the physiological development of the human body.[67] He held that society, like the body, is profoundly affected by the physical environment, and particularly by climate. Incidentally it should be mentioned that he points out the relation between the changes in water supply in central and western Asia and the barbarian invasions of Europe by Asiatics, a problem which has been considered at length in recent times by Pumpelly and Huntington.[68]

All over the world physical circumstances control the human race. They make the Australian a savage; incapacitate the negro, who can never invent an alphabet or an arithmetic, and whose theology never passes beyond the stage of sorcery. They cause the Tartars to delight in a diet of milk, and the American Indian to abominate it. They make the dwarfish races of Europe instinctive miners and metallurgists. An artificial control by dwellings, warm for winter and cool for summer; variations of clothing to suit the season of the year, and especially the management of fire, have enabled man to maintain himself in all climates. The invention of artificial light has extended the available term of his life; by giving night to his use, it has, by the social intercourse it encourages, polished his manners and refined his tastes, perhaps as much as anything else has aided in his intellectual progress. Indeed, these are among the primary conditions that have occasioned

[66] Ibid. pp. 286–7.

[67] J. W. Draper, *History of the Intellectual Development of Europe*, N. Y. 1863. Dr. Draper, who did his most important writing during the civil war period, was a leading American scientist of his time.

[68] Ibid. p. 22.

his civilization. Variety of natural conditions gives rise to different national types, artificial inventions occasion renewed modifications. Where there are many climates there will be many forms of men. Herein, lies the explanation of the energy of European life, and the development of civilization.[69]

In his *History of the American Civil War,* a later work, Draper essays a theoretical discussion of the influence of physical agents upon mankind. In effect he places practically all environmental influences under the general category of climate which he defines as "all the circumstances natural and artificial in which we live."[70] He maintains that a direct physical and mental influence is exerted over man by the environment. Human types and traits change with every change of abode.[71] National character is determined by and closely associated with the climatic zone. As he states it: "For every climate, and, indeed for every geographical locality, there is an answering type of humanity. An intruder placed under such influences forthwith commences to undergo a corresponding modeling, which, though race peculiarities may retard, does not cease until the proper type is assumed. With the assumption of that typical form come habits and interests that pertain to it. With a special bodily organization comes a special and corresponding mental organization, and a disposition for determinate course of thought."[72] This view of history is of especial importance because it enables the student to prophesy the future course of political development. One can tell the probable future course of events in a given state

[69] Draper, op. cit. p. 26.
[70] Draper, *History of the American Civil War,* p. 80.
[71] Ibid. pp. 89 ff.
[72] Ibid. p. 110.

and society by studying the course of history in some previously existing state or society which inhabitated a similar physical environment.[73] Yet he does not believe man is wholly a slave to his environment as is seen in the first of the two passages quoted above; by a development of the arts of life man has been able to exert an artificial control over the physical environment.[74]

Draper's contributions to the subject of environmental causation were not extensive, but his general notion that historical phenomena are amenable to physical laws is intimately related to the basic premises of anthropogeography, and especially is this true of his view that response to environmental influences was one of the laws governing social and intellectual evolution.

A quarter of a century ago William Z. Ripley was a promising figure in the field of anthropogeography. Unfortunately for the development of that subject, however, he turned his attention first to ethnography and later to economics. He first attracted attention through a scholarly article on "Geography as a Sociological Study."[75] In this he traced the history of the recognition of the physical environment as an important factor in conditioning social processes and indicated in a moderate and critical manner the service which a scientific study of anthropogeography might render in producing a sounder and more comprehensive body of sociological theory. In conclusion he held that even if the new science does not become a "predictive science" it cannot be neglected. "One of its aims will al-

[73] Ibid. p. 111.
[74] Ibid. pp. 104 ff.
[75] *The Political Science Quarterly*, Vol. X, pp. 636–54. The essence of this article is reprinted as Chapter I of the *Races of Europe*.

ways be, in the words of Bastian, '*to discover whether the historical development of a people is in harmony with its environment, and if not, whether it is a plus or minus factor in progress.*' If it be modest in this wise, geography will soon establish its position as an essential branch of political and social study.''[76]

In his *Races of Europe* Ripley discusses the problem of acclimatization with reference to whether Europeans can become adapted to life in the tropics, a question of great political and economic import.[77] In analyzing the factors involved he displays the breadth of his view of environmental problems. The usual notion that the migration of northerners to the tropics involves merely a change of climate is a very incomplete and imperfect way of looking at the matter. The very change of residence in itself upsets habits, and this breaking down of habits is often as important a cause of such traits as alcoholism and sexual immorality as the fact of climatic differences.[78]

In discussing the effects of the tropical climate upon Europeans he agrees with Reclus that it is the excessive humidity, rather than the heat, which is the main barrier to permanent and successful European residence in the tropics.[79] Moreover, it is alleged that white inhabitants of the tropics develop sterility after about three generations of continuous residence.[80] French, Italians and Spanish show a far greater adaptability to colonization in the tropics than

[76] Ripley, loc. cit. p. 654.
[77] W. Z. Ripley, *Races of Europe*, 1900, p. 560.
[78] Ibid. pp. 561–563.
[79] Ibid. p. 571.
[80] Ibid. pp. 574–575; 580–581.

do the Teutonic nations.[81] The view that the white man may ultimately become acclimated to the tropics by virtue of a gradual adaptation to the new environment, even if it possess any validity whatever, has no practical significance at the present time. This sort of adaptation is so slow that it would occupy too long a time to give it any bearing upon the solution of present day problems.[82] On the whole, Ripley inclines to the view that the white man can never become truly acclimated to a tropical existence. He thus summarizes his conceptions in this regard:—

It must not be understood that by this is meant that the white man can not live in the tropics. Hygienic precautions and great care can often render a prolonged sojourn in these regions perfectly harmless. But, as Wallace observes, the Englishman who can spend a summer in Rome in safety only by sleeping in a tower and by never venturing forth at night, can not be truly said to be acclimated. A colony can never approximate even to the civilization of Europe until it can abolish or assimilate the native servile population; and yet, one of the many things which are expressly forbidden to all colonists in the tropics is agricultural labor. It would be a waste of energy to give citations to prove this, for every work on acclimatization insists upon the necessity of this precaution. Let it be understood, then, that a colonial policy in the tropics means a permanent servile native population, which is manifestly inconsistent with political independence, or with any approach to republican institutions.[83]

[81] Ibid. pp. 582–584.

[82] Ibid. p. 577.

[83] Ibid. pp. 586–587.

Benjamin Kidd takes the same view regarding any attempt to acclimatize the white man in the tropics, which he calls "a blunder of the first magnitude," adding that "all experiments based upon the idea are mere idle and empty enterprises foredoomed to failure." *The Control of the Tropics*, London, 1898, p. 48. Expressing substantially the same view as Kidd,

Albert Leffingwell's fundamental hypothesis is "that upon the nervous organization of human bodies (perhaps especially upon dwellers in the temperate zone) there is exerted during the procession of the seasons, from winter's close until midsummer, some undefined, specific influence, which in some manner tends to increase the excitability of emotion and passion, and thus also to increase all actions arising therefrom." [84] His method is one of statistical study and graphic demonstration, and the phases of human conduct examined include suicide, insanity, crimes of violence, duels, marriages, and births, particularly illegitimate births.

It is, perhaps, natural to suppose that suicide would be most frequent at the time of year when poverty and misery are most in evidence, namely, in the winter. Leffingwell, however, found it to be most frequent all over Europe during the spring and early summer, fully sixty percent of all cases in England and Wales occurring during the warmer seasons. Beginning in the early spring there would be a gradual increase in the number of cases until July, and then a steady decline.[85] The course of this suicidal tendency rose and fell with such regularity as to cause him to suspect that its resemblance to the rise and fall of a patient's temperature during fever might be "more than a

Mayo-Smith says: "Our statistics are not sufficiently accurate to indicate that it is impossible for Europeans to become permanently acclimated in the tropics, but they do show that it is a matter of extreme difficulty." *Statistics and Sociology*, New York, 1907, p. 132.

[84] Leffingwell, *Illegitimacy and the Influence of Seasons on Conduct*, London, 1892, p. 90. Leffingwell was an American physician who travelled extensively and devoted much of his life to scientific and literary pursuits. He is interesting, not only for the value of his doctrines, but as a modern representative of the line of physicians, who, like Hippocrates, Mead and Arbuthnot, have made important contributions to our subject.

[85] Op. cit. pp. 92, 95.

fancy'' and might even mean that ''suicide marks in truth the variations of life.'' [86]

In the matter of insanity and crimes of violence the situation was found to be the same. The number of admissions to hospitals for the insane, for example, rises in the spring, reaches its full height in the early summer, then steadily falls and remains below the average during the fall and winter.[87] Fifty-four percent of the murderous attacks in England and Wales were found to occur during the spring and summer, and the same increase is true of riots, revolutions and other popular outbursts.[88] There is likewise a marked increase in rape in the summer.[89] In fact, all crimes against the person were found to increase regularly during the warmer months, reaching fifty-five percent in England over a ten year period (1878–1887) and practically the same figure in France over a much longer period.[90]

A study of birth rates and marriages reveals a similar tendency. Illegitimate births increase at a time which indicates conception during the April–September period, and legitimate births show a like tendency.[91] Leffingwell is confident, also, that the seasons exert an influence upon the tendency toward marriage, but he lacks the evidence to prove it because, as he puts it, the tendency is usually repressed or diverted ''by considerations of policy, local prejudices, and the dictates of religion.'' [92]

[86] Ibid. p. 98.
[87] Ibid. p. 100.
[88] Ibid. pp. 107, 124. Cf. Cesare Lombroso, *Criminal Man* (ed. by G. Lombroso-Ferrero), New York, 1911, p. 145.
[89] Ibid. pp. 109 ff.
[90] Ibid. p. 114.
[91] Ibid. pp. 116 ff.
[92] Ibid. p. 122.

In seeking to explain just how the advent of spring stimulates what he calls the "unreasoning impulses," Leffingwell is conservative and makes the relatively safe assertion "that either by the gradual increase of solar light and solar heat, or else in some other manner quite mysterious at present, the breaking up of winter and the advent of spring and summer seasons, produces upon all animated nature a peculiar state of excitement or exaltation of the nervous system."[93] He surmises that the quantity of blood is actually increased and that the heart beats are stronger and more rapid, but because of insufficient evidence he goes no further.[94] He is certain, however, that an actual increase of nervous energy does manifest itself during the summer seasons.

The effects of this increased nervous energy are doubtless many and varied.[95] Sometimes they are too slight to be perceived except through statistical studies of conduct dealing with a large number of cases; sometimes they manifest themselves in melancholy, restlessness and irritability; sometimes in loftier ways, giving rise to poetry, love and patriotism. In those whose emotions are already unstable, a slight increase of nervous energy may be all that is needed to throw them off their balance, with a resulting increase of murders, assaults, suicide and other crimes of violence.[96]

Leffingwell's work is comparatively free from dogmatism and sweeping generalizations, and on the whole he manages to separate his facts from his fancies. Parts of his book

[93] Leffingwell, op. cit. p. 132.
[94] Ibid. pp. 132 ff.
[95] Ibid. pp. 132–135.
[96] Ibid. p. 135.

are highly suggestive and have anticipated more recent investigations, as, for example, his theories of solar energy and the influence of sun-spots.[97] The data upon which he bases his conclusions, however, usually cover but a few years, and he makes practically no allowance for the social factors involved. He failed to note that summer allows greater freedom of movement and social contact, and hence greater opportunity for and temptation to crimes against the person. The greater opportunity for social intercourse brings more excitement and may account in part for the increase of insanity. The fact that the sexes are thrown together more in the summer than in the winter, and with less supervision, is doubtless a factor in the increase in the amount of rape and of illegitimate conception during the warmer seasons. One could readily believe that purely social considerations might account for the slight increase in homicidal attacks in England and Wales during the spring and summer, for much of the increase in rape and illegitimate conception, as well as the increased tendency toward riots, insurrections, and other popular outbursts. Dr. Lef-

[97] "One summer's day the opportunity was mine to look through a telescope at a large spot on the sun. Into that dark chasm our planet might drop, without even touching the edge of flame on either side. That may yet be its fate. But even now, it is not impossible that what we call 'a mere sun-spot' in midsummer may have some influence, in our little world, upon the ebb and flow of passion, the excitement of emotion, and all that makes up the profound mystery of human life." Ibid. pp. 137–138. cf. E. Huntington, *Earth and Sun.*

As early as 1875 a relationship between sun-spots and the price of grain was surmised by W. Stanley Jevons, the British economist, who developed the idea with great caution during the four years following. Finally, in his "Commercial Crises and Sun-Spots," published in 1879, he came out boldly in defense of his theory and expressed the conviction that there is a causal connection between the sun-spot periods of eleven years and the commercial crises which recur at intervals of about the same duration. Jevons's papers on this subject are contained in his *Investigations in Currency and Finance,* London, 1909 (ed. by H. Stanley Jevons) pp. 175–221.

fingwell's work would have been greatly strengthened had he given greater weight to the social factors involved in the phenomena under discussion.[98]

One of the most novel and interesting of recent attempts to discover the effect of environmental influences upon human behavior is Edwin Grant Dexter's study of the effect of weather conditions upon conduct.[99] Dexter makes it clear that he is merely concerned with the effect of those temporary atmospheric changes known as weather conditions, and he contends that a study of weather influences is valuable because the weather is universal in its operation upon the inhabitants of any given community.[100] He does not claim, however, that weather influences are direct determiners of conduct, but holds that they are important contributory factors affecting behavior.[101]

Dexter maintains at the outset that his method of procedure is purely inductive and aims merely to discover if there is any definite correlation between meteorological conditions and certain types of normal and abnormal behavior:—

> The method followed is purely an inductive one and consists of a comparison of the average daily occurrence of certain recorded

[98] Says Mayo-Smith: "It is pretty well determined that crimes against the person are more numerous in summer than in winter; that crimes against property are more numerous in winter than in summer. Various reasons for this have been given. That such crimes against property as larceny should be more frequent in winter than in summer may, perhaps, be explained by the greater pressure of economic wants in the cold season. But it is not easy to explain why crimes against the person, and especially those against morality, such as rape, should be more frequent in summer than in winter. Some authors ascribe it to the influence of the season, others to the greater opportunity, owing to the out-door life of the agricultural population." Op. cit. pp. 271–2.

[99] E. G. Dexter, *Weather Influences, An Empirical Study of Mental and Physiological Effects of Definite Meteorological Conditions*, New York, 1904.

[100] Op. cit. pp. 56–57.

[101] Ibid. pp. 91–92.

abnormalities of conduct, with their occurrences under definite meteorological conditions. The data of conduct considered were mostly taken from the records of the New York City Coroner, Chief of Police, and Superintendent of Schools, and consisted of the daily record of suicides, both successful and attempted, of arrests for assault and battery and drunkenness, and of deportment in the City Penitentiary and certain of the public schools; in all, over 600,000 separate occurrences, covering a period of ten years. The meteorological data for comparison were taken from the records of the New York, and Denver, Colorado, stations of the United States Weather Bureau.[102]

In his attempt to establish correlation between weather conditions and human behavior Dexter studies, in their relation to the data of conduct, six fundamental meteorological conditions: temperature, barometric pressure, humidity, wind, character of the day, precipitation.[103]

An examination of the deportment of children in the public schools of New York and Denver led to the conclusion that deportment is best during the winter months and at the beginning and end of the school year, and in general, when the temperature is either extremely low or extremely high, the barometer high, humidity great and the days calm, cloudy or wet.[104] Attendance proved to be best during the spring and autumn months, during days of mild temperature, when the barometrical pressure is moderate, during moderate humidity and wind conditions, and while the days are fair and dry.[105]

Dexter's analysis of the relation between criminal be-

[102] Ibid. p. 58.
[103] Ibid. pp. 75–86.
[104] Ibid. pp. 112–140.
[105] Ibid. pp. 102 ff. 140.

havior and weather conditions revealed equally interesting correlations. Cases of assault and battery in New York City were most numerous in the warmest months, the periods of low barometer, at a time of low humidity, during calms, on clear days, and during periods of least precipitation.[106] Murders in Denver were found to be most frequent under warm temperature, low barometer, low humidity, during winds, upon cloudy days, and during periods of some precipitation.[107] The deportment of the inmates of the New York City Penitentiary showed an excess of disorder during the coldest periods and under temperature conditions of seventy-five degrees and above, under conditions of low barometer, and in a period of low humidity and clear, dry days.[108]

Arrests for insanity in New York City were most frequent in very warm periods, especially in a time of great heat, in periods of low barometer, low humidity, during winds, on fair days, and especially on dry days.[109] Sickness and death were most prevalent in winter and early spring, during the hot waves of the summer and during extremely low temperatures, during periods of low barometer, in times of high humidity, in calms and extremely high winds, on cloudy days, and in periods of considerable precipitation.[110] Suicide was most frequent in the late spring and the late summer, in a temperature of from forty-five to seventy degrees, during periods of low barometer, at a time

[106] Dexter, op. cit. pp. 143–154.
[107] Ibid. pp. 155–158.
[108] Ibid. pp. 160–165. It appears that the unusual amount of disorder during the winter months is due in part, at least, to a lack of facilities for exercising the inmates.
[109] Ibid. pp. 171–176.
[110] Ibid. pp. 180–197.

of high humidity, during winds, and on clear, dry days.[111] Drunkenness appeared most excessive during the cold months and low temperatures, during high barometrical pressure, in a period of high humidity, during high winds, and upon almost any kind of a day not seriously involving any of the above disturbing influences, though it seemed to be slightly more frequent on clear, dry days.[112]

In attempting to establish a correlation between the degree of concentration of attention and weather conditions, Dexter found that the errors of bank clerks seemed to be most numerous in warm months, during periods of very high temperature, during a period of moderate barometrical pressure, under conditions of high humidity, during calms, and on cloudy, wet days; while the Columbia students show a quicker discrimination during high temperatures, high barometrical pressure, high humidity and winds, and upon cloudy, wet days.[113]

In summarizing the effect of all the weather conditions studied upon the various types of behavior under investigation Dexter makes the following generalizations. Behavior which denotes a stimulation of activity is most quiescent during the colder months, most prevalent in the hottest period of the year, and generally declines from summer to winter. Sickness and drunkenness vary inversely with an increase of temperature, and crime and insanity directly. As to barometric pressure not only the active but the passive types of behavior seem to be stimulated during periods of low barometer. Humidity represses all forms of ab-

[111] Ibid. pp. 201–218.
[112] Ibid. pp. 230–232.
[113] Ibid. pp. 245–246.

normal activity including suicide and stimulates intoxication and mental carelessness and inattention. Winds stimulate vitality and calms seem to produce an excessive amount of those types of abnormal conduct caused by depleted vitality. Finally, all types of conduct studied, except clerical errors, sickness and death, seem to be more frequent on fair days than on cloudy ones.[114]

Dexter thus summarizes the significance of his study for sociology and applied psychology. Weather conditions have a direct, if varied, effect upon the metabolism of life. Especially important is the influence of meteorological changes upon that reserve energy which is utilized for intellectual processes and activities other than those of the vital organs. The effect of weather conditions upon this reserve energy is even more important than its direct influence upon the emotional states. Those weather conditions which produce misconduct are also those which are most stimulating to health and mental alertness; misconduct being primarily the product of an excess of reserve energy which is not utilized in some truly social manner.[115]

It should be noted that Dexter finds excesses of occurrences of certain types of behavior to be correlated with meteorological conditions which rarely co-exist. As a normal thing a period of high barometrical pressure is accompanied by low humidity, clear days, and little or no precipitation, while low barometrical pressure is normally associated with high humidity and cloudy, wet days. Therefore, when Dexter finds that the deportment of pupils is best during periods of high barometrical pressure, great

[114] Dexter, op. cit. pp. 247–263.
[115] Ibid. pp. 266–275.

humidity and cloudy, wet days; that assault and battery is more frequent at a time of low barometer, low humidity, and on clear, dry days; that drunkenness is most excessive under high barometrical pressure and high humidity; and that Columbia students showed the quickest discrimination in a period of high barometer, high humidity and cloudy, wet days, his conclusions call for more extended explanation than he offers.

Among American anthropogeographers no one has been more energetic than Ellsworth Huntington. While he has become known chiefly because of his work on climatic influences, his most important scientific contributions have been made as an explorer and observer. His theoretical opinions, however, have been highly influential, particularly in their effect upon English and American writers, and have done much to stimulate interest in the study of environmental influences by social scientists.[116]

Huntington's chief concern is to ascertain, as accurately as possible, the bearing of various climatic, seasonal, and weather conditions upon human efficiency, and he holds that while the psychological effect of such conditions has long been recognized, there has been a tendency to ignore what he considers a very important physiological effect.

A study of the effect of seasonal changes upon five hun-

[116] Huntington's chief works are:—*Explorations in Turkestan*, Publication 26 of the Carnegie Institution of Washington, 1905, pp. 157–317; *The Pulse of Asia*, 1907; *Palestine and Its Transformation*, 1911; *The Climatic Factor as Illustrated by Arid America*, Publication 192 of the Carnegie Institution, 1914; "The Solar Hypothesis of Climatic Changes," *Bulletin of Geographic Society of America*, 1914, pp. 475–590 (pages 526–543 of this are the best summary of his views on climate); "Changes of Climate and History," in *American Historical Review*, January 1913, pp. 231–232; *Civilization and Climate*, 1915; *World Power and Evolution*, 1919, *Climatic Changes: their Nature and Causes*, 1922; and *Earth and Sun*, 1923.

dred and fifty piece-workers in a New England factory revealed the fact that there was an extremely low point in the wage curve in mid-winter and a less pronounced slump in mid-summer, while there was a high point in the wage curve in June and a still greater crest in October.[117] Studies of working men in Pittsburgh and the South, and of students at West Point and Annapolis confirmed the results of the New England study.[118] Tuberculosis patients in the Adirondacks gained most from April to December and their inverted death curve corresponded roughly to the New England wage curve.[119] Light seems to have little effect upon human efficiency except insofar as disturbing conditions associated with darkness come into play.[120] Neither does humidity seem to be especially influential, with the exception of the inside humidity of mid-winter, which is probably chiefly a matter of imperfect ventilation.[121] As for temperature, the maximum of physical efficiency seems to be reached at a temperature of from 59° to 65°. In the Northern Hemisphere the temperature for greatest efficiency does not vary more than 10 degrees for the whole race. Women seem to be affected more by changes of temperature than men. The best temperature for mental work seems to be about 40°, and the best average temperature for both physical and mental efficiency is approximately 50°.[122]

In the matter of the variations in temperature and humidity usually associated with the weather Huntington finds

[117] *Civilization and Climate*, pp. 53 ff., see graphic charts p. 59.
[118] Ibid. pp. 65 ff.
[119] Ibid. pp. 65 ff.
[120] Ibid. pp. 83 ff.
[121] Ibid. pp. 85 ff.
[122] Ibid. p. 103.

that changes of temperature are beneficial, provided they are not too great, a fall in temperature being more beneficial than a rise. Everywhere a fall in temperature of 4° to 7° is generally stimulating. Short gales and light winds are beneficial but long protracted calms or gales are depressing. People appear to work most rapidly at the end of a storm but show a lessened efficiency on the first clear day following.[123] In estimating the relative effect of these different factors Huntington summarizes their importance as follows: succession of clear and cloudy days, one percent; change of temperature from day to day, two percent; maximum effect of humidity, three percent; mean temperature on girls, seven percent; seasons, nine to fifteen percent.[124] He believes that the effects of cyclonic storms, daily changes of temperature and range of temperature from season to season are of about equal importance.[125]

On the basis of the above investigations and generalizations Huntington sets down what he regards as the ideal climate for maximum human efficiency. In general, it should be one with moderate seasonal changes, average humidity and abundant storms. He constructed a map of maximum climatic energy.[126] To test its validity he sent a questionnaire to two hundred and thirteen individuals scattered about over the world requesting their opinion upon the distribution and location of the centers of highest civilization. Replies were received from about one hundred and sixty and the resulting composite map of highest civi-

[123] Ibid. pp. 111–124.
[124] Ibid. p. 124.
[125] Ibid. pp. 131–3.
[126] Ibid. p. 142.

lizations agreed quite closely with the map of climatic energy prepared by Huntington.[127] He also compared his map of climatic energy with the vitality map of the United States, based upon insurance computations, and found that the two agreed substantially.[128] The same coincidence was observed between the map of climatic energy and the educational map of the United States.[129]

In a more recent work, *World Power and Evolution*,[130] Professor Huntington goes even further in his interpretation of social causation in terms of environment, emphasizing particularly the climatic factor. Maintaining that the trend of modern civilization has lessened the adaptation of civilized man to his environment and so diminished the vitality and will power of the race,[131] he sees three main lines of reform which will remedy the situation; namely, better training and education, improved inheritance, and improved national health. Emphasizing the element of health, he contends that its fluctuations are directly correlated with climatic changes.[132]

Considering first the relation of health to business cycles, he concludes that the "prosperity curve follows the health curve with no apparent regard for the crops."[133] This opinion is upheld by the graphs for the United States and

[127] Huntington, op. cit. pp. 148–182. For a criticism of this attempted correlation see the article by A. A. Goldenweiser, "Meteorological Magic," in the *New Review*, May, 1916. Dr. Goldenweiser objects to Huntington's method of sampling and calls attention to the known tendency among men to consider their own civilizations the highest. pp. 164–165.

[128] Huntington, op. cit. pp. 184–185.

[129] Ibid.

[130] Yale University Press, 1919.

[131] Huntington, op. cit. pp. 15 ff.

[132] Ibid. pp. 19–24.

[133] Ibid. pp. 29–42.

Germany, though not by those of France and England whose divergence he attributes to other factors.[134]

Having established the dominating influence of health, Huntington introduces "climate" as the main factor determining health conditions. From graphs of climate and health in Finland, the United States, Germany, Italy, France and Japan, he concludes that "the human race seems to have the best health when the average temperature for day and night together is 64° F., that is, when it varies through the twenty-four hours from 55° to 70°.[135] Not only average temperature, but variability, is important, the most healthful climate having frosty but not cold winters, warm but not hot summers and a constant succession of storms. England, the United States, New Zealand and Germany come nearest to satisfying these conditions.[136]

Huntington applies his theory of the correlation of progress with climatic variability to mutations in the organic world which have produced new species;[137] to the modification of races [138] and to the mental evolution of the race and the salient periods of intellectual vitality such as the Renaissance.[139] The periods of Roman expansion he correlates with eras of stimulating climate, while the periods of decline were accompanied by depressing climatic conditions. Turkish decline he attributes to unfavorable weather conditions aggravated by economic distress and intensified by racial intermixtures.[140] And finally, Ger-

[134] Ibid. pp. 51–57.
[135] Ibid. p. 71.
[136] Ibid. p. 98.
[137] Ibid. p. 162, chap. ix.
[138] Ibid. pp. 183–184; chap. x.
[139] Ibid. p. 147; chap. viii.
[140] Ibid. p. 223.

many's remarkable power in the Great War is due to the fact that "no other nation in the world has so many people who live under highly stimulating climate." [141] He fails to explain why the Germans remained politically and economically backward through nearly two thousand years of similar climate.[142]

To one who is not convinced of the primary importance of climate in social evolution the book seems rather exaggerated, for although Huntington appears comprehensive and well-balanced in that he enumerates the other factors involved in cultural problems, he fails to evaluate them and formulates his generalizations as if climate were the only important factor present.

A very satisfactory summary of the relation of climate to mankind and social institutions is presented by Robert DeCourcy Ward in his work, *Climate, Considered Especially in its Relation to Man.*[143] It is based upon the best scholarship of the present day, is exceedingly moderate in its claims and is wholly lacking in that dogmatism which characterizes so many writers on the subject. Much of it, however, deals with indirect climatic influences such as the effect of bountiful environments and seasonal changes upon provident traits in man. These and his rather pronounced opinions regarding climatic changes are discussed in later chapters.[144]

Although Ward devotes his attention almost wholly to the

[141] Huntington, op. cit. p. 238.

[142] His main conclusions are summarized on pages 239 to 244. See reviews of this book by F. H. Hankins in the *Journal of Race Development* for 1919, and by A. A. Goldenweiser in the *Political Science Quarterly* for 1920.

[143] 1902.

[144] See below, chaps. vi and ix.

subject of climatic influences he does not claim for climate a supreme position even among environmental influences. He makes it clear that there are many other factors in the physical environment which control mankind and that social institutions exert their influence in addition to the effects of the influences of the physical universe:—

> Man moves readily from place to place, from climate to climate. His food, drink, habits, and occupations; to some extent his physical and mental characteristics, change in consequence. Inheritance, intermarriage, environment, opportunities, soil, and many other factors enter in to determine what changes individual man and the race as a whole shall undergo. Time is a very important element in the final result, for in time a gradual adaptation to new conditions takes place. Climate is but one of many controls, albeit a most important one, for it largely determines what many of the other factors, such as diet, customs, and occupations, for example, shall be. The task of giving climate its proper place as a factor controlling the life of man as a whole is a difficult one, which cannot be definitely and satisfactorily solved to-day, or to-morrow.[145]

Although he speaks of the "deadening effect of continued heat," and denies the suitability of a tropical climate for progressive intellectual development, Ward contends that the physiological effects of life in the tropics are not as yet fully and scientifically determined.[146] In general, however, the monotonous heat is depressing. At the opposite extreme in general character, but similar in its discouragement of cultural development is the cold climate of the polar regions. Much of man's time and energy there is spent in defending himself against the extreme cold. The

[145] Ibid. p. 223.
[146] Ibid. pp. 273–4.

adversity of the polar environment leaves him no surplus energy with which to evolve a higher civilization.[147] Between these extremes of tropical heat and polar cold lies the temperate zone with its stimulating atmosphere. "Intermediate in location, in mean temperature, and in their physiological effects, the temperate zones, whatever was the condition in the past, are to-day clearly the center of the world's civilization, as they have also been the scenes of the most important historical developments for several centuries. From the temperate zones have come the explorers and adventurers of the past, and are coming the exploiters and colonisers of to-day. The monotonous heat of the tropics and the continued cold of the polar zones are both depressing. Their tendency is to operate against man's highest development. The seasonal changes of the temperate zones stimulate man to activity. They develop him physically and mentally. They encourage higher civilization." [148] Finally, with characteristic moderation, Ward notes that only the broadest generalizations can be made concerning conditions in the temperate zone; there are here so many variations that the general region must be split up into typical districts in order to make possible any intelligent and scientific study.[149]

[147] Ward, op. cit. p. 324.

[148] Ibid. pp. 272–274.

[149] A suggestive but unconvincing study of meteorological influences is found in *The Effects of Tropical Light on White Men*, N. Y. 1905, and the *Expansion of Races*, 1909, by Chas. E. Woodruff, an American army surgeon and ethnologist. Woodruff deals with the doctrine of "Actinism," by which he means that "The skin of man was evolved for the purpose of excluding the dangerous actinic or short rays of light which destroy living protoplasm." In the process of adaptation to environment pigmentation has developed in proportion to the strength of the light, the black races at the equator shading to the blonde in the north. The earliest type of man was a brunette, originating in central Europe and Asia, but the achievement of the highest civili-

A good short summary of the relation of environment to man and society is contained in Professor J. Russell Smith's *Industrial and Commercial Geography.*[150] His views are not unlike those of Robert DeC. Ward, particularly with regard to the stimulating influence of a temperate climate and the enervating effect of tropical heat. "Cold," he says, "is a great stimulus to activity," and, "this is as true of nations as of persons." He therefore considers it fortunate that modern transportation has made possible a great migration into the colder regions of the north, for "the human race is thus being much more exposed to frost than formerly."[151]

> The great cities of the world's so-called Great Powers are surprisingly close to the middle latitude between the extremes of heat and cold. The cities that make the policy of world politics are New York, Boston, Philadelphia, Washington, Chicago, London, Liverpool, Edinburgh, Paris, Berlin, Hamburg, Leipzig, Vienna, Rome, Milan, St. Petersburg, Moscow, Pekin and Tokyo. Every one of them has snow in winter and a hot summer. They all lie in the middle third of latitude, none being above 60° or below 30° N. North of this line of centers of world leadership, the population and power decline because there is too much frost to allow production, and south of it power and national energy decline because there is too much heat to permit activity, although the tropics teem with unmatched possibilities.[152]

zation was reserved for the blondes, who, lacking protection against strong light, can live and propagate only in the northern cloudy climates. Applying this doctrine to pathology, he attempts to trace nervous diseases through physical deterioration to a lack of adaptation to light and climatic conditions. Upon this theory of light and acclimatization he bases a theory of history and discovers the causes underlying all modern social problems. See also his *Medical Ethnology.*

150 New York, 1913.

151 Op. cit. pp. 5–10.

152 Ibid. p. 10.

Economic Cycles: Their Law and Cause [153] by Professor Henry L. Moore is a conspicuously original contribution to environmental theory and a cleverly conceived application of the statistical method to establish a causal relationship between meteorological conditions and the economic life of man. "The most general and characteristic phenomenon of changing society," says Professor Moore, "is the ebb and flow of economic life, the alternation of energetic, buoyant activity with a spiritless, depressed and uncertain drifting," and the avowed object of his study is to discover the causal explanation of these alternating periods of activity and depression.[154]

In seeking this causal explanation, Professor Moore relates economic cycles to variations in the yield of certain agricultural products, which he shows, in turn, are dependent upon variations in rainfall.[155] After a detailed study of the records of rainfall in the Ohio valley, covering a period of seventy-two years, and in Illinois, our leading grain producing state, for a period of forty years, he discovers that rainfall in these localities passes through two cycles, one of about thirty-three years in length, and another shorter period lasting about eight years.[156] He next shows that there is a high correlation between these cycles of rainfall and variations in the yield per acre of the selected agricultural products in the same localities.[157] Finally, he shows that these cycles in the yield of crops con-

[153] New York, 1914.
[154] Op. cit. p. 1.
[155] Ibid. pp. 2–3.
[156] Ibid. pp. 4–34.
[157] Ibid. pp. 35–57.

stitute the fundamental cause of economic cycles.[158] His general conclusion he sums up thus:

In the Introduction to this Essay it was observed that economic dynamics stands in need of a law that shall be to a changing society what the law of diminishing returns is to a society in a relatively static state. We may now formulate the law: The weather conditions represented by the rainfall in the central part of the United States, and probably in other continental areas, pass through cycles of approximately thirty-three years and eight years in duration, causing like cycles in the yield per acre of the crops; these cycles of crops constitute the natural, material current which drags upon its surface the lagging, rhythmically changing values and prices with which the economist is more immediately concerned.[159]

[158] Ibid. pp. 93–157.

[159] Ibid. p. 149. See also *Generating Economics Cycles*, New York, 1923, by the same author. In this later work Professor Moore develops the hypothesis of an extra-terrestrial explanation of climatic cycles.

Says Jevons, discussing the relation of sun-spots to the price of grain: "It is curious to reflect that if these speculations should prove to have any validity, we get back to something which might be mistaken for the astrology of the middle ages." Op. cit. p. 185.

CHAPTER VI

THE INFLUENCE OF NATURAL RESOURCES

WITH the single exception of climate no geographic factor in social development has received so much attention from writers ancient and modern as natural resources. Earlier theories are simple: a fertile soil effeminates a people and barrenness makes them brave; or the character of the food consumed has a direct effect upon the character of the population. Later theories are more involved and deal with less direct effects, e. g., a rich or a poor environment affects man and society indirectly by limiting the size of the population and thus determining its composition and general character. In fact, with the evolution of environmental doctrines less and less attention is given to the simple, direct effects of natural resources and more and more to those which are indirect.

Among ancient writers, Hippocrates held that the greater vigor and fierceness of Europeans, as compared to Asiatic peoples, is attributable in part to the fact that in Asia the food supply is bountiful and easily secured, and hence there is no natural stimulus for developing foresight, ambition, alertness and bravery.[1] Herodotus expressed the same idea, and while it is represented as the opinion of Cyrus, it is likely that Herodotus was following the custom of putting his own ideas into the mouths of oriental sages and po-

[1] Hippocrates, loc. cit.

tentates.[2] When some of his leaders urged Cyrus to leave the barren regions of the land surrounding his capital and occupy the fertile regions which had been conquered, Cyrus refused and warned them "not to expect in that case to continue rulers, but to prepare for being ruled by others." "Soft countries," he said, "give birth to soft men," adding that "there is no region which produced very delightful fruits, and at the same time men of a warlike spirit." As a result, the leaders were satisfied "rather to dwell in a churlish land and exercise lordship than to cultivate plains and be the slaves of others."[3]

According to Thucydides great fertility of soil is not likely to have a favorable effect upon the character of a people. Highly productive land makes for an unequal distribution of wealth, and the superior economic status of the few brings on opposition from the many and leads to internal dissension. Moreover, highly productive soil attracts robbers from other regions, who often come and despoil the inhabitants of their possessions. For much the same reason that a burglar rarely breaks into a poor man's house, Attica with her unfertile soil did not suffer from covetous neighbors, and was therefore able to rise to greater power than any other Grecian state.[4]

Strabo was the greatest geographer of antiquity, and his masterful attempts to prove a necessary relationship between geography and history entitle him to first place also among environmentalists of that period.[5] While his en-

[2] Cf. Bury, *The Ancient Greek Historians*, Lecture II—Herodotus.

[3] *History* of Herodotus, trans. by George Rawlinson, 4 vols. 1859–60, Bk. IX, sec. 122. Cf. Meuten, op. cit. pp. 14–15.

[4] Jowett, *Thucydides*, Bk. I, sec. 2.

[5] Cf. H. F. Tozer, *A History of Ancient Geography*, p. 246.

vironmental theory is many sided and his interpretations broad, special emphasis is laid upon the effect of fertility of the soil. Fertility, according to Strabo, tends as a rule to make populations not only prosperous but peaceful.[6] A favoring soil, however, is not an unmixed blessing because prosperity inclines people to luxury, destroying their ruggedness and weakening their moral fibre.[7] As will be seen later this idea of the relationship between the fertility of the soil and the moral fibre of human beings is frequently encountered in subsequent writers, among them being Montesquieu, Ferguson, Treitschke, Guyot and Robert DeC. Ward.

Strabo believed also that a rich and fertile region, especially when occupied by a peace-loving population, is a constant attraction to covetous neighbors who live in less fruitful environments and leads to endless robbery and invasion.[8] Barren regions, on the other hand, tend to develop robbers and fighting men, for, finding little in their own environment to reward industrious effort, they are compelled to resort to preying upon their neighbors for a livelihood:—

[6] Strabo, *Geography*, Bk. II, chap. v, sec. 26, trans. by Hamilton and Falconer.

[7] The fertility of their country has been productive to the Campanians of as much evil as good. Their luxury ran to such a height, that they would invite to supper, in order to exhibit pairs of fighting gladiators, the exact number of pairs being regulated according to the distinction of the guests. When, on their voluntary submission to Hannibal, they received his soldiers into winter quarters, the pleasures of the place rendered the men so effeminate, that Hannibal said, although conqueror, that he was in danger of the enemy, since his soldiers were returned to him women, and no longer men. Strabo, op. cit. Bk. V, chap. iv, sec. 13.

[8] Strabo, op. cit. Bk. III, chap. v. sec. 1, and Bk. XII, chap. viii, sec. 6. Cf. A. R. Cowan, *Master Clues in World History*.

The Cossæi, like the neighboring mountaineers, are for the most part archers, and are always out on foraging parties. For as they occupy a country of small extent, and barren, they are compelled by necessity to live at the expense of others. They are also necessarily powerful, for they are all fighting men. When the Elymæi were at war with the Babylonians and Susians, they supplied the Elymæi with thirteen thousand auxiliaries.

The Parætaceni attend to the cultivation of the ground more than the Cossæi, but even these people do not abstain from robbery.

The Elymæi occupy a country larger in extent, and more varied, than that of the Parætaceni. The fertile part of it is inhabited by husbandmen. The mountainous tract is a nursery for soldiers, the greatest part of whom are archers. As it is of considerable extent, it can furnish a great military force; their king, who possesses great power, refuses to be subject, like others, to the king of Parthia.[9]

The theory that the character of the food consumed has a direct effect upon human traits is as old as Plato, who held that food "not only affects the bodies of men for good or evil but produces similar results in their souls."[10] Aquinas, in advising a ruler about to found a city, urges that special attention be paid to the food supply available, and likewise to the water supply. The best way to find out about the food is to examine the animal life in the locality. The state of health among the animals will be a criterion of man's chances for health, for both live on the products of the earth. If there are human beings living in the locality they too should be examined as to their physical characteristics and health and it should be ascertained whether they

[9] Strabo, op. cit. Bk. XVI, chap. i, sec. 18.
[10] *Laws*, Bk. V, sec. 747, p. 130, trans. by Jowett, 3rd ed, 1892.

have any old men living among them. These facts will furnish additional basis for judging the suitability of the location.[11]

Khaldun goes further than Aquinas. Discussing the effect of bountiful and sparse habitats on a population he holds that people who dwell in very bountiful habitats where food is plentiful and easily obtained have "la reputation d'avoir l'esprit lourd et le corpe grossierement forme," and he gives the rather crude physiological explanation of this condition as "L'effet des vapeurs pernicieuses qu'elles envoient au cerveau; de la resultent l'engourdissement de l'esprit, la nonchalance et un grave ecart de l'état normal."[12] Finally, he asserts that there can be no specific law laid down regarding the amount of food which is best adapted to produce the most efficient people. The whole drift of his argument apparently is to prove that the Arabs, who live on a sparse diet, are superior to the heavy eaters among the agricultural peoples.[13]

Buffon also makes allowance for the influence of food and asserts that it directly affects the internal structure of the body. Different environments with their varied kinds of food will, thus, naturally cause varied types of human beings to develop. Seeking an explanation for differences in physical characteristics between peoples who occupy the same general environment he reaches the following conclusion:

[11] Aquinas, loc. cit.

[12] Khaldun, op. cit. pp. 177–9.

[13] A good brief analysis of the environmental doctrines of Ibn Khaldun is found in Robert Flint's *History of the Philosophy of History*, 1894, pp. 158–172.

The most general and direct cause, therefore, is the quality of the food; for it is principally by the aliments that man receives the influence of the land which he inhabits, the air and the atmosphere acting more superficially; and while the latter alters the external surface by changing the form of the skin; the food acts on the internal form by its properties, which are constantly relative to those of the earth which produces it.[14]

Beginning with Montesquieu environmentalists have, on the whole, stressed the indirect rather than the direct effects of geographic factors. Montesquieu considered fertility of the soil conducive to monarchy, because in fertile countries the chief interest of the people lies in agricultural and commercial pursuits and they are indifferent to their form of government if they are permitted to live in peace and carry on their occupations.[15] Moreover, fertile countries are usually flat without any natural protective barriers, which makes them an easy prey to foreign powers, for a fertile country invites invasion and is conducive to ease and effeminacy. Barrenness, on the other hand, stimulates industry.[16]

The Physiocrats interpreted social evolution in terms of agriculture. With agriculture, they held, came settled life, property, political government, and a great increase of population—the last named being occasioned by an increase of wealth. The Physiocratic conception of production was the creation of a surplus over cost rather than mere creation of commodities, and it is this surplus which makes possible commerce, the professions, and industrial progress.

[14] Buffon, op. cit. Vol. IV, p. 15.
[15] Op. cit. Bk. XVIII, chap. i.
[16] Ibid. chaps. iii-iv.

It is due to the bounty of nature and was termed the "produit net," and upon its amount depended the prosperity of a country and the rate of social evolution. This is the great and fundamental contribution of the Physiocrats to social philosophy. It is this which justifies their inclusion as members of a school of sociology which interprets society in terms of physical processes.[17]

According to Rousseau, localities which are unfruitful and barren should remain uncultivated and should be occupied by savages, if occupied at all. Localities where only the bare necessities of life can be produced should be occupied by barbarous peoples. Countries where the surplus is moderate are best adapted to democracies. Countries in which there is a great surplus over the labor expended should be governed by a monarch, since it is better that the excess be squandered by the government than by private persons.[18] This surplus of production over the expense of labor is not entirely due to the effect of climate, but depends also upon the ease with which the land can be tilled. In other words, the greater the exertion to produce a given amount, the smaller the surplus. In this theory of the surplus of production over expense in agriculture, Rousseau follows the Physiocrats.

Adam Ferguson, expressing an idea quite common among writers from Hippocrates to Huntington, considered that regions of too great plenty on the one hand, or of great scarcity on the other, are not well adapted to the development of progressive societies. What is needed, he

[17] Ingram, *A History of Political Economy*, p. 62. Giddings, *Principles of Sociology*, p. 10.

[18] Rousseau, *Social Contract*, trans. by Tozer, Bk. III, chap. viii.

says, is enough opposition from the environment to stimulate industry, but not so much as to discourage initiative and effort, for "insuperable difficulties to be overcome, or strong inducements to indolence and sloth, equally prevent the first applications of ingenuity, or limit their progress. Some intermediate degrees of inconvenience in the situation, at once excite the spirit, and, with hopes of success, encourage its efforts." [19]

The German historian, Heeren, grasped the significance of economic facts in the history of peoples and set them forth in a systematic manner in his *Historical Researches Into the Politics, Intercourse, and Trade of the Principal Nations of Antiquity.*[20] The industrial and commercial activity of a people, and often their political development is, according to Heeren, related to their geographic setting. Therefore, his history of each of the nations considered begins with a careful description of its physical environment. It is only in comparatively recent times that suggestions such as his have been made the basis of the newer science of history which puts economic and geographic factors in the front rank of importance for historians.

Karl Ritter, who has probably never been excelled as a compiler and organizer of geographic data, held that "the historical course of every country is read in its natural conditions, and from the primitive endowment of a continent its capacity for historical development is legible at a glance." [21] Man is a part of nature, and as such he cannot avoid being affected by geographic influences. "He be-

[19] Ferguson, op. cit. p. 181.

[20] English translation by Talboy, 3 Vols. Oxford, 1846.

[21] *Ritter's Geographical Studies*, edited by Wm. L. Gage, Boston, 1861, p. 307.

longs to the earth," says Ritter, "and to the three natural kingdoms, the mineral, the vegetable and the animal, and the animal having, by virtue of his material form, characteristics found in all of these." Therefore it follows that the products of a region wield a powerful influence over the occupations and characteristics of a people.[22]

> The diffusion of the gifts of nature over the whole surface of the earth exercises now, and always has exercised in the past, a powerful influence upon the characteristics of the inhabitants of different districts. The very productions of the soil have been interwoven, as it were, into the texture of the human mind. . . . We cannot glance for a moment at the characteristics of agricultural, hunting, fishing, and of shepherd people, without seeing how their occupation stamps the whole of their feelings and thoughts, directs their simple philosophy of life, and gives tone even to their religious ideas.[23]

Oscar Peschel's most significant contributions to the subject of this chapter are found in his summary of the relation between environment and the origin and growth of civilizations, and of natural resources and commerce to the distribution of peoples. He held that the presence of important products of commerce—animal, vegetable or mineral—has had a great influence upon the location and development of different nations. It has caused the massing of populations in certain places, has brought higher civilizations in contact with lower, and has brought all nations into the current of civilization.[24] This idea he summarizes in the following words:—

[22] Gage, op. cit. pp. 247–248.
[23] Ibid. p. 283.
[24] Oscar Peschel, *The Races of Man*, pp. 209 ff.

We thus see how much we owe to the rare and precious products of the animal, vegetable, and mineral kingdoms, as the means by which human culture was spread, and as the baits which attracted national migrations, and we perceive that the regions which were fortunate enough to possess such treasures were the first to be drawn into the sphere of a higher culture: the direction in which civilization has moved has frequently been prescribed by this influence.[25]

As examples of natural resources, the presence of which has determined the distributions of nations and culture, Peschel mentions the following: horn, shells, and obsidian in prehistoric times; tin in early Britain and amber in the Baltic region; gold and silver in the New World; tobacco in Virginia; furs in Canada; gold in Australia; and spices and teas in the East Indies.[26]

Treitschke expresses the view that similar geographic conditions have different effects at different periods in history. Before the Industrial Revolution, the hilly northwest of England was the seat of all reaction and backwardness, but since that time it has been transformed into a section of industry and radicalism because of the discovery of coal and iron in the district.[27] The introduction of a new type of domesticated animals into a community may also transform the culture, as for example, the introduction of horses into the new world.[28] He believes also that fertile soils, as well as mild climates, make people "soft and lazy," as pointed out in the preceding chapter—a

[25] Ibid. p. 218.
[26] Ibid. pp. 209–217.
[27] Treitschke, op. cit. pp. 207–8.
[28] Op. cit. p. 209.

theory expressed by many writers both ancient and modern.[29]

As pointed out in the preceding chapter, Buckle classifies under four heads the physical agents which exert the most powerful influence upon the human race—climate, food, soil, and the general aspects of nature.[30] The first three of these influences are studied together, as each of them is in such a marked degree dependent upon the others.[31] He does not go as far as certain present day ethnologists who insist that these agents account for racial differences, but he holds that a satisfactory explanation of the effect they do have will be a powerful aid to a proper understanding of history.[32]

Climate, soil, and food, says Buckle, influence mankind first of all because they make for the accumulation of wealth, and the accumulation of wealth must precede any high development of knowledge.[33] This is because there can be no leisure without wealth, and no knowledge without leisure, for it is the surplus resulting from an excess of production over consumption that makes existence possible for those who do not create the wealth upon which they live, namely the intellectual classes. Therefore, although knowledge, when it comes, aids in the production of wealth, the accumulated wealth, broadly speaking, must come first.[34]

In the early stages of the accumulation of wealth, the

[29] Treitschke, op. cit. pp. 209–210.
[30] Buckle, op. cit. p. 29.
[31] Ibid. p. 30 f.
[32] Ibid. pp. 29–30.
[33] Ibid. p. 31.
[34] Ibid. pp. 30–31.

energy and regularity of labor, as has been pointed out, depend upon the climate. The returns to labor depend upon the fertility of the soil. "These," says Buckle, "are the great physical causes by which the creation of wealth is governed. There are, no doubt, other circumstances which operate with considerable force, and which in a more advanced state of society possess equal and sometimes a superior influence. But this is at a later period; and looking at the history of wealth in its earlier stage, it will be found to depend entirely upon soil and climate." [35]

To show the marked influence of a bountiful habitat upon social processes Buckle calls attention to the wandering Tartars who came from the barren steppes of northern Asia to the fertile soils of China, India, and Persia, and have developed large and prosperous empires and great civilizations.[36] He points also to the Arabs who conquered the bountiful countries of Spain and Persia and developed the great Saracen civilizations at Cordova and Bagdad.[37] He holds also that the relative influence of climate and soil differs in various countries and continents; in Asia it is apparently the fertility of the soil which has had the greatest influence, while in Europe it appears that the greatest importance should be assigned to climate.[38] This accounts for the superiority of European civilizations over those of Asia as regards both achievements and permanence. He reaches this inference through the following line of reasoning. In Asia, where fertility was the chief influence, it was a case of the simple relation of the

[35] Ibid. p. 33.
[36] Ibid. pp. 33–34.
[37] Ibid. pp. 34–36.
[38] Ibid. pp. 36–37

soil and its produce—the mere operation of one part of external nature upon another. In Europe, where the chief factor was the climate, the important relation was the reaction of external nature not upon itself but upon man. Since the reactions of nature upon nature are less complicated and less subject to disturbances than the reactions of nature and man they come into play sooner—hence the priority of Asiatic to European civilization. On the other hand, this interaction of soil and its produce has no great effect upon man himself. The powers of nature are limited and relatively unchanging; consequently civilizations springing from the soil and dependent upon the bounty of nature never reach the heights attained by those depending upon climate for their development. The only effective progress is based upon the energy of man, and the powers of man are not limited like those of nature.[39]

After the accumulation of wealth comes the distribution of wealth. This, Buckle believes, can also be shown to depend upon physical causes in primitive times, and even in more recent times where the society is not far advanced.[40] As soon as the accumulation of wealth has fairly begun, the population begins to divide into two classes, the employers and the employed. The price paid for labor, like anything else offered in the market, will depend upon the action of the law of supply and demand; if laborers are more plentiful than the demand for them wages are bound to be low and vice versa.[41] The question of food is the most important influence affecting the growth of popula-

[39] Buckle, op. cit. p. 37.
[40] Ibid. p. 38.
[41] Ibid. pp. 39–40.

tion. Consequently, where food is most abundant and least needed, the increase in population will be greater than where food is scarce and difficult to secure, and where a great amount is needed to preserve life. Next, it is obvious that in warm and fertile countries food is more abundant than in cold and barren countries, that less is needed, and finally, being mainly vegetable rather than animal food, it is more easily secured. It is, therefore, apparent that there is a greater tendency toward an increase of population in warm countries than in cold. This brings us to the final conclusion that "there is a strong and constant tendency in hot countries for wages to be low, and in cold countries for them to be high." [42]

After reaching this important conclusion regarding the influence of food upon the distribution of wealth, Buckle proceeds to test his theory by examining conditions in Ireland, India, Egypt, Central America and Peru. He assumes the burden of proving (1) that where a cheap national food is present the population tends to increase very rapidly; (2) that this increase of population decreases wages and the average wealth of the laborers; (3) that this poverty of the masses tends to make more apparent the division between rich and poor—for wealth gives power and poverty invokes contempt; (4) that the result is absolute subjection of the lower classes, and the most abject misery among them.[43]

In Ireland, the potato, introduced in the sixteenth century, furnished a very cheap national food. Consequently, there was a rapid increase of population down

[42] Ibid. pp. 42–47.
[43] Ibid. pp. 49–50.

to the time of the great famine caused by the blight, with low wages, and a great body of peasants.[44] In India, where rice was the chief food, the population grew rapidly, the caste system appeared, and the laboring classes were held in contempt.[45] In Egypt he found a similar situation. There the date is the chief food, and the population is very dense, the great peasant masses being the same physically and socially as they were at the dawn of history.[46] Finally, he turns to Mexico and Peru, the seats of the great early civilizations in America, and again finds the same conditions. Maize and potatoes furnished the food in Peru; maize and bananas in Mexico. The result was the same—dense populations, low wages, and oppression of the poorer classes.[47] The general conclusion he draws from these facts is summed up in the following paragraph:—

The preceding evidence, collected from sources of unquestioned credibility, proves the force of those great physical laws, which in the most flourishing countries out of Europe, encouraged the accumulation of wealth, but prevented its dispersion; and thus secured the upper classes a monopoly of one of the most important elements of social and political power. The result was, that in all those civilizations the great body of the people derived no benefit from the national improvements; hence the basis of progress, being very narrow, the progress itself was very insecure. When, therefore, unfavorable circumstances arose from without, it was but natural that the whole system should fall to the ground. In such countries, society, being divided against itself, was unable to stand. And there can be no doubt that long before the crisis of

[44] Buckle, op. cit. pp. 47–49.
[45] Ibid. pp. 50–58.
[46] Ibid. pp. 59–67.
[47] Ibid. pp. 67–84.

their actual destruction, these one-sided and irregular civilizations had begun to decay; so that their own degeneracy aided the progress of foreign invaders, and secured the over-throw of those ancient kingdoms, which, under a sounder system, might easily have been saved.[48]

Though some exceptions may be taken to Buckle's treatment of the influence of climate, soil, and food, very little effective criticism, on the whole, can be directed against his general conclusions. He does not show as fully as might be desired how climate tends to promote progress, for he fails to show that temperate climates, with alternating seasons of want and plenty, develop provident traits in human nature, the ability to forego present pleasure for future well-being, a quality essential to all progress. Still he hints at the converse when he says that the bountiful habitats of the warmer countries do not develop the energy of the individual. In the main, however, he seems to adhere to Montesquieu's notion of the direct effect of climate on bodily vigor, which, while doubtless true as far as it goes, is an incomplete explanation of the benefits of a temperate climate.

There is little that is new, however, in Buckle's physical interpretation of society. Most of his views, including the theory that environmental influences determine the development of lower civilizations and are most effective in the early stages of social evolution, are to be found in the works of earlier writers, and his work is largely an elaboration of those earlier doctrines. Buckle's contribution was his systematic examination of these influences. Having a

[48] Ibid. pp. 84–85.

wider knowledge of history, and a greater amount of data at his command, he was able to treat the subject in a more comprehensive manner than many who preceded him.

Spencer does not accept at its face value the theory that highly fertile regions are unfavorable to social progress, and he cites a number of instances to show that substantial progress has been made in regions of great fertility, as for example in the Sandwich Islands, in Tahiti, and in the most progressive parts of Central Africa. In fact, he is certain that a highly productive habitat, as well as a tropical climate, is necessary for the beginnings of civilization and for the same reason—because the earlier and feebler stages of social evolution demand a setting where the environment offers a minimum of resistance. With advancement in knowledge and organization more difficult habitats can be mastered, but this cannot be done in the beginning.[49] Variety of soil is also favorable to social progress because it furnishes a variety of products and therefore a variety of opportunities for industrial development.[50] The flora, likewise, may aid or hinder civilization. Where it is so scanty as to prevent any considerable growth of population there can be no high civilization, and where forests and useful plants are absent there can be little or no progress.[51] Generally speaking, the converse is true, that is, an abundance and variety of flora are conducive to a rapid increase of population and the development of the arts of civilization. An excess of vegetation, however, may obstruct progress, as for example, among primitive peoples

[49] Spencer, *Principles of Sociology*, Vol. I, p. 28.
[50] Ibid. pp. 28–29.
[51] Ibid. p. 29.

living in jungles and lacking the tools to clear them away.[52]

The fauna of a region, says Spencer, also bears an important relation to the culture of the people. An abundance of wild game is likely to prolong the hunting stage; the presence of animals that may be domesticated tends to invite and prolong the pastoral stage.[53] If there is a scarcity of wild animals or of animals that may be domesticated, agriculture is likely to be hastened, bringing with it an advancement in civilization.[54] Harmful fauna, such as large carnivorous animals, poisonous reptiles and various insect pests, may hinder social progress, particularly among primitive peoples who cannot protect themselves against such dangers and pests.[55] The fauna, therefore, is a potent influence for social progress or retardation, and among primitive peoples especially it has an important effect upon the industries of the region.

Ratzel viewed the relation between man and his environment, not as a struggle between two conflicting forces, but rather as a process in which man develops himself as a part of the earth's surface. As he himself states it, "Man belongs to earth as a portion of the earth."[56] But though man is really a part of the collective life of the earth his progress comes chiefly through dominating and adapting to his use the other forms of organic life.[57]

Nations and human society as a whole, according to Ratzel, are organizations reacting to nature like an animal

[52] Ibid. pp. 29–31.
[53] Ibid. pp. 31–32.
[54] Ibid. p. 31.
[55] Ibid. pp. 32–33.
[56] Ratzel, loc. cit. p. 61.
[57] Ibid. pp. 64–65.

organism to its physical environment. He holds that anthropogeography is merely a branch of biogeography and that the state is a real organism and not merely an analogy. While it is an actual organism, yet the state is the highest of all organic forms of life because individual members have a greater independence and this independence increases as the organism develops; because the moral and spiritual unity supply the lack of material or physical contiguity and continuity; and because the cells of the state do not decay, but mix with new ones formed by invading peoples, thus bringing it to pass that nations are never destroyed but are rather transformed.[58] In spite of the fact that the spiritual unity in the social organism is extremely important, there is a very vital material unity furnished by the soil—"the connection with the ground." This he sums up in the following manner:—

> The ground furnishes the only material tie that binds individuals together into a state; and it is primarily for this reason that all history exhibits a strong and ever increasing tendency to associate the state with the soil—to root it to the ground, as it were. The earth is not only the connecting principle, but is also the single tangible and indestructible proof of the unity of the state.[59]

This organic nature of society tends to make historical development similar in similar climates and physical surroundings. "Lands, no matter how distant from one another they may be, whenever their climates are similar, are destined to be scenes of analogous historical developments. . . . Man, in spite of all racial and national dif-

[58] Ratzel, loc. cit. pp. 65–67.
[59] Ibid. p. 66.

ferences, is fundamentally quite as much of a unity as the soil upon which he dwells." [60]

Ratzel next considers what he calls "the historical movement of peoples," a process which may be viewed in another sense as the "struggle for area." This is, perhaps, the greatest factor in social evolution and corresponds in a general way to the struggle for existence in biological evolution.[61] The movements of peoples are the resultant of "the internal motive forces which are peculiar to life, and of the influences of the ground to which the life is attached." To these must be added, in the case of human movements, the "spiritual impulses of the intellect and will of man." Normally, the movement of nations or the struggle for area is dependent upon and directly in proportion to the rate of internal growth and power. To grasp the full significance of the movement of peoples one must look beyond the great historic migrations and note the ceaseless moving of all peoples in all times. There is no basis in fact for the popular view that all the movements of peoples are from east to west, as though directed by some mystical power. The only general law is that the movement is toward the weaker or richer neighbor, namely along the line of least resistance or of greatest attraction. The movement of peoples has usually been motivated by the desire to acquire land and its advantages, and land has ever tended to become more valuable with the growth of population and the improvement of the industrial arts. These movements may take place by conquest or by colonization preceded by economic penetration. The latter

[60] Ibid. p. 64.
[61] Ibid. p. 67.

is the more advanced type and the one which seems most likely to prevail in the future. In this process migration produces divergencies from the original national type and thus aids the process of differentiation which Ratzel regards as "the leading factor in organic growth." Nevertheless, this differentiation is moderated and kept in control by the fact that even migrating branches of nations "hold fast to their natural conditions of existence." [62]

Miss Semple asserts that the products of an environment as well as the facilities for industry and commerce, have a profound effect upon the economic and social development of a people. Where these products are abundant and easily obtained, the country may acquire wealth and power, particularly if industry and commerce are possible. On the other hand, an environment in which the products are scanty and difficult to secure is likely to be condemned "to the dwarfing effects of national poverty." [63] Food wields a powerful control over the affairs of men. It affects their manner of life, the size of their groups, their place of residence, and the length of their stay in any one place. As man advanced from the hunting stage to the pastoral and thence to agriculture, radical changes took place in the methods of securing and storing food supplies, thereby decreasing the amount of land necessary for the support of the individual—a condition which goes hand in hand with civilization.[64] Progress may be retarded, on the other hand, by poor methods of cultivation and a lack of domestic animals, as well as by poor soil and an un-

[62] Ratzel, loc. cit. pp. 67–72.
[63] Semple, *Influences of Geographic Environment*, p. 43.
[64] Ibid. pp. 61–62, 64–65.

favorable climate.[65] Such an environment often forces artificial checks to population, like polyandry, infanticide and cannibalism, while the increasing population in the richer and better cultivated region necessitates and brings about a more highly organized government.[66]

Progress, however, not only gives man greater mastery over nature—it makes him, in many instances, more and more dependent upon nature. The mechanical inventions in England, for example, have given the people a mastery over their environment greater than ever before, but at the same time England is more dependent upon an outside food supply than ever before. Mechanical and scientific improvements can operate only on the materials provided by nature.[67] Thus, says Miss Semple, the natural resources of an environment are important because they determine in large measure the size, structure, culture, wealth, and political prestige of the social group.[68]

The terms state or nation, in Miss Semple's usage, include two prime factors, people and land—"the first unthinkable without the other." A land is fully understood only by studying the history of its people, and an intelligent understanding of the people is possible only when considered together with their physical surroundings. It is only through the medium of geography that one can comprehend many of the processes and events in the political life of a nation.[69] In like manner, though in less degree, land or environment is a factor in the history of society as

[65] Ibid. pp. 62–63.
[66] Ibid. pp. 65–67.
[67] Ibid. pp. 70–71.
[68] Ibid. p. 43.
[69] Ibid. p. 51.

distinguished from the state, and even kinship society cannot be understood apart from the land.[70] Its general type, organization and predominant industries are in large degree conditioned by the character and quantity of its natural resources.

Discussing tropical regions, Guyot says "a nature too rich, too prodigal of her gifts, does not compel man to snatch from her his daily bread by daily toil." In the frigid zones, man has indeed to struggle for his existence, but it is a desperate struggle and a losing one, because it is impossible for him to accumulate that surplus upon which all progress depends. In the temperate zones, with their alternating seasons of plenty and scarcity, man is compelled to struggle, but his efforts find a rich reward, and the temperate regions are thus "the most perfectly organized for the development of man."[71]

A more economical nature yields nothing except to the sweat of his brow; every gift on her part is a recompense for effort on his. Less mighty, less gigantesque, even while challenging man to the conflict, she leaves him the hope of victory; and if she does not show herself prodigal, she grants to his active and intelligent labor more than his necessities require; she allows him ease and leisure, which give him scope to cultivate all the lofty faculties of his higher nature. Here, physical nature is not a tyrant, but a useful helper; the active faculties, the understanding and the reason, rule over the instincts and the passive faculties; the soul over the body; man over nature. . . .

The man of the tropical regions is the son of a wealthy house. In the midst of the surrounding abundance, labor too often seems to him useless; to abandon himself to his inclinations is a more

[70] Semple, op. cit. pp. 52–53.
[71] Guyot, op. cit. pp. 268–271.

easy and agreeable pastime. A slave of his passions, an unfaithful servant, he leaves his faculties, the talent God has endowed him with, uncultivated and unused. The work of improvement within him is a failure.

The man of the polar regions is the beggar, overwhelmed with suffering, who, too happy if he but gain his daily bread, has no leisure to think of anything more exalted.

The man of the temperate regions, finally, is the man born in ease, in the golden mean, the most favored of all conditions. Invited to labor by everything around him, he soon finds, in the exercise of all his faculties, at once progress and well-being.[72]

Professor Giddings was the first writer to work out a comprehensive theory of the influence of the physical environment which gives due weight to psychic factors.[73] His theory may be characterized in the two following propositions, namely, that the character of the environment determines the composition of the population, and that the composition of the population determines the mental characteristics of the group. He finds that there are four fundamental forms which an environment may take: those which are poor and isolated; those which are poor and accessible; those which are rich and isolated; those which are rich and accessible.[74] He then turns to a description of the types of social population which are produced by each of the above environments. In the poor and isolated environments the population is sparse, simple and homogeneous in composition, and usually a genetic aggregation. In the poor and accessible environments the population is

[72] Ibid. pp. 268–271.

[73] "A Theory of Social Causation." *Publications of the American Economic Association*, Third Series, Vol. V, No. 2, pp. 139–174.

[74] Ibid. p. 154.

usually a genetic aggregation, but from the unattractiveness of the home land and the ease of getting away, a selective process goes on which generally results in a deterioration of the population owing to a migration of the most active members of the group. In the environment which is rich and isolated we also usually have a genetic aggregation but the population usually becomes so dense as to force periodic migrations. In the environments which are rich and accessible we find, on the contrary, a most composite population flocking there from all parts of the world. The population in such an environment is usually made up through early conquest and later immigration, so that the population is both compound, as made up of conquered and conquerors, and composite as made up of immigrants and native born.[75]

When he analyzes the types of organization to be found in the above populations Professor Giddings holds that those who dwell in the poor and isolated and the poor and accessible environments, being mentally and physically homogeneous, are dominated by a strong sense of kinship; coöperation is spontaneous; the chief social bonds are kindliness and neighborliness; and the social organization is simple. In the rich and isolated environment, the population though homogeneous is very dense. This density gives rise to a tendency for inequalities to develop and for a differentiation to arise which divides the group into dominant and subordinate classes. The group is sympathetic, engages in spontaneous coöperation, and its social bonds include allegiance to leadership and the contagious forms of popular emotion. In environments which are

[75] Giddings, loc. cit. pp. 154–157.

rich and accessible every variety of mental difference is found, but usually the psychic variations have less weight than the physical, since assimilation tends to go on more rapidly than amalgamation.[76] Even the prevailing types of social theories held by a group are dependent in the final analysis upon the physical environment for they directly depend upon the type of population, which is in turn produced by its physical environment. In the poor and isolated or the rich and isolated environments which produce a kindred community we have a theory of social origins based on the notion of brotherhood. In the homogeneous communities which develop in the poor but accessible environments there arise the theories of a consciousness of kind and natural justice. In the heterogeneous group which develops in the rich and accessible environment the type of social theory varies with the nature or stage of social evolution and assimilation. If such a community is made up of wholly miscellaneous elements the prevailing social theory will be that might makes right. If the society has been created by invasion and conquest there will develop the race or class conflict theory of political sovereignty. When, however, the original conquerors become weakened and their position has to be sustained through intrigue, social theory takes on the conspirital cast reflected in the doctrines of Machiavelli. When social development proceeds further, so that a considerable degree of likeness has developed in the group, there grow up the contract and legal sovereignty theories of political organization. Finally, when with a nearly perfect assimilation, homogeneity and the resulting consciousness

[76] Ibid. pp. 158–159.

of kind have been produced, there originate the highest or the idealistic theories of social origin and development.[77]

Considering the effect of the tropics upon mankind, Professor Robert DeC. Ward maintains that in such an environment nature is too bountiful to produce the environmental stimulation necessary for progress. Will-power and the provident traits are undeveloped in the tropical zone. Here food is easily provided throughout the year with only the slightest necessity for physical exertion. There is no need of exertion to provide for the daily wants of the individual and the lack of any seasonal changes makes it unnecessary to exercise foresight in providing food, clothing, and shelter for a cold and unproductive portion of the year. Nature does so much for man in the tropics that it paralyzes the will to develop a higher civilization and discourages all efforts at extensive improvement of their surrounding institutions.[78] In the polar districts, on the other hand, the flora and fauna from which man obtains his food and clothing are so meagre, scarce and difficult to obtain and the relatively warm season during which they can be most effectively secured is so short that practically all the time and energy of man in these colder regions is absorbed in procuring the most elementary necessities of life. Whereas in the tropics the very abundance discourages the creation of any energy at all, the adversity of the polar environment absorbs all of the energy of the inhabitants in obtaining those things which barely make life pos-

[77] Giddings, loc. cit. pp. 172–174.
[78] Ward, op. cit. pp. 226–8.

sible and leaves no surplus from which to evolve a higher civilization.[79]

Between these extremes of abundance and scarcity lies the temperate zone with its change of seasons which require the exercise of foresight, and its potential plenty if man is willing to endure moderate exertion. It is obvious that such an environmental situation is far better adapted to the production of civilization than that of either the tropics or the polar regions, and it is not difficult to understand why all the higher civilizations have developed in the temperate zones.[80]

Professor J. Russell Smith has similar views regarding the unfavorable effects of tropical abundance. He holds that "civilization is a product of adversity," and that man thrives best in situations where he must work or starve. In the tropics nature is too lavish, and man does not acquire habits of industry because it is possible for him to satisfy his wants without exertion. His needs in the way of shelter and clothing are meagre; a few banana plants and a patch of sweet potatoes, with fruit and game from the forest and fish from the streams, supply his food. Nothing in the way of progress is possible under such conditions and "lands of perennial plenty have never been lands of power." To be at his best, man must have obstacles to overcome. "The great civilizations of all time seem to have arisen where nature made production possible only a part of the year, and thus made it necessary for man to work and save up for the time when he could

[79] Ibid. p. 324.
[80] Ibid. pp. 272–4.

not produce."[81] Professor Smith's general position on the influence of environment is indicated in the following passage:

> To an extent little appreciated, the environment makes the race. It is a common mistake of the historian to give the idea that peoples have certain qualities inherently. It is much more correct to say that primitive or savage peoples are primitive or savage because of the niggardliness or peculiarities of nature's gifts to the land in which they happen to live, and not because of bad qualities which they may inherently possess.[82]

Professor Huntington adds his testimony to the value of a non-productive season for the development of foresight and ambition. Outlining what he considers the environmental conditions most conducive to man's rapid advancement he says "that the relation of summer and winter shall be such that with foresight every man can support himself and his family in comfort the year around, while without foresight he and his will suffer severely."[83]

Probably the most noteworthy contribution to anthropogeography by a Frenchman since the publication of Reclus' elaborate work is found in *Human Geography* by Jean Brunhes, professor of geography in the *Collège de France*.[84] Brunhes is not an extremist in the geographical interpretation of social and historical processes. He is very guarded

[81] J. Russell Smith, op. cit., pp. 5–8. See also *The World's Food Resources*, New York, 1919, by the same author.

[82] Op. cit. p. 4.

[83] Huntington, *The Pulse of Asia*, p. 382.

[84] New York, 1920, translated by Le Compte. There is an excellent review of Brunhes' work by Paul Mantoux which is reprinted in the preface, pp. xi–xv.

in his generalizations, holding that while in the physical sciences there are relations of causality, in anthropo-geography the relations are simply those of connection. Mantoux says that the book is not an abstract exposition of a science regarded as already complete, but more a program of the author's aspirations, accompanied by a perpetual invitation to study and reflection.[85]

Natural resources, says Brunhes, have profoundly influenced the life of man since the remotest antiquity, but it should be noted that the influences he mentions are indirect. The spices of India have been powerful stimulators of commerce; "salt has played a greater rôle in history than gold"; the effect of coal in bringing men together has been prodigious.[86] Natural products everywhere have limited man's choice of food, his clothing, and the character of his dwelling.[87] Most potent and far-reaching of all has been the effect of water, which has limited the location of man's abode, has aided him in his quarrying and mining, and is as essential for the raising of animals as it is for the cultivation of the soil. As man's knowledge increases it does more. It turns his mills, it runs his factories and finally, harnessed to modern power plants, it has supplied undreamed of facilities for manufacturing and transportation.[88] "Water is, then, associated with all human life, and, if Ratzel could say at the beginning of his *Politische Geographie:* 'Every state is a bit of soil and humanity,' let us take this phrase and complete it: every

[85] Mantoux, loc. cit.
[86] Brunhes, op. cit. p. 24.
[87] Ibid. pp. 36 ff., pp. 74 ff.
[88] Ibid. pp. 52–60.

state and even every human group is a blend of a bit of humanity, a bit of soil, and a bit of water.'' [89]

Among the more important contributions to the data, if not the theory of anthropogeography have been the recent comprehensive handbooks on commercial and economic geography, a field which Goetz in particular has opened up in Germany.[90] Of such the work of George Goudie Chisholm is one of the most thorough and widely used.[91] It is an elaborate compendium of facts on commercial geography including climate, topography, natural resources, manufacturing and commerce.[92]

Chisholm holds that commerce exists because of the diversified geographical conditions which give various parts of the earth distinct advantages in the production of certain commodities, the distribution of these commodities and the equalization of advantages in productivity being the chief function of commerce.

The great geographic fact on which commerce depends is that different parts of the world yield different products, or furnish the same products under unequally favorable conditions. Hence, there are *two great results of commerce;* the first, *to increase* the *variety* of commodities at any particular place; the second, *to*

[89] Brunhes, op. cit. p. 57.

[90] Wilhelm Goetz (1844–1911) was a most prolific writer, his works including: *The Task of Economic Geography; Trade Routes in the Development of World Commerce;* various text-books including his manual, *Economic-Geography,* in which he stressed the influence of the physical environment upon the economic development of Bavaria; a two volume *Handbook of the Historical Geography of Bavaria; Physical Geography of the Kingdom of Bavaria; The Land of the Franks; Historical Geography;* and numerous articles and monographs on economic and commercial geography.

[91] *Handbook of Commercial Geography,* 8th edition, London, 1914.

[92] The book contains little theory, that which exists being found in pages 1–63 and in the introduction to the 8th edition. It is almost exclusively descriptive.

equalize more or less according to the facilities for transport, *the advantages* for obtaining any particular commodity in different places between which commerce is carried on.[93]

There are two chief types of advantages possessed by different localities and peoples which give rise to commerce, namely, natural or geographical advantages, such as resources and favorable position, and historical advantages, namely the possession of such things as a stable government or superior productive technique.[94] Commercial history and geography is a complex resulting from the working out of these two sets of circumstances—geographical and historical. Chisholm preserves a well balanced attitude by refusing to place undue stress upon mere physical geography, and by emphasizing the dynamic element of human endeavor in manufacturing and commerce.[95] He maintains also that the greatest advantages from commerce can come only when "every kind of production is carried on in the place that has the greatest natural advantages for the supply of a particular market."[96]

Chisholm makes no important contributions to anthropogeographical theory, but he states clearly the function of commerce in civilization and indicates the geographical foundations of commercial development. His work is valuable as a source of information for the geographical background of a very important phase of modern life.

Andrew Reid Cowan makes an ingenious contribution to

[93] Op. cit. p. 1.
[94] Ibid. p. 7.
[95] Ibid. pp. 1–2, 6–7.
[96] Ibid. p. 6.

anthropogeography in his work entitled *Master-Clues in World History.*[97] His theory is that human progress has come about chiefly through group contact and racial intermixture. But this contact and intermixture must be of the proper amount if progress is to follow. If there is too much conflict and intermixture culture is destroyed; if there is too little stagnation results. Cowan endeavors to show how geographic conditions affect progress by promoting or preventing the proper amount of race contacts.

Cowan holds that the most important process in historical development up to the present has been a struggle between nomadism and agriculture. These two types of economy might readily have developed through coöperative activity as at present, but as a matter of fact their growth has been of a different character. Agricultural life greatly increases wealth and population but decreases initiative, physical courage, and the development of the predatory instincts. Nomadic life is far better adapted for training people in warfare and pillage. Hence as soon as agriculture produced a sufficient surplus to provide something worth robbing, the nomads, impelled by the principle of the "greatest gain with the least effort," began a series of assaults upon agricultural communities.[98] As agriculture is better adapted for the production of that surplus which is essential to progress, agrarian life is superior to the nomadic for the development of culture. Therefore, says Cowan, the centers of progress have been located in those areas which possessed sufficient fertility to promote

[97] London, 1914.
[98] Ibid. pp. 31 ff.

prosperity and sufficient geographic protection to prevent invasions by nomadic peoples. The invention of gunpowder was epoch-making in rendering it possible for more prosperous and cultured peoples to protect themselves against invasion by backward peoples.[99]

[99] Ibid. pp. 159 ff.

CHAPTER VII

THE SOCIAL IMPORTANCE OF LOCATION AND ACCESSIBILITY

TO Karl Ritter is usually assigned the credit for first emphasizing the influence of location and accessibility upon social processes, but the idea did not originate with him and a number of earlier writers dwelt upon it at considerable length. Strabo presents a careful analysis of the effects of both location and accessibility, and the significance of these two factors was well understood by such writers as Cicero, Aquinas, Bodin, Montesquieu, Heeren and Ferguson, although location was to Bodin chiefly a question of astral influences and to Montesquieu largely a matter of climate.

Strabo, the Greek geographer, held that a location on the sea and a commercial life tend to undermine and corrupt good morals. This belief in the corrupting influence of commerce was quite general among the ancients.[1]

> And this is still the opinion entertained of them (the Scythians) by the Greeks; for we esteem them the most sincere, the least deceitful of any people, and much more frugal and self-relying than ourselves. And yet the manner of life customary among us has spread almost everywhere, and brought about a change for the worse, effeminacy, luxury, and over-great refinement, inducing extortion in ten thousand different ways; and doubtless much of this corruption has penetrated even into the countries of the nomades, as well as those of the other barbarians; for having once learnt

[1] See Ratzel, *Politische Geographie*, 1903 ed. p. 720 (note 2).

how to navigate the sea, they have become depraved, committing piracy and murdering strangers; and holding intercourse with many different nations, they have imitated both their extravagance and their dishonest traffic, which may indeed appear to promote civility of manners, but do doubtless corrupt the morals and lead to dissimulation, in place of the genuine sincerity we have before noticed.[2]

On the other hand, it was Rome's location on the sea with splendid harbors and a lucrative commerce which, combined with its geographic position among nations, made possible its attainment of world power. In fact, Strabo saw much in Rome's environment to account for its greatness—its position on the sea, its peninsular location and consequent safety from land attacks, its favorable climate and its excellent water supply.[3]

The products of an isolated environment, says Strabo, are a lack of refinement and good manners among the people, along with a harshness and ruggedness of character. In the passage which follows the converse is also implied, i. e., that an accessible environment tends to produce good manners, and great refinement of character:—

The rough and savage manners of these people is not alone owing to their wars, but likewise to their isolated position, it being a long distance to reach them, whether by sea or land. Thus the difficulty of communication has deprived them both of generosity of manners and of courtesy. At the present time, however, they suffer less from this both on account of their being at peace and the intermixture of Romans. Wherever these influences are not so much experienced people are harsher and more savage. It is probable

[2] Strabo, *Geography*, Bk. VII, chap. iii, sec. 7.
[3] Cf. H. F. Tozer, *History of Ancient Geography*, pp. 246–7.

that this ruggedness of character is increased by the barrenness of the mountains and some of the places which they inhabit.[4]

In the opening chapter of his *Commentaries on the Gallic War* Julius Cæsar voices the classical prejudice against commerce as a corrupter of morals, along with the idea that people are brave in proportion to their lack of civilization, the important factor in each case being the degree of accessibility:

> Of all these people the bravest are the Belgæ; for they are the furthest removed from the civilization and refinements of the Province, and traders very rarely visit them with the wares which tend to produce moral enervation.[5]

Cicero's contributions to environmental theory are found in his comments upon the wisdom displayed by Romulus in the selection of a site for his capital. Cicero considered the choice of a site some distance from the seashore an act of wisdom because of the military disadvantages of a location by the sea. An inland city can always tell when it is in danger of attack, for the movements and designs of its enemies are easily discerned, and it is not likely to be taken by surprise. But a city on the sea is easily taken by surprise, as a fleet can appear suddenly and make an attack without warning.[6]

Cicero held that a maritime location is likely to lead to the corruption of national customs and institutions. For commerce brings in foreigners and foreign customs, and these destroy the purity of native manners and cus-

[4] Strabo, op. cit. Bk. III, chap. iii, sec. 8.
[5] Trans. by T. Rice Holmes.
[6] Cicero, *Republic*, trans. by Yonge, Bohn's Classical Library, Bk. I, chap. iii.

toms. Also, seafaring populations are restless, preferring travel and commerce to military discipline and agriculture. Moreover, a maritime location stimulates luxury, for it brings in all sorts of novelties and luxuries from abroad. Their location on the sea led to the downfall of Corinth and Carthage, and even of all Greece. In fact, the single advantage he grants a maritime location is that it allows a people to have at its doors the products of the whole world, and to ship its surplus products to the extremes of the earth.[7]

This single advantage of accessibility was secured by Romulus while avoiding the disadvantages of a maritime site. For he located Rome on the Tiber, and foreign products could be brought in and surplus products shipped away, and yet there was no danger of sudden attacks by hostile fleets. The Tiber moreover gave communication with the inland regions of western Italy. Finally, the situation of Rome on hills made her position easily fortified and well-nigh impregnable, not to mention the healthfulness of such an elevated location. Cicero asserts that if Rome had been situated in any other part of Italy it could never have been master of the world.[8]

Cicero's contribution, dealing almost exclusively with the single question of location, adds little to the views held by other ancient writers. Holding the common view of the corrupting influence of a maritime location, he cites the downfall of the Greeks as an example. Strabo, the Greek, held the same view, but he went to the Scythians for his illustration.

[7] *Republic*, Bk. II, chap. iv.
[8] Ibid. Bk. II, chaps. v and vi. Cf. Mouten, op. cit. pp. 20–21.

In Book V of his *History of Rome* Livy summarizes the reasons given by Cicero for Rome's supremacy:—

> Not without good reason did the Gods and man select this spot for the building of Rome, where are most healthful hills, a commodious river, whose stream brings down the produce of the interior countries, while it opens a passage for foreign commerce; the sea, so near as to answer every purpose of commerce, and yet at such a distance as not to expose to danger from the fleets of foreigners; and in the center of the regions of Italy, a situation singularly adapted by its nature to promote the increase of a city.[9]

Commerce, says Aquinas, brings in a foreign population, which leads to corruption. He holds also that commercial pursuits unfit a population for war, and that they should be limited to the exportation of excess products and to the importation of the few necessities which the people might require from abroad.[10] His city-state, therefore, was not to be located on the sea, because such a location, besides the likelihood of its stimulating commerce, and thereby corrupting good morals, is unhealthful. The city should not be too remote from the sea, on the other hand, because the sea has its advantages in making it possible to secure goods from abroad. Thus an intermediate situation is preferable here as in the matter of latitude.[11]

Montesquieu finds that mountaineers are liberty loving, because liberty is about all they possess worth defending, and their natural position makes defense comparatively easy. He holds also that countries are not as a rule cultivated effectively so much because of fertility as because

[9] Trans. by Baker.
[10] Aquinas, op. cit. chap. iii.
[11] Littlejohn, *The Political Theory of the Schoolmen and Grotius*, p. 96.

of their security against foreign conquests.[12] Islanders resemble the inhabitants of mountainous countries, especially in their love of liberty, for the sea protects them from conquest and absorption by a great empire.[13] He finds a reason for the despotism of Asia in the absence of conspicuous geographical barriers and holds that government in Asia ought always to be despotic, lest small divisions spring up which would be inconsistent with the natural boundaries of the country.[14]

Montesquieu takes a more hopeful view of the influence of commerce upon the character of a people than did Strabo, Cæsar, Cicero and other ancient writers. He stresses the broadening effect of commercial pursuits, and speaks of "agreeable manners" rather than over-refinement and corruption. "Commerce," he says, "is a cure for the most destructive prejudices; for it is almost a general rule, that wherever we find agreeable manners, there commerce flourishes; and that wherever there is commerce, there we meet with agreeable manners." [15]

Heeren treats the geography of Phœnicia at considerable length, and the importance of its peculiar situation in the development of its commercial and colonizing activities is clearly indicated.[16] The history of Babylonia is prefaced by a chapter bearing the significant title "The Land and People," and the geography of Babylonia is carefully examined, especial emphasis being given to the importance of the Tigris and Euphrates rivers in the development of

12 Montesquieu, op. cit. Bk. XVIII, chaps. iii–iv.
13 Ibid. chap. v.
14 Ibid. Bk. XVII, chaps. ii–vi.
15 Ibid. Bk. XX.
16 Heeren, op. cit. Vol. I, sec. on Phœnicians.

Babylonian agriculture, industry and political life.[17] The geography of other countries is similarly treated, and another section deals with commercial routes of ancient Asia and their relation to the geography and industries of that continent.[18]

Ferguson holds that since the rivalry of peoples is as essential to their development as their peaceful intercourse and coöperation the regions best fitted for permanent progress are those which are broken up by the sea, by rivers, or by mountains. Such divisions produce a number of independent nations whose conflicts make for progress. He qualifies his assertion, however, by adding that in recent times the principle of the balance of power, rather than mere geographical barriers, has operated to keep national groups intact and in healthy conflict. As a rule, however, the most successful nations are those that have been located along the sea coast, for the sea is a barrier against enemies and an incentive to the development of commercial activities.[19]

Ritter attaches great importance to the influence of the configuration of the different continents upon the history of their respective populations. He sees great significance in the oval form of Africa, the rhomboidal form of Asia and the triangular shape of Europe. The more compact a continent is and the more uniform its geographic conditions, the more backward and homogeneous will be its culture. Africa, being both compact and uniform, is conspicuous for the backwardness and uniformity of its

[17] Heeren, op. cit. Vol. I, pp. 371–412.
[18] Appendix to Vol. II.
[19] Ferguson, op. cit. 182–184.

culture.[20] Europe being neither compact nor uniform in its geographical conditions, "accessible by water even to the very heart," has been able to develop the highest of all civilizations. Being broken up by seas and bays and possessing an enormous coast line in comparison with its area, it has been best adapted to the reception and diffusion of culture.[21] And finally Asia having both uniformity and compactness on the one hand and an irregular coast line on the other, illustrates both homogeneity and backwardness in culture and sharp individuality and high development of civilization. In the great isolated interior district, the culture is uniform and has remained unchanged for centuries. Along the peninsulas of the coast, however, have developed many of the famous civilizations of history.[22] Europe's long coast line and its peninsulas, according to Ritter, have led to the development of nautical science in Europe, and consequent control of the seas. Great importance is attached also to the islands lying off the coast of Europe which aided the transfer of civilization from Asia to Greece and Italy.[23] Islands are not an unmixed benefit, however, for if a continent is too much broken up, like Polynesia, the culture will be backward as well as varied.[24] Europe being midway between the extreme compactness of Africa and the extreme diffusion and incoherence of Polynesia, has been able to develop a civilization both varied and advanced.[25] While earlier

[20] Gage, op. cit. pp. 337–9.
[21] Ibid. pp. 342–3.
[22] Ibid. pp. 339–340.
[23] Ibid. p. 345.
[24] Ibid. pp. 347–8.
[25] Idem.

writers like Bodin had attributed Europe's superiority to her location midway between the hot and cold zones, Ritter found its superiority to result from geographic characteristics midway between those of diffused Polynesia and compact Africa.

Peschel maintains that even where commercial products are at hand the absence of good harbors to make them accessible may, and usually does, condemn a locality to cultural backwardness, stagnation and isolation. Examples of such backward civilizations are: Australia, down to 1850, and Africa, due to a lack of harbors and navigable rivers and to the absence of any important products until the recent discoveries and explorations of the continent.[26] Peschel thus assigns to the factor of accessibility an importance practically equal to that of natural resources.

Ratzel emphasizes the importance of natural conditions of habitat upon the course of history. Topography and configuration, he finds, demarcate areas for population and make possible cultural specialization in distinct regions. Isolation and protection are a great boon in the origin and early development of a state, but they are likely to prove fatal later by causing overcrowding and stagnation of culture. Natural boundaries are valuable to a state, not merely as protection but in giving greater definiteness, distinctiveness, coherence and unity to its political development.[27]

Considering the importance of geographical situation Ratzel finds that it has exerted a primary influence upon historical development, an example being the relation of

[26] *The Races of Man*, pp. 209, 215.
[27] Ratzel, loc. cit. pp. 73–75.

the development of Greece to its location "on the threshold of the Orient"—a fact to which "everything else is subordinate." The more significant and vital any area is for the welfare of a number of states, the more important is the possession of this district by any single state. A geographical situation which brings about independence or self-dependence is of great value. On the other hand, it is particularly disastrous for a state to be situated where it is cut off from the sea and surrounded by other states. Finally, geographical situation bears an important relation to historical repetition, for nearly identical situations give rise to generally similar types of evolution and political organization.[28] All in all, it is "the most important of all geographical considerations," and the weight Ratzel assigned to this single factor is indicated in the following passage:

> Similar locations give rise to similar political models. Since there are several types of location, it follows that the histories of such locations assume typical characters. The contrast between Rome and Carthage, their association with each other, exhibiting the reciprocal action of the characters of the northern and southern Mediterranean coasts, is repeated in similarly formed situations in Spain and Morocco, in Thrace and Asia Minor, and on a smaller scale in the Italian and Barbary ports. In all these places events similar to those in Roman and Punic history have taken place. Japan and England are unlike in many respects; yet not only the peoples but also the political systems of the two island nations have insular characteristics. Germany and Bornu are as different from each other as central Europe is from the interior of Africa, but central location has produced the same peculiarity in

[28] Ibid. pp. 80–82.

each,—a source of power to the strong nation, of ruin to the weak.[29]

The significance of harbors and coast contours for social evolution has been recognized by all students of anthropo-geography since Ritter's time. Coast peoples, says Ratzel, are different from those of the same nation who dwell in the interior; having more contacts with other peoples they are richer in both commerce and knowledge.[30] Nor are rivers without their significance for social processes. Navigable rivers are the logical continuation of the sea in opening up lands to voyagers and traders. They provide the point of entry first for commerce and then for political occupation. It has generally been supposed that the movement of peoples along the course of rivers has been in a direction agreeing with the current of the stream, but as a matter of fact many more have proceeded from the mouth towards the source. Rivers are not only a great aid in the settling of a country but also in the period of its development when they become the routes of domestic or inland commerce. Nor have rivers been without their significance for the evolution of states. River deltas, with their combination of accessibility, fertility and protection, were the natural areas for the development of early civilizations and political groupings. At a later period rivers performed a valuable function in promoting national unity. The possession of a junction of rivers gives a key to the areas drained, yet sufficiently wide and deep rivers make good boundary lines.[31]

[29] Ratzel, loc. cit. p. 81.
[30] Ibid. pp. 92–93.
[31] Ibid. p. 95.

A uniform and accessible habitat, says Ratzel, naturally promotes political unity, while diversified conformation—a variety of "orographic features"—may divide a state and make political unity well-nigh impossible, as in the case of ancient Greece, but if the diversities lend themselves to common control they may promote unity, as in the United States, Austria-Hungary and Italy. Mountain ranges are natural political barriers and boundaries. A mountainous habitat tends to produce a spirit of independence, a love of liberty and a degree of military power quite out of proportion to the relative numbers in the population. Mountains tend to produce isolation and cultural stability, while lowlands promote racial and cultural mixture and the migrations and movements of peoples. On account of the importance of mountains as barriers great political, military and commercial significance attaches to the possession of mountain passes. Forests and jungles often act as barriers to the movements of peoples with an effect comparable to that exerted by mountains and gorges. All forms of configuration, which promote isolation, as well as over-exuberant flora, inevitably produce political and cultural stagnation.[32]

Geographic proximity and geographic remoteness, says Miss Semple, manifest their influence in mixtures of populations and in the ease or difficulty of political control. Natural barriers have been most influential in determining historic movements and in keeping populations protected or isolated. On the other hand, highways made by nature, such as river valleys and mountain passes, establish lines of communication and facilitate the movements of peoples.

[32] Ibid. pp. 96–103.

Regions which show a great similarity of culture usually do so because of their geographic resemblances. Man is thus always and everywhere a product of the earth's surface. Geographic position is also a factor of great importance in the evolution of world relations, for upon the location of a country and its means of communication with other parts of the world depends all commercial activity. Facilities for communication, however, are continually changing with man's inventive powers, and world relations are thus in a constant state of change and development.[33]

In any community there is also an influence of both direct and remote geographic factors. The indirect effect is often more important than the direct, and this is a point which the Ratzel-Semple system emphasizes more than its predecessors. The isolation of India, for example, has been more important in its development than its great mountains and plains. Mountains discourage civilization not because they impress the imagination, but because they produce isolation, Buckle's doctrine to the contrary, notwithstanding.[34] Many are the effects of isolation—purity of race, undeveloped genius, ignorance, superstition, and in general a backward civilization.[35]

Movements of peoples are obstructed by such natural barriers as mountains, deserts and swamps, and are facilitated by river valleys and treeless plains. The power of rivers, lakes, bays and oceans to hinder or aid varies "according as navigation is in a primitive or advanced stage." In cases where a people is isolated by environ-

[33] Semple, op. cit. pp. 2–14.
[34] Ibid. pp. 18–19.
[35] Ibid. pp. 19–20.

mental barriers their natural traits and customs tend to be preserved; where the region is so accessible that new ideas and customs pour in from all sides there follows a general levelling and blending of all peculiarities and customs, "and the people as a whole approach to the composite type of civilized humanity." Isolation makes for homogeneity since it tends to keep out foreign ideas, or to make their entry gradual and difficult; accessibility has the opposite effect, facilitating the mingling of peoples and the free exchange of ideas and commodities.[36] Provincialism is the rule in isolated regions; cultural uniformity follows environmental uniformity; variegated geographic conditions produce variegated cultures.[37]

Treitschke pays a great deal of attention to England in his purposeful survey, particularly in the section on the influence of location. During the Viking period, he finds, England's insular position exposed her to attacks from abroad, while in modern times it has been her chief protection.[38] England is particularly favored, not only by its insular position, but by the configuration of the land and the presence of many harbors and navigable rivers.[39] A seaboard, in Treitschke's opinion, is particularly important in the growth of a state, but of course, it depends upon the temperament of the people and their natural resources as to how far they will develop the possibilities of commerce. A great national development is impossible, however, without access to the sea.[40]

[36] Ibid. pp. 43–45.
[37] Ibid. pp. 117–119.
[38] Treitschke, op. cit. p. 207.
[39] Ibid. p. 211.
[40] Ibid. pp. 212–13.

There are many other physiographical and geographical influences which affect society. Mountain ranges are valuable on the boundary if they are not so high as to shut off communication.[41] Within a state mountain ranges tend to localize and diversify culture, as may be seen in the contrast between the diversified southern German culture and the uniform northern German civilization. Mountains that are too high naturally bring isolation and stagnation.[42] Great civilizations, says Treitschke, in agreement with Metchnikoff, have grown up mainly along the river valleys. From the earliest times civilization has followed such valleys as the Indus and the Nile; and Germany, whose environment is in many other respects unfavorable, is fortunate in possessing her river from end to end. "Our Rhine remains the King of Rivers."[43] A variegated topography is of great importance to a state because it creates a differentiated industrial development and diversified economic opportunities, but its diversity must not be too great lest it create differences which threaten the national unity.[44] A strong nation, says Treitschke, must be compact and avoid a ragged boundary. Rivers he considers a bad boundary because they are a uniting rather than a dividing factor.[45]

Alfred Kirchhoff holds that European civilization is a unit because its mountains and bays are not impassable, and that Asia under opposite conditions has no common

[41] Treitschke, op. cit. pp. 213, 220.
[42] Ibid. pp. 213–14, 221.
[43] Ibid. p. 215.
[44] Ibid. pp. 212–18.
[45] Ibid. pp. 218–20.

civilization.[46] The sea also has been a great aid to civilization, and rivers are very significant extensions of the influence of the sea because they are the pathways for progress and for new centers of civilization.[47] Island nations are compelled to develop sea power, and an extensive sea coast gives power to a state by making defense easy and unity possible among the population.[48] For Germany he finds the lesson that "The glory of the German Empire lies firmly anchored on the ocean." [49]

Reclus discusses the topographical factors, such as mountains, forests, islands, and marshes, which produce general isolation with its various sociological peculiarities. A mountainous habitat most effectively impresses upon its inhabitants unique and easily detected characteristics.[50] Being normally isolated it is usually the home of a highly homogeneous population and of an arrested and backward civilization.[51] The homogeneity of mountain dwellers tends to be more a cultural than an ethnic homogeneity for these habitats appear to have been populated by the descendants of vanquished peoples of every ethnic strain who have fled to the mountains for safety.[52] It would thus seem that, being descended from those who have failed in the struggle for existence, they would be of an inferior

[46] Alfred Kirchhoff, *Man and Earth: the Reciprocal Relations of Man and his Environment*, London and New York, 1914, pp. viii, 223. This is an English translation with some additions of Kirchhoff's German work, *Mensch und Erde, Skizzen von den Wechselbeziehungen Zwischen beiden.*

[47] Ibid. p. 10.

[48] Ibid. pp. 45–48.

[49] Ibid. p. 48.

[50] Reclus, *L'Homme et la Terre*, p. 68.

[51] Ibid. pp. 68–72.

[52] Ibid. p. 72.

biological or social type. As a further obstacle, mountain habitats are made practically polar by the snows of winter, which are often so severe as to force a temporary emigration.[53]

The physical characteristics of a mountain environment are reflected in its political organization, which consists most frequently of a number of minute local republics. These are better adapted for defense than for conquest, and mountain dwellers normally remain free, but petty in their political organizations. In general, mountain environments, like those which are too cold, too hot, too dry, or too wet, having a vast number of obstacles to overcome, are not adapted to a progressive population; for an intermediate type of environment which has enough obstacles to compel effort, but not to discourage or exhaust the people, is the best adapted to the promotion of social progress.[54]

Inhabitants of dense forests are usually the most primitive and backward of peoples, for their habitat is the best adapted of all environments to imprison a people, to keep their civilization stagnant, and to prevent the growth of those large social groups which are so indispensable to progress and social evolution. An island environment, unless so situated as to constitute a commercial center, suffers from isolation and finally, lakes, swamps, and fens, while in early periods of civilization they may have served an important function as a protective agency, ultimately become a chief cause of social stagnation.[55]

[53] Reclus, op. cit. p. 75.
[54] Ibid. pp. 76–80.
[55] Ibid. pp. 82–88.

Reclus next turns to those environmental conditions which promote social movements, intermixture and hence social progress, namely, plains, the ocean and seas, and especially the great river basins. He holds that in contrast to the mountains with enclosed valleys, the steppes, the boundless prairies with their slight undulations of the soil, their ravines of no great depth, their infrequent rivers, their shallow lagoons, are preëminently the district of free movement and limitless horizon. If, however, the plain is extensive, bare, unvaried, and isolated from contact with outsiders, it is likely to produce a monotony of habit and life which brings about an arrested civilization which can be altered only by some shock such as the incursions of foreigners, long drought, fires or other events which force emigration.[56] In particular Reclus regards river basins as the habitat most conducive to a progressive civilization.

If stagnant or tranquil water isolates men, running water usually unites them. The valleys enclosed by mountains, the forests and the marshes, the islets and the lakes are conservative elements in the history of humanity; the rivers are, in comparison, the principal agents of life through navigation, through agricultural progress, the migrations from place to place and what is called by the comprehensive word "civilization." . . .

The great civilizations from which we have sprung, and without which there would be no humanity in the modern sense of the word, would not have lived, if there had been no Yellow River, Blue River, no Singh or Ganges, no Euphrates or Nile, no Senegal or Niger. It is with filial piety that the thinking man pronounces such great names.[57]

[56] Ibid. pp. 80–81.
[57] Ibid. pp. 89–102.

One of the best known French anthropogeographers since Reclus is Camille Vallaux, professor of geography at *L'Ecole navale.*[58] In his preface he criticizes Ratzel for the subjective and imaginative element in the theories set forth in his *Political Geography,* and says he proposes to cover the same field with the journalistic element omitted aiming to make anthropogeography a real science.[59] After a few preliminary generalizations, he considers separately the various factors involved in the geographic environment, warning his readers, however, against the danger of attempting to treat any of them as a single cause.[60] He enumerates these factors in what he regards as the order of their diminishing range of operation, namely, climate, temperature, water, deserts and the configuration of the land. In discussing the influence of configuration upon the state, he insists that plains with a moderate water supply are the localities where the minimum density of population necessary for political existence is most easily achieved, and that they are, therefore, the localities which witness the earliest developments of states. But the configuration of the land must always be considered in connection with the importance of seas, rivers and forests, though forests certainly have had much more influence in the past than they will have in the future.[61]

Vallaux reviews Ratzel's theories of the importance of *space* and *position* as fundamental factors in political geography. He rejects completely Ratzel's view of the im-

[58] Vallaux chief works are *Géographie sociale: le sol et l'état,* Paris, 1911, pp. iii, 420, and *Géographie sociale: la mer,* 1908.

[59] *Géographie sociale: le sol et l'état,* pp. 1–7.

[60] Ibid. p. 92.

[61] Ibid. pp. 117–142.

portance of space or territory, as such, for the state, asserting that this contribution of Ratzel's is nothing but a disguised and pseudo-scientific apologetic for German *Welt und Machtpolitik*.[62] To Ratzel's notion that geographical position is of importance for political institutions, he is more favorably inclined, but insists that it must be supplemented by the notion that environment has a direct bearing upon social and political differentiation. He evidently overlooks the fact that in works other than his *Political Geography* Ratzel did place great emphasis upon social differentiation as a resultant of geographic forces.[63]

Vallaux then proceeds to analyze the process of social and political differentiation resulting from the reaction of the group to the environment, and this is the essence of his contribution to anthropogeography. Differentiation produces that diversity in the social population which is indispensable to progress. It promotes both political and economic advancement through diversified occupations and the division of labor, and therefore, the more varied the geography of a region the more rapid its progress. As this means, also, an increase in political power, it follows, that highly differentiated states tend to expand and absorb adjacent groups dwelling in regions less favored by nature for the development of social and political differentiation.[64]

"The situation, the configuration, the structure, or the climate of a country," says Brunhes, "helps to explain the historical development of a people as a social organiza-

[62] Ibid. pp. 145 ff, esp. 166.
[63] Ibid. pp. 166–173.
[64] Ibid. pp. 174 ff., 244 ff.

tion," and he attaches particular importance to what he calls geological boundary lines such as the fall line of rivers flowing into the Atlantic in the eastern part of the United States. Along this "geological boundary" because of the cheap water power available, a long line of busy manufacturing cities has grown up extending north and south throughout almost the entire coast—a striking illustration of the way the character of a region conditions the economic life of the people.[65]

In addition to the economic effects of situation and configuration there are profound political results, in which an explanation may be found for certain political divisions which have long been considered abnormal. This is set forth by Brunhes in the following significant passage:

> Professor Theobald Fischer, in a very remarkable work on the Iberian Peninsula, explains clearly why Portugal has been able to preserve her historical and political autonomy. Portugal is nothing more than a peripheral zone such as the plains of Valencia or Andalusia, which border on all sides the central Spanish plateau; but Portugal alone is separated from Spain by the deep canyons of three great water courses and their affluents—a natural frontier more effectual than many mountain chains. In the second place, much more than any other region of the peninsula, Portugal is closely connected with the sea, and through her great estuaries the tide penetrates far into the land. And, finally, Portugal has lived a life of her own because, having the same products as certain other parts of the peninsula, she has had to turn away from Spain and toward the sea. Professor Fischer happily compares the geographical situation of Portugal, independent of Spain, to that of Holland, independent of Germany.[66]

[65] Brunhes, op. cit. pp. 19–23.
[66] Ibid. pp. 23–24.

The name of Metchnikoff, the Russian geographer, is usually associated with an analysis of river basin environments.[67] The river basin, he holds, furnishes a synthesis or summary on a small scale of all the possible environmental variations and influences:—

> The river, in every country, presents itself to us like a living synthesis of all the complex conditions of climate, soil, configuration and geological constitution of the adjacent territory. Its course, slow or rapid, the volume and the speed of its waters, dependent on rains, snows, the alternation of the seasons, and innumerable other climatic variations; the relief of its basin, the greater or less extension of the sea into which it flows determining the length and the sinuosity of its course; the nature of its bed, the scarcity or the prodigality of its alluvial deposits, of its organic detritus, of the mineral substances that it holds in suspension, rendering its waters clear or troubled, taking from them these properties, colorations, and varied taste, and augmenting or diminishing their plastic force or destructive power.[68]

It should be remembered, however, that Metchnikoff did not attach any overwhelming importance to the river basin as an environmental type, and that it was only a part of his projected discussion of fluvial, thalassic and oceanic environments, which he did not live to finish. His general theory will be discussed more fully in a later chapter.[69]

According to Spencer, the configuration of the earth's surface may aid and it may hinder social evolution. In a

[67] In addition to his theory of environmental influences set forth in his paper on *Social Causation*, Professor Giddings lays much stress in his unpublished lectures upon the importance of river basins in producing the various types of social and economic life and in giving rise to a completely self-sustaining community.

[68] Metchnikoff, *La Civilisation et les grandes fleuves historiques*, p. 185.

[69] See chap. ix, *The Geographical March of History*, pp. 209–212.

fertile region, capable of supporting a large population and surrounded by barren lands or hostile enemies, a change from nomadism to a settled life would be easily effected, for there coercion is easy. In deserts, mountains and fens, on the other hand, the nomadic life persists because the inhabitants are difficult to coerce, as instanced by the trouble England had in conquering Wales and the Highlands of Scotland. If the topography is variegated, social development is favored because it provides the variety of materials, opportunities and experience necessary to progress in industry and the arts of life.[70] The advantages of such an environment are to be seen in the history of Egypt and Babylonia, of Greece and Italy, of Europe as a whole, and of the new world civilizations of Peru, Central America and Mexico.[71] Conversely, uniformity of topography is a hindrance to progress because it does not allow variation in industry and opportunity.[72]

In Shaler's opinion, the location best fitted for the development of a strong independent nationality is one which is isolated and protected against invasion, possessed of sufficient area to support a considerable aggregation of people, and endowed with natural resources which foster industrial diversification.[73] Islands, peninsulas and regions walled in by high mountains are the "natural cradles" of great races. In this regard nature has favored Europe above all other continents, and, as a consequence,

[70] Spencer, *Principles of Sociology*, Vol. I, pp. 24–25.
[71] Ibid. pp. 26–27.
[72] Ibid. p. 25.
[73] Nathaniel S. Shaler (1841–1906) was an eminent American scientist, a pupil of Agassiz, and for many years professor of geology at Harvard.

the world's greatest peoples have been cradled there.[74] Discussing the Baltic area, which he believes to have been the homeland of the Aryans, Shaler holds that "from that great nursery of vigor we can well conceive the Aryan people, protected in their infancy by the isolation of their birthplace, in time going forth in their strength to dominate the world from eastern India to the Atlantic." The British Isles, the Scandinavian peninsulas, Greece, Spain, and Switzerland all were able to nurture great races because of favoring geographic conditions.[75]

The highly divided state of Europe has greatly favored the development within its area of isolated fields, each fitted for the growth of a separate state, adapted even in this day for local life, although commerce in our time binds lands together in a way which it did not of old. These separated areas were marvellously suited to be the cradles of peoples; and if we look over the map of Europe we readily note the geographic insulations which that remarkably varied land affords.[76]

In Africa, Australia and the Americas, on the other hand, we find a different situation—united lands rather than divided and segregated regions. These continents, says Shaler, important as they have been for the progress and development of peoples cradled elsewhere, have never

[74] Cf. A. T. Mahan, *The Influence of Sea Power upon History*, Boston, 1898. "It may be pointed out," says Mahan, "that if a nation be so situated that it is neither forced to defend itself by land nor induced to seek extension of its territory by way of the land, it has, by the very unity of its aim directed upon the sea, an advantage as compared with a people one of whose boundaries is continental. This has been a great advantage to England over both France and Holland as a sea power." p. 29.

[75] *Nature and Man in America*, New York, 1891, pp. 147–174.

[76] Ibid. p. 152.

actually produced civilizations of their own.[77] The civilizations of Northern Africa were cradled in other lands and their "national motives," therefore, were all exotic. In North America and Australia the geographic environment and not inherent racial qualities prevented the development of great nationalities. This was because the various local groups were not sufficiently isolated and protected from each other, and each feeble beginning in the arts invited invasions which swept away the very foundations of the higher civilization to which they might otherwise have attained.[78] In his emphasis upon the social importance of security against invasion Shaler resembles Ritter and both are distinctly foreshadowed by Montesquieu.

A glance at the geographic conditions of North America will show the observer, especially if he will compare the conditions with those of Europe, how unfitted is this continent to be the cradle-place of peoples. This continent is in the main a geographic unit. The detached masses which border it are, by the circumstances of climate or of surface, unfitted to give the isolation necessary for the nurture of people.[79]

That divorce and suicide are correlated with conditions of the physical or social environments rather than with race is brought out by Ripley in his discussion of the Alpine race with reference to the prevalence of these two evils. It has often been assumed from the general absence of suicide or divorce in those parts of France inhabited by

[77] A statement which the student of early civilizations is not likely to accept at face value.

[78] Shaler, op. cit. p. 152.

[79] Ibid. p. 168.

the Alpine race that some correlation exists between this racial type and immunity from these two social phenomena. That this correlation is not valid may readily be seen from the fact that both suicide and divorce occur with the maximum degree of frequency in the northern part of Italy, which is the greatest stronghold of the Alpine race. Therefore, though race might seem to be directly correlated with divorce and suicide if one nation only is considered, if several nations are investigated the racial explanations so contradict each other that these phenomena must be regarded as products of the physical or social environment or both.[80] The same destructive criticism may be applied to the attempt to correlate an abundance of artistic talent with a definite racial composition.[81] Finally, little validity can be assigned to the allegation that the Alpine race is inherently backward and conservative. The presence of a large amount of conservatism among members of the Alpine race does not constitute any necessary proof of any racial tendency in this direction. Rather, it is due to those geographic conditions which surround these people. In other words, it is a matter of isolation.

Our theory, then, is this: that most of the social phenomena we have noted as peculiar to the areas occupied by the Alpine type, are the necessary outcome, not of racial proclivities but rather of the geographical and social isolation characteristic of the habitat of this race. The ethnic type is still pure for the very same reason that social phenomena are primitive. Wooden ploughs pointed with stone, blood revenge, an undiminished birth rate, and relative purity of physical type are all alike derivatives from a

[80] W. Z. Ripley, *Races of Europe*, pp. 515 ff.
[81] Ibid. pp. 523–527.

common cause, *isolation*, directly physical and coincidentally social.[82]

Attention has already been called to Cowan's theory that human progress has come about through group conflict and racial intermixture, that geography conditions human progress in proportion as it facilitates or prevents the desirable amount of intermixture, and that the ideal situation for progress is sufficient fertility to promote prosperity and sufficient geographic protection to prevent invasions.[83] Human progress, he holds, is seriously obstructed both in the frigid zones and in the tropics. In the frigid zones the people are unable to utilize the mineral resources which lie beneath the snow and ice, and there is no chance for group contacts and "the friction of communities, customs and culture." In the tropics the overexuberant vegetation of the jungle is difficult to conquer even with modern mechanical methods, to say nothing of the primitive methods of savages. In deserts human progress is perhaps even less possible than in ice fields or jungles.[84] It is evident therefore that civilization has been centred chiefly in the middle regions.

In explaining the backwardness of native American civilization before European colonization, Cowan asserts that owing to the absence of barriers to protect agrarian communities against the nomadic Indians both North and South America remained in a state of savagery except in the relatively well protected regions of Mexico and Peru. "Because of the absence of physical barriers, attempt

[82] Ripley, op. cit. p. 529.
[83] Cf. Supra, pp. 151–153.
[84] Op. cit. pp. 16–24.

after attempt at tillage culture, wherever it tended to show itself, might be drowned out by ever renewed tides of barbarism originating perhaps thousands of miles away from the extreme margins of devastation, as with the Hunnish and Mongol invasions of the old world." [85]

In a geographical sense, if not in the cultural, says Mackinder, European history is and has been subordinate to Asiatic history and has been largely determined by it.[86] The pivotal point in the geographical basis of European history he holds to be the great Eurasiatic steppe region, uniform in topography, climate and fertility, and, since the territorial expansion of Russia, under a common political control. This region is surrounded by barriers on two sides—ice to the north and deserts to the south. To the west are found great river systems running from the forest region in mid-Europe to the Black and Caspian Seas, thus affording an opening for the horse-riding steppe peoples to find their way into Europe. From Greek times to the latest Turkish inroads these attacks of the steppe nomads upon European peoples have been a great factor in European history. "A large part of European history might be written as a commentary upon the changes directly or indirectly ensuing from these raids." Such raids have had significance for other regions than southern and mid-Europe. They have extended into China, India, Persia and the Near East generally, causing the fall of historic empires. The progress of discovery and navigation in

[85] Ibid. pp. 120–127.

[86] "The Geographical Pivot of History" in the *Geographical Journal*, April, 1904. Sir Halford John Mackinder is an enthusiastic contemporary British exponent of geographic influences. He was formerly reader in geography in Oxford University and director of the London School of Economics.

modern times has made possible the erection of counterpoises to this perennial expansion of the steppe-peoples. The discovery of the route to India and the East by way of the Cape of Good Hope has put western Europe in command of an outer ring of communication not accessible to those in the pivotal area. This has enabled Europeans to get in the rear of the steppe populations and to distribute and utilize their forces with mobility and effectiveness. The building of the Suez Canal has also greatly aided in this process of a European encirclement of the pivotal area, but both this and the cape advantage are being offset by the growth of a greater mobility in the pivotal area through the building of railroads.[87]

Mackinder is inclined to doubt the influence of the alleged desiccation of the Caspian region upon which Huntington lays so much stress as the cause of the movement of the steppe-peoples. He does not believe that this theory is proved and believes that these movements have rather been the outcome of a shifting of centres of social and political equilibrium in this pivotal region.[88]

From these theoretical generalizations Mackinder draws several practical conclusions. Russia is not now equal to the peripheral states, but there is great danger in any alliance of Russia with Germany which would give the former free and permanent access to the sea. Also there would be a real "Yellow Peril" if a Japan-dominated China should conquer the steppe area. England and Japan should act as forces on the margin to prevent the

[87] Mackinder, loc. cit. pp. 423–434.
[88] Ibid. p. 437.

internal expansion of the pivotal power—Russia.[89] In this way the Anglo-Japanese alliance of 1902 is fortified by arguments from history and geography.

In an article "Man-Power as a Measure of National and Imperial Strength" published in 1905 in the *National Review,* Mackinder sets forth another aspect of his general theory. He condemns the "shop-keeper" viewpoint which contends that national strength and development can be measured by statistics of exports and imports of salable commodities, and proceeds to discover criteria of his own. These he finds to be chiefly England's insularity and sea power. The latter has been a great bulwark of Great Britain in diplomacy as well as in actual war. It has won for Great Britain many diplomatic victories without a single fight. But there can be no permanent hope for British supremacy and safety in mere insularity. Other states are now building navies with the avowed purpose of contesting British primacy on the water, and Britain must prepare for future struggles. She must increase her white man-power and attract a greater loyalty from her dark man-power. "The right policy has for its conscious object to attain the greatest sum of man-power in all of its complexity—physical, intellectual and moral." This means that Great Britain must make alliances with foreign nations, must increase the population of white colonies, must attract the black populations by more sympathetic treatment, and must foster native English man-power at home by passing social legislation necessary to eliminate the human wastage now evident in modern unregulated capital-

[89] Ibid. pp. 436–7, 443.

istic industry and in the unhealthy homes of the workers. Such a policy would not be undesirable should there never be another war, for "there is such a thing as power to do good." [90]

Mackinder has combined and expanded these two articles in a little book entitled *Democratic Ideals and Reality: A Study in the Politics of Reconstruction.*[91] He argues with some justification that the World War has vindicated rather than disproved his doctrines.[92] His idea is that those who hope to make democracy the basis of the future social order must have a sure grip on the leading geographical and economic realities of history and of social and political processes,[93] and he expands the notion set forth in his discussion of the pivotal area in European history, calling this pivotal area the "Heartland of the Continent." He finds a second heartland in central Africa, and the remainder of the Eastern Hemisphere is confined to the coast lands of Europe and India. These coast lands are the seats of the great historic civilizations, and here in one-fifth of the land area of the world dwell four-fifths of the population. These centres of civilization have certain general resemblances, namely, navigable rivers running into the ocean, great fertility, and natural facilities for both manufacturing and commerce. The heartlands, on the contrary, are adapted chiefly to pastoral pursuits and nomadic life.[94]

[90] Loc. cit. pp. 136–143. See also M. Parmelee, *Blockade and Sea Power*, New York, 1924. The author endeavors "to expound the significance of sea power for world politics."

[91] London, 1919.

[92] Op. cit. preface.

[93] Ibid. pp. 36–37.

[94] Ibid. pp. 96 ff.

Discussing the history of Eurasia in its relation to the great heartland of the continent, Mackinder holds that the medieval monks were not far wrong in representing Jerusalem as the centre of the world, as it was natural that history should begin in this region which was a key position on the main road from the northern to the southern heartlands. The greater part of ancient history is concerned with the conquest of these agricultural and commercial peoples of the fertile belt of the Nile, the Euphrates and Syria by the more mobile nomads of the heartlands.

Invasions of this type have an important bearing also on later Eurasiatic history, e. g. the invasions of the Huns, the Saracens and the Turks. It would be difficult to overestimate the significance of these heartlands in history. Any power possessing the northern heartland and the Mesopotamian district could take the Suez and be in command of the Old World. This is the way in which land-power is challenging sea-power and was the chief danger in the German Drang nach Osten plan. Owing to the development of modern fortifications and big guns the Black Sea and the Baltic may now be regarded as a part of the northern heartland.[95] The great rivalry of empires in modern times has turned on this pivotal region of the Balkans and Mesopotamia. It has been a struggle between eastern and western Europe with Germany the crucial strategic central ground.[96] The Germans attempted to dominate the southern and central Slavs and thus control the heartland, and the Franco-Russian alliance was a counterpoise to this. English sea power and diplomacy

[95] Ibid. pp. 114–139.
[96] Ibid. pp. 147 ff., 160.

have been attempting to get around to the rear of the heartland and check Russian expansion to the south and east.[97] Thus Mackinder presents a very suggestive and original survey of certain geographic foundations of world-history and modern international problems.

One of the more interesting of recent English contributions to descriptive and historical anthropogeography is the work of James Fairgrieve, entitled *Geography and World Power.*[98] The book is a brief and illuminating review of world history in its geographical setting:

> This book is written to show how the history of the world has been controlled by those conditions and phenomena which we class together under the title of Geography and to point out which are the really essential geographical facts by noting those which have most effectively controlled the history. In that sentence there are three words about whose meaning we must be quite clear. They are "History," "controlled," "Geography."[99]

As to the meaning of history Fairgrieve contends that it is not merely a record of events, even of the more important ones, nor a summary of their causes and effects, but "an orderly relation of events which show the processes whereby man has gradually come to be able to use more and more energy, together with a statement of the causes and results of these events." Or again, "it may be said that in its widest sense on its material side history is the story of man's increasing ability to control energy."[100]

By geographical control Fairgrieve does not mean

[97] Mackinder, op. cit. pp. 161 ff. The importance of strategic position is emphasized also by Mahan. Op. cit. pp. 29–35.

[98] London, 1915. New edition, 1921.

[99] Ibid. p. 1.

[100] Ibid. pp. 4–6.

absolute geographical determinism, but rather the conditioning influence of geographic factors. "When we say 'history is controlled by geography,' we do not say that man is compelled by geography to use more and more energy, but that the precise way in which he has come to do this is largely controlled by geography." [101] The two chief types of geographical controls are *place* and *potential energy*. By place he means the location of the habitat of a given people with respect to its geographical surroundings and its relation to other localities. The latter aspect has become especially important in modern history. As to energy and its human utilization, this is chiefly the human appropriation of the energy of the sun. Hence arises the importance of studying the distribution of solar energy on the earth.[102] He then proceeds to survey the course of human history on the basis of these introductory generalizations, but space does not allow us to follow him into the descriptive and analytical details of his work.

Huntington emphasizes the influence of *place* upon human progress in his most recent book, [103] which he styles "an attempt to investigate the inter-relations between migration, racial mixture, and natural selection." [104] He believes that racial traits are attributable primarily to environmental influences and adjustments rather than to inherent biological differences, and much of the work is devoted to descriptions of the process of selection as evidenced in the history of two widely differing peoples—the Chinese and the Icelanders. In China it has been

[101] Ibid. p. 8.
[102] Ibid. pp. 10 ff.
[103] *The Character of Races*, New York, 1924.
[104] p. ix.

the terrible famines in the north which have caused the more aggressive and energetic among the inhabitants to migrate and settle in the south, while the less aggressive types remained in the old environment. In these famines and the resulting migrations, Huntington finds an explanation for the alert and progressive people in the south, and for the dullness and conservatism so characteristic of those in the north.[105]

In Iceland natural selection has operated through the rigors and hazards of the environment. The very migration in small boats from the Scandinavian peninsula through six hundred miles of stormy seas would presumably exclude all but the hardiest and most courageous of souls, thus insuring a selected group at the outset. During the thousand years which have intervened since the original migration, the selective process has continued through an exceedingly high death rate among the young men. Great numbers are drowned each year, and many more fall over cliffs or stumble into the bogs and pits in which the country abounds. Thus many of the potential fathers of the next generation are killed off, and, in Huntington's opinion, this number includes, for the most part, the careless, the weak, and the slow-witted, leaving the more cautious, alert and resourceful individuals to beget the generation which follows. This selection, he holds, combined with an unusually stimulating climate, accounts for the remarkable culture which has prevailed in Iceland for centuries.[106]

[105] Huntington, op. cit. pp. 184–204.
[106] Ibid. pp. 286–300.

Huntington's interpretations are open to some objections. No doubt certain human qualities like thrift and conservatism are enhanced by experiences such as the Chinese have been forced to undergo, but there is much evidence, also, that social inheritance carries over the same sort of thing for thousands of years, while peoples like the Japanese, touched by new ideas, free themselves from conservatism and lethargy and wipe out much of the old culture in two generations. Moreover, he relies to a considerable extent upon both secondary and literary sources, and upon reports and personal opinions of missionaries and travelers. On the other hand, he does not pretend that his latest book and its companion, *Civilization and Climate,* afford an adequate explanation of historical processes, and he points out, more clearly than he has heretofore done, that a complete explanation would require books on many other factors in social causation, including location, natural resources, inventions, ideas, economic forces, war and human ambition.[107]

[107] Ibid. p. ix.

CHAPTER VIII

DIRECT PSYCHOLOGICAL INFLUENCE FROM THE NATURAL SURROUNDINGS

THE present chapter deals with theories which imply a direct effect of natural phenomena upon the human mind, and these phenomena include beautiful scenery, lofty mountains, storms and the sound of thunder, the wildness of forest and stream, and the solitude of the desert. Indirect effects are not included. Thus lofty mountains may produce cultural stagnation by isolating a people, and storms may influence mental processes indirectly through their effect upon human energy, but in such cases these phenomena would not be considered *aspects of nature.* The effects discussed here are those which have been held to follow directly from man's contemplation of his natural surroundings.

Europeans are braver and more vigorous than Asiatics, according to Hippocrates, because of the general character of their climate and topography. Moreover, his use of both of these terms is broad enough to include phenomena which Humboldt and Buckle would call *aspects of nature.* To develop alertness and bravery environmental conditions are required which excite the mind, ruffle the temper, and arouse opposition. Such conditions are found in Europe, and it is to the storms and disturbances of rapidly changing seasons, therefore, as well as to the greater rugged-

ness of his topography that the European is indebted for his superiority.[1]

Plato's writings evidence a profound belief in the influence of natural phenomena upon the human mind. He held that some places "beget better men and others worse," and that some "are subject to strange and fatal influences by reason of diverse winds and violent heats, and some by reason of waters." And finally, "in all such qualities those spots excel in which there is a divine inspiration, and in which the gods have their appointed lots and are propitious, not adverse, to the settlers in them."[2] His theories are not easily assailed since he does not go into detail and lays down only broad general principles.

In building the ideal city, Aquinas would have a beautiful landscape to stimulate the æsthetic side of man's nature. It is the duty of the state, he held, to see to it that its people have the benefit of the refining effects of beauty. Houses should be built apart so that "refreshing bits of landscape may lie between." Trees are for "delighting and not merely for burning."[3] Beautiful surroundings would make a man contented and proud of his country. The city should be situated in a broad plain, with fruit trees, forests and fine rivers close at hand and with mountain scenery in the distance. But the love of beauty must not be allowed to supersede the love of virtue, for too much attention to beauty allows the sentiments to run wild and reacts against the exercise of good judgment. There should be just enough and not too much scenery therefore,

[1] Hippocrates, op. cit. Vol. I, pp. 158 ff.
[2] Laws, Bk. V. sec. 747, trans. by Jowett.
[3] Edward F. Murphy, *St. Thomas' Political Doctrine and Democracy*, pp. 156–7.

lest it stimulate men into "unrestrained pleasure," for excessive pleasure is corrupting to body and soul.[4]

Vico's observations are worth printing as a curiosity if for no other reason.[5] He attempted to harmonize a scientific view of history with the notion of a special creation and the unique mission of the Hebrews. He felt impelled to account for the origin of the primitive and classical peoples and the legends regarding giants, as well as for certain historic occurrences and institutions. He regarded the giants as the ancestors of the gentile races, and held that they attained their gigantic size as a direct effect of their environment and mode of life, which was brutal and filthy. These giants were the descendants of those who after the deluge fell away from the true religion of the Hebrews.[6]

Society, morality, religion and social institutions arose among these giants as the result of fear which they felt for the general aspects of nature, particularly for the noise of thunder and storms, which they interpreted as the voice of God trying to speak to them. From this fear there arose a sense of shame, the institution of family life, higher moral standards, and settled society until, in time, as a result of this reformed mode of living they shrank back to their normal size and became the gentile nations of the earliest historic period. Vico thus explains the origin of society, morality and religion through the indirect influence of thunder, lightning and storms; thus began the

[4] Aquinas, op. cit. chap. iv. H. O. Taylor, op. cit.

[5] Gian Battista Vico (1668–1744), a famous Italian philosopher and historian.

[6] Vico, *La Science nouvelle*, translated by Cristina Trivulzi, Paris, 1844, pp. 97–8. Cf. Croce, *The Philosophy of Vico*, p. 147; R. Flint, *Vico*, pp. 201–2.

"Age of the Gods."[7] Toward the close of his work he makes a few suggestive comments on the relation between the nature of a country and its government which faintly anticipate the ideas of Montesquieu.[8]

The wild and solitary, as well as the active, moving aspects of nature are, in Herder's opinion, important factors in the development of the imagination, and he makes much of the fact that great religious teachers have grown up in solitary desert regions. "From the remotest times the deserts of Arabia have fostered sublime conceptions, and they who have cherished them have been for the most part solitary, romantic men."[9]

The above quotation and the ones which follow show the great importance Herder attached to the influence of the *aspects of nature* upon the minds of men. He held that "the mythology of every people is an expression of the particular mode in which they view nature." Thus, "the gods[10] bathe in seas of milk and honey; his goddesses repose on cooling lakes, in the cups of fragrant flowers."[11]

No writer has been more profoundly moved by the contemplation of nature than Humboldt, whose pages teem with descriptions of natural phenomena and their effect upon the mind of the observer. "Mere communion with nature," he says, "mere contact with the free air, exercise a soothing yet strengthening influence on the wearied

[7] "In the course of the age the system of the greater deities was gradually established and the Giants, by means of their religion of terror and domestic education, taming the flesh and developing the spiritual element in them, and by the practice of washing shrank to the normal size of the men whom we find at the beginning of the next or heroic age." Croce, op. cit. p. 147.

[8] Vico, op. cit. pp. 387–90.

[9] Herder, op. cit. p. 356.

[10] i. e. of the Hindoo.

[11] Op. cit. p. 358.

spirit, calm the storm of passion, and soften the heart when shaken by sorrow to its inmost depths."[12] Mountain scenery, desert wastes, and bountiful harvests all have their effect upon the mind of the beholder and awaken in him "earnest and solemn thoughts." He waxes fairly poetical over the "calm sublimity of the tropical night," and is stirred to the depths of his soul by the grandeur of the Himalayas.[13]

In spite of his enthusiasm over the aspects of nature, however, Humboldt does not credit them with any tangible or lasting influence upon the mind of primitive man. He sees more than the landscape and its direct effects, and makes allowance for the type of mind which reacts to the landscape. The actual effect of the *aspects of nature* is therefore not easily ascertained, because this effect "depends so materially upon the mutual relation of the ideas and sentiments simultaneously excited in the mind of the observer."[14] He finds also that we often "receive from the external world that with which we have ourselves invested it."[15] One would naturally suppose, he says, that the inhabitants of warm regions, constantly beholding the wonders of a tropical environment, would take advantage of their opportunity to study and understand nature's laws. But they evidently do not do so, and we must go to northern latitudes to find those who do. It was the people of the temperate zone, who, despite obstacles of various kinds, discovered the laws of the physical world and carried

[12] Humboldt, op. cit. p. 3.
[13] Ibid.
[14] Ibid. p. 6.
[15] Ibid. p. 5.

civilization to the tropics.[16] In his notion that obstacles tend to bring out the best that is in man, Humboldt's theory is not unlike that of Hippocrates.

According to Ritter, the general aspects of the environment impress themselves upon a people to such a degree that they are restless when transferred to another locality, and he includes here not only the products of the earth, but also what Buckle calls the *aspects of nature*.[17] The appearance of the heavenly bodies, also, has made a deep impression upon human character everywhere and for all time.[18] "Thus," says Ritter, "whether it be from the contemplation of the forms on the surface of the globe, or the spheres which float through the sky, the influence of nature becomes one of the prominent sources of the individuality of national character, and men take, therefore, from their surroundings a stamp, the peculiarity of which is dependent upon the locality where they live."[19] The Arab derives not only food from his environment—he indulges in dreams of fancy which are a direct effect of the desert and cloudless sky. The Hindoo, living amidst luxuriant flowers and trees, derives from them his fantastic

[16] Ibid. p. 15.

[17] Gage, op. cit. pp. 285–6.

The following passage illustrates the mystical element in Ritter's environmental theory: "Nor is it alone of the narrow vale or the mountain range, of one people or of one state, but it is everywhere, on plains and high lands, among all peoples and in all states, that external agencies condition history, from primitive eras up to the latest times. They all exist under the influence of nature; and although the fact may not always appear, yet it is just as certain that nations are formed under this influence, and that it has everywhere and at all times penetrated to the very heart of history, as it is that God, although unknown to the ancients, yet was always and everywhere present." Ibid. p. 60.

[18] Ibid. pp. 286–7.

[19] Ibid. p. 287.

mythology. "The aspects of beauty and of terror which daily confront him, in time make him their subject." [20]

The influence of external conditions is so great (and we include not alone the mere productions of the earth and its developed resources, but also what may be summed up, as an eminent English writer has done, in the expression *aspects of nature*), that when men are rudely torn away from the scenes of their childhood, and have lost the old associations, whether of mountains or plains, whether of wood or prairie, of island or seacoast, they experience a restless longing for the old home, which seems to agitate every fibre of the heart, and which is satisfied only by returning to the old scenes once more. Psychology thus has this question to answer: whether this secret longing of the soul for the old haunts may not accompany man even to the highest stages of civilization, and prompt him to revisit the home of his ancestors. Many instances of this desire to return to the old family estate, or in the case of colonists to revisit the parent country, may be found, and they all seem to find their explanation in this longing to be again among the scenes and associations which were formative in moulding family characteristics and national traits.[21]

Peschel opposes the views expressed by Humboldt and Buckle on the influence of the *aspects of nature*. He also denies Buckle's contention that the nature of the food of a population has any perceptible effect upon the temperament of a people or upon local religious creations. He cites examples from various parts of the world in support of his position and points out many exceptions to Buckle's theory.[22]

When he defines his own position, however, Peschel's

[20] Gage, op. cit. p. 287.
[21] Ibid. pp. 285–6.
[22] Peschel, op. cit. pp. 308–314.

disagreement with Humboldt and Buckle becomes much less marked. In explaining why the desert stimulates the development of monotheism, for example, he attributes it to the fact that "it does not expose the senses to all the attractive phantoms of forest scenery." The "attractive phantoms" evidently have an influence all their own, for further on he says "it may therefore be asserted that with the extermination of the forests, not only is the climate of a locality altered, but poetry and paganism have also been struck with the axe."[23] In another passage which Peschel quotes approvingly from his contemporary, Aloys Sprenger, he adds that "in the boundless plains, the imagination which guides the youth of men is filled with images quite different from those suggested by forest country. The thoughts thus acquired are rather noble than numerous; out of his own consciousness of power man evolves for himself a yet bolder personality—a personal God by whom he is guided in his wanderings."[24] From the foregoing passages it is evident that Peschel can hardly be classed among the opposition.

As we have pointed out above, Treitschke says that England has suffered from the lack of a national use of wine, which would in a measure take the place of beautiful scenery, which that country does not possess. Wine, he holds, would stimulate imagination and gaiety. These qualities are developed also by beautiful scenery, but the scenery must not be too majestic, as it may thus oppress rather than stimulate the mind. He says that mountain regions have scarcely ever fostered the highest culture, and

[23] Ibid. pp. 317–318.
[24] Ibid. p. 316.

points to Switzerland as an example of this. Mountains may produce good sportsmen and sturdy manhood, but never artistic qualities. To find these one must go to the piedmont countries, to Swabia and Franconia. "The soul is lost to poetry which does not feel its inspiration in Heidelberg or Bonn, where the mood of Nature is cheering and uplifting to man, without being too great for him." [25]

Taine attributed the great psychic differences between Germanic and Latin peoples to differences in their respective habitats and he gave prominent consideration to topography and scenery.[26] The Germans took up their abode "in cold and moist countries, in the depths of gloomy forests and swamps, or on the borders of a wild ocean, confined to melancholic or rude sensations, inclined to drunkenness and gross feeding, leading a militant and carnivorous life." The Latin peoples, on the other hand, "living amidst the finest scenery, alongside of a brilliant, sparkling sea inviting navigation and commerce, exempt from the grosser cravings of the stomach," were given over to voluptuousness and a love of beauty.[27]

[25] Treitschke, op. cit. p. 223.

[26] Hippolyte Adolphe Taine (1828–1893), French historian and literary critic.

[27] H. A. Taine, *History of English Literature*, New York, 1900. World's Greatest Literature Series, Vol. I, pp. 14–16.

As his most important theoretical contribution Taine formulated the doctrine that there are three factors which create the "moral state" which operates to shape national genius and cultural traits. These, he holds, are race, environment and epoch, the third being the result of the combined operation of the other two. (Ibid. p. 13.) Race and environment are relatively stable and definite in their action, but epoch introduces the accidental factor, because though race and environment may be the same in two different periods of national history, the result of their combined operation will be different if the circumstances under which they operate are changed. (Ibid. p. 16.) Taine included political and social conditions as well as climate, soil, and topography under his concept environment or "milieu," and his view of environmental influences was broadly conceived, moderate and all-inclusive.

The last of Buckle's four great physical agents affecting human progress is the "general aspect of nature." This he describes as those appearances in the external world which have stimulated the imagination of mankind or otherwise influenced their "habits of thought." As climate, soil, and food affect the accumulation and distribution of wealth, so, he maintains, the various aspects of nature affect the accumulation and distribution of thought.[28]

Insofar as they affect the accumulation and distribution of thought, Buckle divides the aspects of nature into two classes: (1) those most likely to stimulate the imagination, and (2) those which affect the understanding. Advancing civilization, he holds, tends constantly to develop the reasoning powers and to curb the imagination, which, although more under control now than in primitive times, still, in his opinion, has far too much power.

Among the various phenomena included under the aspects of nature, Buckle enumerates beautiful scenery, mountain ranges, earthquakes, volcanic eruptions, tempests, hurricanes, and even pestilences. His idea of the influence of these phenomena upon human thought is expressed in the following passage:—

> Now, so far as the natural phenomena are concerned, it is evident, that whatever inspires feelings of terror, or of great wonder, and whatever excites in the mind an idea of the vague and in-

[28] Op. cit. p. 85.

Exception may be taken to this, for granting that the aspects of nature do furnish much of the substance of primitive poetic, animistic, and religious ideas, still the most important primitive traditions concerning economic, juristic, and political ideas grew out of the struggle to adjust property rights and would be ultimately determined by climate, soil, and food, the agents which condition the accumulation and distribution of wealth.

controllable, has a special tendency to inflame the imagination, and bring under its dominion the slower and more deliberate operations of the understanding. In such cases, Man contrasting himself with the force and majesty of Nature, becomes painfully conscious of his own insignificance. A sense of inferiority steals over him. From every quarter innumerable obstacles hem him in, and limit his individual will. His mind, appalled by the indefined and indefinable, hardly cares to scrutinize the details of which such grandeur consists. On the other hand, where the works of Nature are small and feeble, Man regains confidence: he seems more able to rely on his own power; he can, as it were, pass through, and exercise authority in every direction. And as the phenomena are more accessible, it becomes easier for him to experiment on them, or to observe them with minuteness; an inquisitive and analytic spirit is encouraged, and he is tempted to generalize the appearances of Nature, and to refer them to the laws by which they are governed.[29]

To illustrate his theory of the differential effects of sublime and ordinary environments, Buckle contrasts the civilization of India, where the works of nature are of "startling magnitude," with that of Greece, where they are smaller, feebler, and "less threatening to man." To the awful blood sacrifices and hideous orgies of the Indian religion, he opposes the beautiful anthropomorphic conception of the Greeks, where the gods were close to man. In their conception of man, there is, likewise, a contrast. In India man is abased and the individual submerged; in Greece, everything tended toward the elevation of man and the growth of individualism. In their habits of thought the natives of India are extremely imaginative and poetical; the Greeks, on the other hand, were critical, and in

[29] Buckle, op. cit. pp. 86–87.

Aristotle furnished one of the greatest thinkers of all time.[30] In general, he held that in Asiatic and other civilizations outside of Europe the aspects of nature tended to develop the imagination, and that in European civilizations the relative lack of sublimities in the environment tended on the whole to curb the imagination and develop that critical, scientific spirit upon which all progress must depend.[31]

It was Buckle's aim to introduce into the study of history the exactness and certainty of the natural sciences, and this aim reflects his strong reaction against the metaphysics and the narrow political history of his day. Whatever one may think of his achievement, few will deny the lofty object of his work, which was to discover the relative importance of the mental and physical laws governing social evolution and to trace the workings of these laws in the development of civilization.[32]

The writers discussed in this chapter appear to have been influenced by what has been called "the psychology of the tourist" which they have introduced into their interpretation of the effects of the *aspects of nature* upon the permanent population. This state of mind is well understood by one who has lived in a region of lofty mountains, or for that matter in a metropolis of lofty buildings. The tourist is stirred to the depths of his soul by the glorious works of nature, and the tiller of the soil by the

[30] Ibid. pp. 95–106.

[31] Ibid. pp. 93–94.

[32] In his *Cities in Evolution* (1915), Patrick Geddes, the British sociologist and civic reformer, presents an interesting plan for the practical application of environmental theory. His city environment, both in its natural aspects and in its general plan, must be one which will stimulate the æsthetic senses as well as fulfill the other requirements of the ideal municipality.

glorious works of man. In general, however, the local population seems inclined to regard even the most striking scenery as an everyday commonplace, and is by no means so impressed by it as the traveller upon his first visit to the locality.

CHAPTER IX

THE GEOGRAPHICAL MARCH OF HISTORY

"HISTORY and geography," says Turgot, "place men in their different distances. The one expresses the distance of space, the other of time."[1] Many writers, ancient and modern, from Polybius the Greek historian to Karl Ritter, have sensed this intimate relationship between geography and history. Strabo's attempts to establish such a relationship placed him in the front rank among ancient geographers,[2] and Ritter's works are permeated with the idea. To Guyot, however, belongs the credit of first stating in a comprehensive manner the fact of a progressive, orderly shifting of civilizations. This could hardly be better stated than in his own words:

> The first glance we cast upon the annals of the nations, enables us to perceive a singular but incontestable fact, that the civilizations representing the highest degree of culture ever attained by man, at the different periods of his history, do not succeed each other in the same places, but pass from one country to another; following a certain order. This order may be called *the geographical march of history.*[3]

[1] *The Life and Writings of Turgot*, W. W. Stephens, London, 1895, p. 311.

[2] "Among these various departments of geographical study the one which predominates in Strabo's work is undoubtedly the historical. Not only does he everywhere introduce the history of a country side by side with its geography, but he illustrates the one by the other, and endeavors to point out the intimate connexion that existed between the two." (H. F. Tozer, *History of Ancient Geography*, Cambridge University Press, 1897, p. 246.)

[3] Guyot, *Earth and Man*, p. 300.

In another part of his work Guyot further elaborates this conception as follows:—

The geographical march of history must have convinced us, if I am not mistaken,—

1. That the three continents of the North are organized for the development of man, and that we may rightfully name them pre-eminently the historical continents.

2. That each of these three continents, by virtue of its very structure, and of its physical qualities, has a special function in the education of mankind, and corresponds to one of the periods of his development.

3. That in proportion as this development advances and civilization is perfected, and gains in intensity, the physical domain it occupies gains in extent and the number of cultivated nations increases.

4. That the entire physical creation corresponds to the moral creation and is only to be explained by it.[4]

In his detailed analysis of the *geographical march of history* Guyot describes the origin of civilization in the ancient Orient of Egypt, Babylonia and Persia. "There all science appears as traditional. Man attains not to the light by his own activity. The truth is not the recompense of his efforts, of his progress, of the free unfolding of his faculties. It is transmitted to him already prepared from elsewhere." The same is true in social life with its insurmountable barriers, restraining "the free movement of the human faculties," and in political life with its "irrevocable decrees."[5] The cultural focus then shifts to Greece "where all the varied contrasts of the whole con-

[4] Guyot, op. cit. p. 329.
[5] Ibid. p. 305.

tinent seem to be repeated in a narrow space, under a climate blessed of Heaven, a new people arise, upon a new land, a free people, a people of brethren. With them the period of youth commences; human consciousness awakes with energy; man recovers himself; the slave bent beneath the yoke (of nature) springs up and holds his head erect. The Greek, with his festivals, his songs, his poetry, seems to celebrate, in a perpetual hymn, the liberation of man from the mighty fetters of nature."[6] Greece is succeeded by Rome which, "more skilled in the arts of conquest, and of establishing solid and durable ties between the nations, combines in one and the same social net-work all the civilized nations of the Ancient World. The place she occupies in the very middle of the basin of the Mediterranean, seems to foretell that she is destined to become the metropolis of all the cultivated people who dwell upon its shores."[7]

Civilization then moves on to northern Europe beyond the Alps, "where it establishes its centre."[8] Finally the Atlantic is crossed and America seems destined to be the centre of the highest civilization of the future.[9] This shifting of the centre of civilization Guyot has himself summarized thus:

> The man of the Old World sets out upon his way. Leaving the highlands of Asia, he descends from station to station towards Europe. Each of his steps is marked by a new civilization superior to the preceding, by a greater power of development. Arrived at the Atlantic, he pauses on the shore of this unknown ocean, the

[6] Ibid. p. 306.
[7] Ibid. p. 309.
[8] Ibid. p. 312.
[9] Ibid. pp. 321 ff.

bounds of which he knows not, and turns upon his footprints for an instant. Under the influence of the soil of Europe, so richly organized, he works out slowly the numerous germs wherewith he is endowed. After this long and teeming repose, his faculties are reawakened, he is reanimated. At the close of the fifteenth century, an unaccustomed movement agitates and vexes him from one end of the continent to the other. He has tilled the impoverished soil, and yet the number of his offspring increases. He turns his looks at once towards the east and the west, and sets out in search of new countries. His horizon enlarges; his activity preys upon him; he breaks his bounds. . . . He abandons himself to the winds and the currents, which bear him gently towards the coasts of America. He is enraptured as he treads the shore of this land of wonders, still more adorned in his eyes by all the fascinations his ardent imagination lends it.[10]

It is obvious that this famous theory of Guyot regarding the geographical march of history, while hinted at by Ritter, is closely related to the teleology and the mysticism of the whole Romantic movement in philosophy and history, represented in Germany by Fichte, Hegel, and their followers, in France by Chateaubriand, Thierry, Michelet, Barante, and Victor Hugo, and in England by Burke, Carlyle and Froude. It is especially dependent upon the Hegelian philosophy of history which traces the development of the *Weltgeist* in much the same way as Guyot traces the geographical march of history. In fact, Guyot's theory may be said to be in harmony with the Hegelian theory of the migration of the *Weltgeist,* though of course Hegel himself would admit little interrelationship between environment and history. It is to be observed, however, that Guyot did little more than to set down certain obvious

[10] Guyot, op. cit. pp. 233–234.

facts regarding the shifting of the centre of civilization northwestward. He brought forward very little to explain this process beyond some teleological mysticism regarding a purposive development of human culture.

There is obvious similarity also between Guyot's notion of a progressive shifting of civilizations and Lester F. Ward's theory of *sympodial development* as applied to the evolution of human society.[11] Civilizations spread, says Ward, using the botanical analogy, not through *monopodial* branching, like a tree, but by *sympodial* growth, in which the new branch supersedes the main trunk whose subsequent growth is arrested if it does not disappear altogether. The development of this social *sympode* is due to a more complete adaptation to new conditions imposed by a changing environment, and the decadence of the parent civilization to a corresponding lack of adaptation. Indirectly, therefore, the notion of *sympodial* development in human society has geographic implications, though in his discussion of the process Ward does not stress the element of environmental influence. The following passage from his *Pure Sociology* is suggestive of Guyot's treatment:

> Races and peoples are always giving off their most highly vitalized elements and being transplanted to new soil, leaving the parent country to decline or be swallowed up. The plot of the "Æneid," though it be a myth, at least illustrates this truth. Troy was swallowed up by Greece, but not until it had been transplanted to Rome, and the *Pergama recidiva* handed on the qualities of Trojan character to later ages. Italy was the vanguard of civilization to the sixteenth century, when she transferred

[11] L. F. Ward, *Pure Sociology*, pp. 71–79.

her scepter to Spain, which held it during the seventeenth, and in turn transferred it to France. It passed to England in the nineteenth, and bids fair to cross the Atlantic before the close of the twentieth. Race and national degeneration or decadence means nothing more than this pushing out of the vigorous branches or sympodes at the expense of the parent trunks. The organicists see in colonization the phenomenon of social reproduction. This is at least a half truth. Colonization often means regeneration; it means race development; it means social evolution.[12]

Attention has already been called to Spencer's theory that the earliest civilizations had their origin in the tropics, and as man advanced in the arts and in methods of co-operation it became possible for civilization to move into regions where the obstacles to be overcome were greater. Thus the *geographical march of history* was to Spencer a steady progression from the warmer and more productive habitats demanded by the feebler stages of social evolution to the colder, less productive, and more difficult regions away from the tropics.

I do not ignore the fact that in recent times societies have evolved most, both in size and complexity, in temperate regions. I simply join with this the fact that the first considerable societies arose, and the primary stages of social development were reached, in hot climates. The truth would seem to be that the earlier phases of progress had to be passed through where the resistance offered by inorganic conditions were least; and when the arts of life had been advanced, it became possible for societies to develop in regions where the resistance was greater; and that further developments in the arts of life, with the further discipline in coöperation accompanying them, enabled subsequent societies to take root and

[12] Ward, op. cit. p. 79.

grow in regions which, by climatic and other conditions, offered relatively—great resistances.[13]

Metchnikoff's general theory is a good illustration of the use of history and geography to vindicate the political doctrines of philosophical anarchism. After setting forth the thesis that coöperation is the first principle in the evolution of organic life and social institutions he endeavors to show that civilizations themselves have developed in historic sequence from a mechanical and repressive type to a flexible and coöperative form. He insists that the development of coöperative activity is the fundamental element in biological, social and historical evolution. Its growth is the universal measure of progress.[14] In biological evolution the bond of association progresses from a crude mechanical type, through a physiological stage of differentiation, to a final voluntary or psychological plane.[15] In the evolution of social groups there is illustrated the same sequence. The first groups are based upon external and mechanical coercion; these are supplanted by

[13] Spencer, op. cit. pp. 19–20.

Says Benjamin Kidd: "The human race reached its earliest development where the conditions of life were easiest; namely, in the tropics. But throughout the whole period of human history, the development of the race has taken place outwards from the tropics. Slowly but surely we see the seat of empire and authority moving like the advancing tide northward." Op. cit. pp.51–52.

This view was anticipated by Charles Comte early in the nineteenth century: "When we watch the course of civilisation on each of the chief divisions of the earth, we see enlightenment at first acquired in warm climates; then expand into temperate climates; and at length stop at, or hardly penetrate into, cold climates." Quoted in Robert Flint, *History of the Philosophy of History in France, French Belgium and Switzerland*, New York, 1894, p. 578.

[14] Metchnikoff, op. cit. pp. 15, 26–27, 34–35, 159.

[15] Ibid. pp. 26–27.

groups, still lacking in freedom, but founded upon that differentiation which grows out of a more highly specialized division of labor; finally come those well coördinated groupings which are based on personal choice and a conscious community of interests.[16] In the historical development of civilizations there is to be observed this same sequence in the evolution of the coöperative principle. Civilization begins in the great river basins of antiquity—Egypt, Babylonia, Assyria, India and China—where association and coöperation were mechanical and political life was despotic. Next comes the Mediterranean stage in which the sea-going Phœnicians began that commercial activity which was carried on by Greeks, Romans and Italians, and which made possible for the first time an extensive differentiation of national economies. The final stage in the progress of civilization is the Oceanic. Beginning with the Atlantic period, at the dawn of the age of discoveries, it has recently developed into the universal epoch with the expansion of European civilization throughout the world.[17]

Thus Metchnikoff finds three great types of historic environments which have succeeded each other in the different stages of civilization: the fluvial, the thalassic and the oceanic. The significant types of environment, then, like the typical stages of culture, vary with the progress of history:—

> Thus this migration of civilization from one place to another in different epochs of history which is so capricious in appearance,

[16] Metchnikoff, op. cit. p. 35.
[17] Ibid. pp. 51-52, 157-159.

this historic significance of different geographical environments, so variable in the course of centuries, in reality presents a perfect order and remarkable regularity. The geographic setting of civilization itself evolves with the passage of time: at first limited to the more or less restrained region of certain unusually important river basins—our great historic rivers—it enlarges itself at a given moment to become Mediterranean, then Oceanic, or rather Atlantic, before becoming universalized, so as to include every habitable district of the world.[18]

The discussion of the influence of rivers and river basins upon the development of civilization is limited by Metchnikoff to an analysis of the fluvial civilizations of antiquity, which constitute the distinctive fluvial cultures.[19] While the great ancient civilizations of Egypt, Babylonia, India and China rose and developed in river basins, there was enough difference in the specific characteristics of each basin to account for the lack of synchronism between the period of their highest development and the duration of their civilization. The relative backwardness of China and India and the arrested nature of their civilizations are easily explainable in the light of their environmental setting. Instead of leading these civilizations towards the Mediterranean or the centre of the next stage of civilization, their rivers pointed in the opposite direction and tended to isolate them rather than to draw them into the current of progressive civilization. For this reason China and India, shut off from the current of developing European civilization, remained archaic and stationary until the Occidental civilization was brought to them after the era of

[18] Ibid. pp. 155–156.
[19] Ibid. pp. 190–366.

ocean navigation had originated.[20] By the conditions and limitations of their geographical environment these river basin civilizations of antiquity were all condemned to a condition of mechanical solidarity, coercive coöperation and political despotism. In other words, they were limited to the first stage of social evolution and the first type of historical civilization. Not until the development of the Mediterranean period could that differentiation arise from a division of labor which had to precede the development of political liberalism and voluntary coöperation.[21] Metchnikoff also attacks Buckle's belief that the difference between the civilizations of Asia and Europe was due to the fact that Asia owes its historic rôle to the soil while that of Europe was due to its climate. He holds that the differences between these civilizations arose from the fact that Asia belongs to the great fluvial despotisms of antiquity—the first phase of historic development—while European civilization is a product of the second or Mediterranean stage of civilization.[22]

Demolins finds that the primary and decisive cause of

[20] Metchnikoff, op. cit. pp. 173, 319, also chapters x-xi. It will be evident that Metchnikoff's notion of the fundamental reasons for the backwardness of the culture of China and India is opposed to the notions of Montesquieu and Buckle and resembles the view of Ratzel.

[21] Ibid. pp. 161, 353–354, 364–365.

[22] Ibid. p. 184. See also Marion I. Newbigin, *The Mediterranean Lands*, New York, 1924. This book discusses, among other things, the rise of civilization in the regions of the Nile, Tigris and Euphrates, the decline of this fluvial civilization and the rise of the thalassic, which in turn was followed by the oceanic. The thalassic period extended from the beginning of the Cretan civilization to the discoveries of the fifteenth and sixteenth centuries (A. D.), which ushered in the Commercial Revolution and the oceanic stage of world history. In tracing man's progress from the narrow and limited resources of the fluvial and thalassic cultures into the broader oceanic, Miss Newbigin has made an important contribution to the doctrine of the "geographical march of history."

the diversity of races and peoples is the route which the people have followed.[23] The route creates the race and the social type.[24] By route he means not merely the regions passed through by a people, but the localities in which they have settled.[25] He thus makes "la route" practically identical with the whole physical environment.

These routes, Demolins holds, are powerful refineries, which in one way or another transform the peoples who make use of them.[26] They have tended to create definite social types, and even the racial type is changed by a transformation of the route.[27] If the history of humanity were to begin over again with the same biological factors and with the surface of the earth unchanged, history would be repeated in its larger outlines, for the same routes would create the same social and racial types.[28] Geography, from this point of view, determines the character and evolution of human societies, and history, as a dynamic geography, is the highest and most exact science—the guide of life.[29]

On the basis of this doctrine Demolins examined the steppe route which created the Tartar-Mongol type, the tundra route and the resultant Eskimo type, the forest

[23] Demolins' chief systematic work on anthropogeography is, *Les grandes routes des peuples, essai de géographie sociale; comment la route crée le type social*, 2 Vols. Vol. I. *Les routes de l'antiquite:* Vol. II, *Les routes du monde moderne.* See C. W. A. Veditz in the *Annals of the American Academy of Political and Social Science*, Vol. XVIII, 1901, pp. 525–7, for a review of Volume I, of Demolins' work. An English translation is now appearing.

[24] Op. cit. Vol. I, Preface, p. vii.

[25] Op. cit. Vol. II, Preface, p. v.

[26] Op. cit. Vol. I, Preface, p. vii.

[27] Ibid. pp. viii–ix.

[28] Ibid, p. ix.

[29] Ibid. p. x.

Demolins was a member of the school founded by Frederic Le Play (1806–1882), who is usually regarded as the originator of the social survey method of investigation. See below pp. 246–249.

route and the Indian and Negro types, and the routes which created the ancient empires and the Mediterranean civilizations.[30] He investigated also the routes which, he held, had transferred the centre of civilization from Asia to Europe—the routes of eastern, central and western Europe.[31] His theory that similar geographic conditions will always produce substantially the same racial and cultural types and characteristics stamps him as an extremist in the belief in the importance of the influence of the physical environment on society.[32]

Mackinder, whose general theory is discussed in the preceding chapter, distinguishes three chief historic eras. These are the ancient and medieval era when European civilization was largely confined to central and southern Europe and was continually attacked in the rear by the inhabitants of the steppe district; the Columbian era from 1500 to 1900 which was characterized chiefly by the expansion of European civilization over-seas with little effective native resistance; and the future which will be the era of permanently closed political systems intimately interconnected and interrelated, in other words, the era of the world-organism.[33] Man is now for the first time able to look upon world-history as a whole and to generalize about it.[34]

Huntington attributes the shifting of civilizations to actual changes in climate. In his *Pulse of Asia* he first

[30] Demolins, op. cit. Vol. I.

[31] Op. cit. Vol. 11.

[32] For a good brief analysis of the whole of Demolins' contributions to "social geography" see E. A. Ross, *Foundations of Sociology*, pp. 312–17.

[33] "The Geographical Pivot of History," published in the *Geographical Journal* for April 1904.

[34] Loc. cit.

points out the evidences of historic changes in the climate of the Plateau of Iran. There were incredibly numerous ruins of once flourishing cities in localities now arid. The route followed by Alexander the Great is now barely able to support a caravan of a few camels. It has often been claimed that the civilization of Persia decayed from war and misgovernment, but an examination of the facts proves, on the contrary, that those provinces have remained most prosperous in which there has been most war and misgovernment, while those that have declined are those that have suffered most from the definite historic decrease of their water supply.[35]

Interesting also is the discussion of the alleged fluctuation of the level of the Caspian Sea during historic times. Various ancient testimony of a reliable sort leads, he holds, to the hypothesis that "in the days of Herodotus and Alexander, over twenty-one hundred years ago, the Caspian Sea stood nearly a hundred and fifty feet higher than now, and almost coalesced with the Sea of Aral. Three or four centuries later, at the beginning of the Christian era, the water had apparently fallen to a level a hundred feet or less above that of to-day, the sea being still much larger than at present."[36] These changes of level, Huntington believes, can only be accounted for on the postulate of a change of climate. "Apparently," he says, "we must disregard the ancient authorities entirely or else admit a change of climate."[37] Since the beginning of the Christian era there have been some very interesting transformations

[35] Op. cit. pp. 315–328.
[36] Ibid. p. 337.
[37] Ibid. p. 339.

in the level of the Caspian Sea. About 500 A. D. it receded so that it was as low or lower than it is to-day. During the Middle Ages the Caspian Sea once more arose, but not to its former level. In 920 A. D. it is estimated to have been twenty-nine feet above the modern level and in 1306 it is computed that it was thirty-seven feet higher than at present. Since 1400 the level has greatly receded.[38] He concludes that while the changes in the course of the Oxus may have had some influence upon these changes of level, still it seems that the predominant cause was climatic oscillation.[39]

On the basis of his investigations of the changes of level in the Caspian Sea district Huntington makes the following generalizations. The curve of the changes of level of the Caspian Sea is practically identical with the curve of the changes of climate in that district. Moreover this climatic curve is applicable to the whole of Western and Central Asia; a vast area of sixteen hundred miles from north to south and three thousand miles from east to west has been subject to the same great waves of climatic change. Today he claims that this region is in a period of comparative equilibrium with no distinct trend toward climatic changes in either direction.[40]

Generalizing still further, Huntington develops the theory which he designates "the geographic basis of history," which consists of two chief factors. The first is the permanent factor, namely, the relief of the land, the distribution of water and the difference of the temperature as

[38] Huntington, op. cit. pp. 341–344.
[39] Ibid. pp. 350 ff.
[40] Ibid. pp. 350–358.

one passes from north to south. The second is the changeable element, namely, accidental occurences such as earthquakes and volcanic eruptions and, most important of all, those changes of climate which have caused corresponding transformations in the distribution, occupations, habits, and the character of man.[41]

There are four chief types of climatic changes according to Huntington. The first is that type of vast duration such as the glacial period. Next come the glacial epochs of ten thousand or more years. The third type is constituted by those historic changes of climate, such as were revealed to have taken place in Central Asia. Finally, there are the climatic pulsations of some thirty-five or thirty-six years in length.[42] Climatic changes, he holds, are of great historic significance and have been among the chief controlling causes of the rise and fall of the great world civilizations. He believes that the most significant aspect of the shifting of the centres of civilization has been their movement from the south toward the north rather than the traditional observation of their progress from east to west. Egypt and Babylonia reached the height of their civilization at about 30° north latitude. The latitude of Persia was not greatly different, but being at a higher altitude would naturally be somewhat colder. Syria, Greece and Carthage developed their civilizations at a latitude of 35° to 40° north. Rome was located at about 45° north latitude. France, Austria and Germany extend from 45° to 50° north latitude. In America the higher latitudes of the United States have produced the most advanced civiliza-

[41] Ibid. pp. 359–360.
[42] Ibid. pp. 365–373.

tion.[43] At this point Huntington makes a very significant attack upon the conventional notion that the earliest civilizations developed in a warm climate while the later ones have issued from a temperate zone. He contends that, on the basis of his theory of climatic changes, each of the successive centres of civilization had about the same climate at the time of the height of its culture, in other words, maintaining that the climate north of the equator is getting warmer. According to this view man has made the most rapid progress under essentially the same climatic conditions, which Huntington summarizes as follows:—

> The conditions apparently are that the summers shall have a sufficient degree of warmth and rainfall to make agriculture easy and profitable, but not enough to be enervating; that the winters shall be cool enough to be bracing, but not deadening; and that the relation of summer and winter shall be such that with foresight every man can support himself and his family in comfort the year around, while without foresight he and his will suffer severely. Comparatively clear, dry air and high barometric pressure appear to be subsidiary conditions favorable to human progress.[44]

In his *Civilization and Climate* Huntington again discusses the shifting of climatic zones and centres of civilization and contends that, in the first place, no nation has ever risen to the highest stage of civilization without a strong climatic stimulation, and, in the second place, that the shifting of the area of ideal climatic energy has corresponded with the shifting of the centres of civilization.[45]

[43] Huntington, op. cit. pp. 380 f.
[44] Ibid. p. 382.
[45] Op. cit. pp. 251 ff., 269–270.

His ideas on this subject are, in general, similar to those given above in discussing his *Pulse of Asia*. Only two new elements are introduced. The first is his doctrine of the influence of sun-spots as a factor in periodic climatic changes. When there are more sun-spots the sun sends out more heat, but the earth is cooler for there are more storms. Changes in sun-spots also mean a shifting of the storm belt. The cycles of sun-spots are of about one hundred years maximum and eleven years minimum duration. During the eleven year solar cycle when sun-spots are most numerous storms are most frequent.[46] The second new element brought out in this discussion is Huntington's attempt to prove the world-wide nature of pulsatory changes of climate. To do so, he prepared charts of changes of rain-fall and temperature from the geology of western Asia and the growth of the California big trees and found that they agreed and synchronized in the pulsatory changes of climate which they illustrated from 1500 B. C. to the present time.[47]

Although Robert DeC. Ward denies the suitability of a tropical climate for progressive intellectual development, he believes, along with Spencer, that primitive man in his earliest stages lived in the tropics, but achieved the beginnings of civilization in regions of less abundance:—

> There are reasons for thinking that primitive, prehistoric man, in his earliest stages, when most helpless, was an inhabitant of the tropics; that he lived under the mild, uniform, genial climate

[46] Ibid. pp. 245 ff., 271 ff. This solar hypothesis he has elaborated in two later books, *Climatic Changes: their nature and causes*, 1922; and *Earth and Sun*, 1923.

[47] Ibid. pp. 227 ff. See also his *Palestine and Its Transformation;* and *The Climatic Factor in Arid America*.

of that zone, where food was easily obtained and protection against the inclemencies of the weather least necessary. There has been a belief that southern Asia, bordering on the Indian Ocean, with its numerous bays, was probably the cradle of humanity.

Civilized man is believed by many to have appeared first on the delta formed at the head of the Persian Gulf by the Tigris and Euphrates rivers, where also wheat was very likely first grown. Ancient civilizations seem to have developed in the drier portions of the tropics, where irrigation was necessary in order to insure abundant and regular crops, and where lived races more energetic and more hardy than those of the damper and rainier portions of the tropics, with more luxuriant vegetation.

Civilization was thus probably first developed, not where the overwhelming superabundance of nature's gifts seems to offer the best conditions, but where man was under some stress of labor, some spur to effort, in less favorable natural conditions, but such as developed him.[48]

Ward finds that historically the centers of civilization in the north temperate zone have tended to move northward.[49] This is because man, when he had mastered the milder environments, was able to move into environments more and more difficult and which tended more and more to bring out the best that was in him. "Behind our civilization," says Ward, "there lies what has been well called a 'climatic discipline,'—the discipline of a cool season which shall refresh and stimulate, both physically and mentally, and prevent the deadening effect of continued heat."[50] It may be noted that Ward's theory in this regard is not unlike that of Spencer.

[48] R. D. Ward, op. cit. pp. 232–3.
[49] Ibid. pp. 274–5.
[50] Ibid. p. 274.

Ward discusses with acumen and moderation the much disputed point of climatic changes in the same region during historic times. He cites the general nature of the evidence, which includes the fluctuation of the level of lakes, the abandonment of village sites for lack of water, the existence of prosperous Neolithic settlements in the Sahara district, and the popular belief in climatic changes.[51] He points out that such scientific arguments as exist in support of the doctrine of climatic changes are given rather unusual credence because of the popularity of the notion that climates are continually changing. He asserts that the best scientific instruments reveal no evidence supporting the contention that climates are changing and that the popular notion that climate is changing possesses almost no validity in the light of even the most elementary facts of modern psychology. Human memory is extremely untrustworthy and general impressions are even more unreliable as an instrument for detecting climatic alterations. Social and economic factors, such as changes of residence, the improvement of land, inventions which allow mankind to control climatic conditions more readily, and economic transformations which change the demand for given products of the soil, all have their effect in producing popular ideas about climatic changes and cause a complete misconception of the actual facts in the case.[52] Other facts go far to disprove the hypothesis of climatic changes. Changes in crops have an economic as well as a climatic basis. The accounts of explorers regarding climatic trans-

[51] Ibid. pp. 338–341.
[52] Ibid. pp. 341–347.

formations are generally contradictory. The desiccation of a region is often due to the decreased energy and ability of the inhabitants. A few years of a wholly temporary drought may cause the abandonment of a locality.[53] Ward therefore concludes that "the body of facts which has been adduced as evidence of progressive changes of climate within historical times is not yet sufficiently large and complete to warrant any general correlation and study of these facts as a whole, especially from the point of view of possible causation."[54] He further holds that "it is apparent, on examining the evidence thus far at hand, that the fact of permanent, progressive changes in climate during historical times has not yet been definitely established."[55]

Professor Ward is about as skeptical regarding the theory of periodic oscillations of climate, which has been set forth at such lengh by Ellsworth Huntington and others, as he is regarding permanent climatic changes. He maintains that the eleven year cycle in relation to sun-spots and their influence upon climate and the weather has not been definitely proved. There is more evidence for Bruckner's thirty-five year cycle of climatic change, but not enough to warrant certainty in the prediction of its exact recurrence. Finally, no definite proof exists for the alleged longer periods of climatic oscillation with the exception of the glacial periods.[56] He gives the following summary of the whole question:—

[53] Ward, op. cit. pp. 346–351.
[54] Ibid. p. 346.
[55] Ibid. pp. 351–352.
[56] Ibid. pp. 353 ff.

There is a widespread popular belief in permanent, progressive changes of climate during a generation or two. This belief is not supported by the facts of meteorological record. Abundant evidence has been adduced in favor of secular changes of climate in historical times. Much of this is untrustworthy, contradictory, and has been interpreted without sufficient regard to possible controls other than climatic change. Without denying the possibility, or even the probability, of the establishment of the fact of secular changes, there is as yet no sufficient warrant for believing in considerable permanent changes over large areas. Dufour, after a thorough study of all available evidence, has concluded that a change of climate has not been proved. There are periodic oscillations of slight amount. An eleven year period has been made out, with more or less certainty, for some of the meteorological elements, but it has been of no practical importance as yet. A thirty-five year period is less uncertain, but it is nevertheless of considerable irregularity, and can not as yet be practically applied in forecasting. Longer periods are suggested, but not surely established. As to causes, variations in solar activity are naturally receiving attention, and the results thus far are promising. But climate is a great complex, and complete and satisfactory explanations of all the facts will be difficult, perhaps impossible, to reach. At present, indeed, the facts which call for explanation are still in most cases but poorly determined, and the processes at work are insufficiently understood. Climate is not absolutely a constant. The pendulum swings to the right, and to the left. And its swing is as far to the right as to the left. Each generation lives through a part of one, or two, or even three, oscillations. A snapshot view of these oscillations makes them seem permanent. As Supan has well said, it was formerly believed that climate changes locally, but progressively and permanently. It is now believed that oscillations of climate are limited in time, but occur over wide areas. Finally, it is clear that man, whether by reforestation or deforestation, by flooding a desert or by draining a swamp, can produce

no important or extended modifications of natural climate. This is governed by factors beyond human control.[57]

According to S. C. GilFillan, the march of civilization has been *coldward*.[58] Originating in hot countries such as Egypt and Sumeria, leadership passed to Babylonia, Crete, Phœnicia and Assyria—always tending northward and the mean temperatures of the successive capital cities moving steadily downward. This general northward and *coldward* movement has continued for five thousand years, passing through Greece and Rome to France, England, Germany and the United States, and GilFillan sees nothing to indicate that the process will halt during the twentieth century. He cites historical examples, also, to prove the converse of his theory, i. e. that when civilization has declined, leadership has retreated southward, and he reaches the following general conclusion:

> So with the scene of highest civilization moving coldward when civilization advances and southward when it disintegrates, the logical inference is that each grade of civilization has an appropriate temperature in which it will especially flourish.[59]

Several reasons are given to account for this *coldward* progression. As civilization advances and man's mastery over the forces of nature increases, warmth is not so important for agriculture. Colder temperatures are better

[57] Ward, op. cit. pp. 362–363. Cf. Julius Hann, op. cit. pp. 375–412. Hann is likewise skeptical on the question of progressive climatic changes in a given direction. His views on periodic variations of climate also resemble those of Ward.

[58] S. C. GilFillan. "The Coldward Course of Progress," in the *Political Science Quarterly*, 1920, Vol. XXXV, pp. 393–410.

[59] Loc. cit. p. 393.

for health. Cold, also, is conducive to stability, and GilFillan cites the conclusions of Dexter on this point. Citing Huntington, he argues that the greater day to day and season to season variations of temperature in cool climates are powerful stimulants to human effort. Moreover, the cooler climates, he holds, make for increased vigor, both physical and mental, and for comfort, since man is able to protect himself more easily from the cold than from the heat. He cites also Huntington's theory that the average temperature at which mental efficiency reaches its maximum is substantially lower than the temperature at which physical efficiency is greatest. This he submits as proof of his theory that leadership among civilizations must move *coldward*, since the higher civilizations are those dependent upon mental efficiency. The Germans of Tacitus, he says, whose civilization was in its nature "physical," were lazy and sluggish, while modern Germany was able to fight half the world.[60]

[60] Some interesting conclusions are published by the New York State Commission on Ventilation in its report of 1923. After some rather extensive investigations the Commission found that a moderately high temperature, i. e. 86° Fahrenheit, does not diminish ability to do mental work, and that studies of the influence of humidity upon human achievement yielded negative results with respect to both mental and physical efficiency. An increase of *temperature*, however, i. e. from 68° to 75° brought about a decrease of 15% in *physical* efficiency, and higher temperatures caused a still greater decrease in physical ability. In general, it was found that the *temperature* of the air is more important than its humidity or its purity, and that the cooler temperatures are most conducive to physical fitness. Their conclusions with respect to the effect of temperature upon mental efficiency are somewhat at variance with the theories of GilFillan and Huntington, but it should be noted that their experiments dealt entirely with room ventilation, and that, while they were scientifically and painstakingly carried on, the periods of observation were relatively short.

CHAPTER X

HUMAN CONTROL OVER THE PHYSICAL ENVIRONMENT

BY *human control over the physical environment* the writer means not only the actual changes wrought by man in his physical surroundings, but also such other human activities and achievements as have tended to alter the effect of the environment upon man and lessen its control over him. These include social and cultural institutions, systems of education, laws, and scientific discoveries and inventions. Thus, for example, the art of navigation, while it has not directly modified the physical environment, has nevertheless been a most potent factor in freeing man from its domination.

Among ancient writers, Hippocrates is one who does not try to explain everything in terms of the physical environment. He says, for example, that climate and topography are not entirely responsible for the relative feebleness and mildness of the Asiatics as a class. He attributes this in part to their political organization. The people of Asia were slaves to a military system, enjoyed little liberty, were compelled to serve in distant campaigns while their own fields suffered at the hands of their enemies or from neglect, and realized no benefits from their military pursuits, since the spoils went to the rulers. Such a form of organization was not designed to give a spirit of independence or bravery to the inhabitants, and he cites in fur-

ther proof of his theory the fact that many Asiatic peoples not under despotic rule were warlike and vigorous.[1] He adds that Europeans are more warlike than Asiatics not only because of their changeable climate, but "also owing to their institutions, because they are not governed by kings like the latter; for where men are governed by kings, there they must be very cowardly, as I have stated before; for their souls are enslaved, and they will not willingly or readily undergo dangers in order to promote the policies of another; but those that are free undertake dangers on their own account and not for the sake of others; they court hazard and go out to meet it, for they themselves bear off the rewards of victory, and thus their institutions contribute not a little to their courage." [2]

Strabo's profound grasp of the whole environmental problem is nowhere evidenced more clearly than in the passage in which he emphasizes the influence that comes from within man himself rather than from his surroundings. "Arts, forms of government, modes of life, arising from certain internal springs, flourish under whatever climate they may be situated." [3] This passage bears a striking resemblance to modern theories.[4] In another passage, he foreshadows a number of more recent writers by asserting

[1] Hippocrates, op. cit. pp. 173–4, 180, 182.

[2] Op. cit. pp. 180–181.

Attention has already been called to the assertion of Polybius that a detrimental climatic influence may be remedied by a wise system of education and discipline. See above p. 34.

[3] Strabo, *Geography*, Bk. II, chap. iii, sec. 7.

[4] "Living things, and perhaps all things, are characterized by spontaneity; that is, changes, movements are set up within them seemingly without the aid of external causes. . . . The organism is teleological, then, in its very constitution, and the essential ground for its activities lies in its own internal condition—in its organic needs." Ellwood, *Sociology in its Psychological Aspects*, p. 100.

that it is possible for man to overcome the disadvantages of environment. This could come about either through initiative and native ability, as evidenced by the triumph of the Greeks over their naturally barren little country, or in the case of less intelligent peoples, through discipline and education received from a superior nation, notably the Romans.[5]

Now the whole of Europe is habitable with the exception of a small part, which cannot be dwelt in, on account of the severity of the cold, and which borders on the Hamaxœci, who dwell by the Don, Mæotis, and Dnieper. The wintry and mountainous parts of the habitable earth would seem to afford by nature but a miserable means of existence; nevertheless, by good management, places scarcely inhabited by any but robbers, may be got into condition. Thus the Greeks, though dwelling amidst rocks and mountains, live in comfort, owing to their economy in government and the arts, and all the other appliances of life. Thus too the Romans, after subduing numerous nations who were leading a savage life, either induced by the rockiness of their country, or want of ports, or severity of the cold, or for other reasons scarcely habitable, have taught the arts of commerce to many who were formerly in total ignorance, and spread civilization amongst the most savage. Where the climate is equable and mild, nature herself does much toward the production of these advantages. As in such favored regions everything inclines to peace, so those which are sterile generate bravery and a disposition to war. These two races receive mutual advantages from each other, the one aiding by their arms, the other by their husbandry, arts, and institutions. Harm must result to both when failing to act in concert, but the advantages will lie on the side of those accustomed to arms, except in instances where they are overpowered by multitudes. This continent is very much favored in this respect, being interspersed with

[5] Strabo, op. cit. Bk. XVII, chap. iii, sec. 15.

plains and mountains, so that everywhere the foundations of husbandry, civilization, and hardihood lie side by side. The number of those who cultivate the arts of peace, is, however, the most numerous, which preponderance over the whole is mainly due to the influence of the government, first of the Greeks, and afterwards of the Macedonians and Romans.[6]

Bodin was another who insisted that geographic influences are not rigid determiners of national traits. Education, laws, customs and institutions will, if properly designed, tend to correct the shortcomings of a people. The statesman, he held, anticipating Montesquieu, must not apply the same laws to different populations,[7] but must study the natural inclinations of a people in order to correct their defects and foster their virtues.[8] Government correctly applied is a great force to modify the natures and dispositions of a people.[9] Says Meuten: "His originality consisted in that he, in contrast to all of his predecessors, did not merely allude to the several relations existing between the earth and the state as isolated instances, but systematically combined them. He first pointed the way to their significance in explaining historical events, and if Plato has been the first to call attention to their significance for the statesman, Bodin was the first to show him the way in which the knowledge of these relations could be applied." [10]

Montesquieu admits that man may turn the tables on his environment when he says that neither fertility nor the

[6] Op. cit. Bk. II, chap. v, sec. 26.
[7] *Commonwealth*, p. 558.
[8] Op. cit. pp. 564, 567–568.
[9] Op. cit. p. 567.
[10] Meuten, op. cit. p. 54.

lack of it precludes the possibility of a people reacting upon their environment and rendering it by artificial means more favorable for habitation and the making of a livelihood.[11]

Mankind by their industry, and by the influence of good laws, have rendered the earth more proper for their abode. We see rivers flow where there have been lakes and marshes; this is a benefit which nature has not bestowed; but it is a benefit maintained and supplied by nature. When the Persians were masters of Asia, they permitted those who conveyed a spring to any place which had not been watered before to enjoy the benefit for five generations; and as a number of rivulets flowed from Mount Taurus, they spared no expense in directing the course of their streams. At this day, without knowing how they came thither, they are found in the fields and gardens.

Thus, as destructive nations produce evils more durable than themselves; the actions of an industrious people are the source of blessings which last when they are no more.[12]

He goes even a step farther in the following passage, which is clearly a foreshadowing of Buckle's doctrine that the influence of physical environment decreases in proportion as civilization advances:—

Mankind are influenced by various causes: by the climate, by the religion, by the laws, by the maxims of government, by precedents, morals, and customs; whence is formed a general spirit of nations.

In proportion as, in every country, any one of these causes acts with more force, the others in the same degree are weakened. Nature and the climate rule almost alone over the savages; customs

[11] Montesquieu, op. cit. Bk. XVIII, chap. vii.
[12] Idem.

govern the Chinese; the laws tyrannize in Japan; morals had formerly all their influence in Sparta; maxims of government, and the ancient simplicity of manners, once prevailed at Rome.[13]

Man's ingenuity, says Ferguson, enables him to overcome the disadvantages of any climate or situation, whether it be in the tropics or beyond the polar circle.[14] He has a passion for overcoming difficulties and will forsake lands which are healthful and easily tillable in order to drain the "pestilent marsh" or fence off the sea "with mighty barriers." [15]

Elegant and magnificent edifices are raised on foundations of slime; and all the conveniences of human life are made to abound, where nature does not seem to have prepared a reception for men. It is in vain to expect, that the residence of arts and commerce should be determined by the possession of natural advantages. Men do more when they have certain difficulties to surmount, than when they have supposed blessings to enjoy: and the shade of the barren oak and the pine are more favorable to the genius of mankind, than that of the palm or the tamarind.[16]

Attention has already been called to Herder's view of social evolution as an organic and unified process in which the spirit of mankind is the impelling force.[17] Not only are man's innate powers modified by his environment, but man is himself capable of altering the environment or adapting it to his own purposes. Europe was once a dark, damp forest, but man has changed it to a sunny, cultivated region, and the nature of the inhabitants has changed along

[13] Op. cit. Bk. XIX, chap. iv.
[14] Adam Ferguson, op. cit. p. 166.
[15] Ibid. p. 182.
[16] Idem.
[17] See above, chapter iv, pp. 70–73.

with the climate. The valley of the Nile would be nothing more than a bed of slime "but for the art and policy of man." These and many similar changes have come about through man's adaptation of his natural surroundings to his own use. "We may consider mankind, therefore, as a band of bold though diminutive giants, gradually descending from the mountains, to subjugate the earth, and change climates with their feeble arms. How far they are capable of going in this respect futurity will show." [18] This statement, remarkable for its time, was published nearly three quarters of a century before the works of Ritter and Buckle made their appearance.

Humboldt suggests the theory, later developed by Buckle and others, that geographic conditions are much more important in the primitive stages of man's development than in the more advanced stages of human knowledge and intelligence:—

> Among nations least advanced in civilization, the imagination revels in strange and fantastic creations, and by its predilection for symbols, alike influences ideas and language. Instead of examining, men are led to conjecture, dogmatize, and interpret supposed facts that have never been observed. . . . But by degrees, as man, after having passed through the different gradations of intellectual developments, arrives at the free enjoyment of the regulating powers of reflection, and learns by gradual progress, as it were, to separate the world of ideas from that of sensations, he no longer rests satisfied merely with a vague presentiment of the harmonious unity of natural forces; thought begins to fulfill its noble mission; and observation, aided by reason, endeavors to trace phenomena to the causes from which they spring.[19]

[18] Herder, op. cit. pp. 316–17.
[19] Cosmos, Vol. I, p. 37.

Ritter attaches great significance to man's constantly increasing mastery over the conditions and forces of his natural surroundings. Many parts of the earth, he holds, are important chiefly because of changes in their nature which have been wrought by man.[20] Inventions have profoundly modified the effect of geographic conditions and what was once an obstacle to progress and prosperity is now often its chief aid. The progress of navigation has changed the relationship of man to his fellow men in other parts of the world and of nation to nation. It has greatly shortened the length of rivers and has made them almost as easily navigable up stream as down.[21]

Railroads and canals have likewise brought colossal changes and have given an entirely new meaning to "lowlands, plains, and valleys." He points out that a canal through the Isthmus of Suez would make a wonderful route to the East Indies and that one through the Isthmus of Panama would shorten the journey around the world and bring China six thousand miles nearer to Europe.[22] "The whole physical conditions of earth are changed as the mind of man gains wider and firmer rule; and in the course of centuries the subtle life and less palpable characteristics of nations assume different aspects." [23]

In agreement with Montesquieu and more recent writers, including Humboldt and Buckle, Ritter maintains that the geographic environment exerts the greatest influence upon man in the primitive stages of his development, and he avers that we may still see traces of the differences thus

[20] Gage, op. cit. p. 257.
[21] Ibid. pp. 257–263.
[22] Ibid. pp. 335–6.
[23] Ibid. p. 267.

wrought in peoples whose early history is little known. As man develops in knowledge, and is more and more able to control nature, geographic influences decline in importance.[24] In the primitive stages, when nations were relatively isolated, influences such as climate, soil and topography were much more important than now. Consequently, differences in culture and civilization were much more marked than at present when facilities for travel and communication are so highly developed. Geographic influences come to have different effects also from the shifting of peoples through migration and conquest, which changes the material upon which nature has to work. This is a good answer to the objection raised by Hegel in his criticism of environmental theories, that the Turks now live where the Greeks formerly dwelt.[25]

Buckle, also, held that environmental influences operate most effectively upon primitive peoples and lower civilizations. The history of western Europe is characterized, he holds, by a diminishing influence of physical factors and an increasing importance of psychological and cultural factors.[26] As examples of this mastery over nature, he points to the constantly increasing span of human life, to the number of formerly inevitable dangers man is now able to avoid, to the progress in the control of disease, and to the destruction of predatory animals and birds. All of these he lists under control of environment, whether they accomplish an actual change in the environment itself, or merely aid man to free himself from its domination.[27]

[24] Gage, op. cit. pp. 257–8.
[25] Ibid. pp. 249–50, 273.
[26] Op. cit. pp. 109–112.
[27] Ibid. pp. 110–111.

The degree of this triumph of mind over external nature is the best measure of civilization, and, therefore, mental influences are more important for advanced civilizations than physical influences.[28] These last doctrines are not given the consideration they deserve by those who designate Buckle as a materialist.[29]

Spencer is another who held that all environmental influences are most effective in the early stages of social evolution. It was because primitive man was almost wholly at the mercy of his surroundings that no appreciable progress was made for one hundred thousand years or more:—

> One result of enumerating these original external factors and observing the parts they play, has been that of bringing into view the fact, that the earlier stages of social evolution are far more dependent on local conditions than the latter stages. Though societies such as we are now most familiar with, highly organized, rich in appliances, advanced in knowledge, can, by the help of various artifices, thrive in unfavorable habitats; yet feeble, unorganized societies can not do so. They are at the mercy of their surroundings.
>
> Moreover we thus find answers to the questions sometimes raised in opposition to the doctrine of social evolution— How does it happen that so many tribes of savages have made no manifest progress during the long period over which human records extend? And if it is true that the human race existed during the latter geologic periods, why, for 100,000 years or more, did no traceable civilization result? To these questions, I say, adequate replies are furnished. When, glancing over the classes and orders of original external factors above set down, we observe how rare is that combination of favorable ones joined with absence of unfavorable ones,

[28] Ibid. pp. 112–113.
[29] Cf. J. M. Robertson, *Buckle and His Critics*.

by which alone the germs of societies can be fostered—when we remember that in proportion as the appliances are few and rude, the knowledge small, and the co-operation feeble, the establishment of any improvement in face of surrounding difficulties must take a long time—when we remember that this helplessness of primitive social groups left them exposed to each adverse change, and so caused repeated losses of such advances as were made; it becomes easy to understand why, for an enormous period, no considerable societies were evolved.[30]

According to Ratzel, one of the most important steps in human progress was the conquest of the great bodies of water through the discovery of the art of navigation. This broke up the tendencies toward an ingrowing culture, retrogressive trends, and cultural isolation, and greatly hastened the early development of divergence, variegation and differentiation. In modern times, also, the conquest of the sea has not lost its political significance. England, having first and best conquered the ocean in modern times, has become the strongest nation on earth. The command of the sea is the natural agency for the command of more land than the control of commerce. Nevertheless, this can be carried to a dangerous extreme by reducing the dependence of a state upon land and greatly increasing its dependence upon maintaining control of water connections. Culturally, also, the development of sea-going is of the greatest significance. Seafaring has ever been a most potent instrument in breaking down isolation and provincialism and in adding to existing knowledge. The conquest of the sea tends to broaden and unify the culture of

[30] Op. cit. pp. 35–36.

the seafaring states, for it tends to bring all in contact with the same widely differing cultures.[31]

Treitschke maintains that mankind is able to change its environment both for better and worse. He mentions deforestation as the chief type of destructive alteration, and the draining of swamps and the clearing of lands as a beneficent type which brings about an improvement of both climate and soil. The white races have been the leaders in overcoming the disadvantages of environment and this quality has brought about the great physical improvement of Europe, which has brought European nations into a position of leadership and domination over the whole world.[32]

In his work on *Man and Earth: the Reciprocal Relations of Man and his Environment,* Alfred Kirchhoff offers an interpretation of the relation between geographical surroundings and the evolution of culture and social organization. In the ancient controversy over the relative power and influence of man and his environment he admits the growth of man's power over Nature but differs from Buckle in contending that even at the present time "the power of our planet over our race is greater than that of the race over the planet." To illustrate the nature of man's dependence upon the earth, he cites the facts that man is an organism and a product of the planet, that his habitation is limited to the surface of the earth, high alti-

[31] Ratzel, loc. cit. pp. 89–91.
Ratzel's thorough knowledge of history made him always conscious of the many ways in which changes in human culture are continually modifying the nature of environmental influences.

[32] Treitschke, op. cit. Vol. I, pp. 205–7.

tudes being too cold and the interior of the earth too warm; and that the earth once could not support man and probably at some later time will be unadapted for human habitation, the existence of man being but an episode in the history of the world.[33]

Kirchhoff presents an interesting analysis of the influence of the sea on the life of nations. In primitive times a great barrier to the movement of mankind, it has been conquered by the art of navigation, man being drawn to it by the need of fish or driven to it by enemies, and as his confidence increased, attracted to it by the opportunity for piracy and robbery of coast towns. Land resources furnish the ships and provide the incentive for navigation and exploration. The growth of navigation has greatly aided the development of civilization. The art itself has promoted an important branch of science and technique; more generally, by stimulating exploration and commerce, it has helped to spread the material factors of civilization. Particularly has it contributed to the growth of ethnography and geography by making it possible to know the whole face of the earth and all its inhabitants.[34]

In agreement with Ritter, Kirchhoff asserts that an adequate science of geography must include the man upon the earth as well as the physical features of the planet.[35] As examples of man's influence upon the land and its adaptation to new uses he cites the building of railroads and canals, irrigation and drainage projects, deforestation, the introduction of new crops and animals, and the navigation

[33] Kirchhoff, op. cit. pp. 3–5.
[34] Ibid. pp. 29–44.
[35] Ibid. pp. 85–86.

of inland waters. The United States and Australia are among the most conspicuous examples of a rapid conquest of nature, a process which always proceeds most rapidly when carried on by the technological processes of modern industrial life. He also shows the striking differences which civilization has made in the physical features of Germany since the time of Tacitus. He concludes this discussion with an opinion contrary to that of Buckle, namely:

> It is not true to say that the progress of civilization liberates man from the influence of mother-earth: on the contrary, it is always knitting him with it more and more intimately and comprehensively. We feel ourselves more and more at home on the earth, more and more fortunate in being able to turn to account its gifts and its forces, and yet it remains the fundamental basis of human activity.[36]

In his general conclusions regarding the totality of environmental influences upon social progress, Reclus wisely distinguishes between culture, environment and the dynamic process of their interrelation, known as history. He emphasizes the fact that man is continually conquering his environment, transforming it and adapting it to his use. All of these different environmental influences, their resultant effect, and their alteration with time and social progress, show the futility of trying to interpret history in terms of one or all the influences of the physical environment. At best one can only realize the vast number of the influences at work and try to understand and evaluate them.[37]

[36] Ibid. p. 108.
[37] Op. cit. pp. 114–120.

Brunhes is as much concerned with the reaction of man to nature in changing his physical environment as he is with the cataloguing of the various types of control exerted by the physical environment over man.[38] Further, he views the physical environment as not merely the natural features of the earth, but also the surroundings which man has himself erected. In other words, a modern city block is quite as much a part of man's physical environment as is a mountain range or a desert.[39]

> The ensemble of all these facts in which human activity has a part forms a truly special group of surface phenomena—a complex group of facts infinitely variable and varied, always contained within the limits of physical geography, but having always the easily discernible characteristic of being related more or less directly to man. To the study of this specific group of geographical phenomena we give the name "human geography."[40]

Man is a part of the group of objects inevitably influenced by the physical environment, but according to Brunhes, he is not absolutely determined by it. He is dominated at different times by different geographical forces, but at the same time he also controls and directs other geographic forces to his own use. This two-fold relationship—that of man dominated in some respects by geographical factors and himself controlling others—must always be kept in mind. It makes clear how human activ-

[38] "If one consult such a well-known book as that of R. F. Scharf, on the faunæ of Europe, one finds that the only two factors which are to-day introduced to explain the distribution of animal population are, first, the continental continuity (present or past), and, second, the intervention of man—factors which are both of a distinctly geographical character." Brunhes, op. cit. p. 18.

[39] Ibid. pp. 1–4, 178 ff., 389 ff.

[40] Ibid. p. 4.

ities cannot be divorced from geography or geography from a study of the achievements of mankind.[41]

According to Vallaux, the essence of the problem of political geography is found in the answer to the following questions:

> Is it true that the life of political societies is determined in something more than a slight degree by the physical setting in which they develop? In what manner do the soil, the air and the waters, which represent a permanent element in the evolution of states, coöperate with the increasingly variable and ever renewed collective activity of mankind? [42]

He points out the scientific errors which result from a too thorough-going acceptance of the geographic explanation, insisting that the adaptation of society to the physical environment is active as well as passive, and that there can be no absolute geographic determinism.[43] Following an enumeration of the various physical factors involved in social causation, including climate, rivers, and land configuration, he holds that these agencies can in no way afford an explanation of the origin and the characteristics of states. To them must be added important psychic and cultural forces.[44]

In his concluding passages, Vallaux summarizes his theoretical position. Physical geography and the state are two fields of knowledge which may properly be studied together, for the state is a social organism founded upon soil or territory. Yet anthropogeography cannot hope to

[41] Op. cit. p. 27. See also Brunhes and Vallaux, *La Géographie de l'Histoire*.
[42] Vallaux, *Géographie sociale: Le sol et l'État*, pp. 7–8.
[43] Ibid. pp. 18–21.
[44] Ibid. pp. 143–144.

arrive at correlations which are equal in degree to those attained in the natural sciences. It must reject absolute environmental determinism, especially that which rests upon the influence of any one physical factor. Yet there is a real relationship between the state and its territory, particularly that influence which leads to the differentiation of the population and the production of distinctly national character.[45] He well summarizes his position thus:

> In short, what is the fundamental concept of social geography? It is the concept of an ever developing process of differentiation, which not merely indicates the dependence of political society upon the territory occupied, but which, along with passive adaptation and environmental determinism, also recognizes the real significance of active adaptation and social determinism.[46]

Metchnikoff maintains that the influence of geographical factors is not absolute and invariable throughout the different stages of social evolution but varies with the degree of the development of culture and social institutions. The more highly coöperative activities are developed in any population, the more effectively such a group can control and utilize the environment and render itself relatively independent of the domination of its habitat.[47] "We are not, then," he says, "defenders of that 'geographical fatalism' which pretends, though running counter to the best established facts, that a given combination of physical conditions can or must invariably play, everywhere and always, an identical rôle in history."[48]

[45] Vallaux, op. cit. pp. 395 ff.
[46] Ibid. p. 398.
[47] Op. cit. p. 41.
[48] Ibid. p. 128.

Professor Robert DeC. Ward maintains that the chief fact which distinguishes climatic influences from those of other environmental factors, such as soil and topography, is that man, especially civilized man, cannot so directly and effectively control the climate as he can the other factors through his own ingenuity and invention. He can protect himself against it, however, which is a form of control. Thus to Ward "a gradual transition from the primitive shelter made of branches of trees, of skins, or leaves, to the permanent and highly elaborate modern building, which is both heated and cooled artificially," is an illustration of man's control over his environment, as is likewise "the transition from the primitive and scanty clothing made of leaves or bark where trees grow, or the skin of an animal where trees are lacking, or warmer clothing is needed, to the manufactured and perhaps imported garment of wool, or cotton, or silk." And these are not the only ways in which man turns the tables on his environment. Forests are being cut down to secure land for agricultural purposes. By means of irrigation crops are being grown on land hitherto considered barren and unproductive. Even deserts are transformed into productive areas wherever it is possible to secure a supply of water. "From the wandering hunting and fishing tribes of the African forest or of the borders of the Arctic sea, through the farming populations of the cleared forest and of the steppe, to the crowded industrial centres of the modern city, there is such a gradation. It is the story of a more complete to a less complete mastery of man by his environment."[49]

[49] Ward, op. cit. pp. 220–221, 226. Cf. Raoul Blanchard, "Flanders," in *The Geographical Review*, Vol. IV, No. 6, Dec. 1917, pp. 417–33. The author

Dr. Lester F. Ward held that the development of society is divided into two great sequential parts, social genesis and social telesis. In the former, social structures and functions evolve through the operation of natural forces upon the raw material furnished by man and his physical surroundings. In this stage of development it is evident that geographical factors will exert a very significant influence upon social evolution.[50] But as soon as man understands the nature of social forces and the means of controlling them, social evolution passes out of the unconscious stage in which progress is brought about, if at all, by the wasteful trial-and-error methods of nature, into the advanced stage in which man consciously directs the development of society to previsioned ends. Social development thus becomes a matter of "collective telesis," which Ward regarded as the most important factor in the future progress of mankind.[51] In this way Ward provides a fundamental sociological explanation of the doctrine of Buckle and others that the factors of the external environment decrease in proportion to the development of culture and human intelligence.

According to Dr. W. I. Thomas, in his *Source Book for Social Origins,* culture and its development are much more dependent upon the human mind than upon geographical conditions. Though the material surroundings may condition progress as to its particular characteristics and rate of development, the most important cultural forms of social

shows how geographical features have influenced the life of the people, and how many of the natural handicaps of the country have been overcome through coöperative enterprise.

[50] Ward, *Pure Sociology,* pp. 463–471.

[51] Ibid. pp. 463 ff., 573–575.

institutions are much the same the world over. The influence of the physical environment is most effective upon peoples in lower stages of cultural evolution, and the more advanced the society the greater the part played by ideas. The best measure of cultural progress Professor Thomas holds to be the degree to which the social group has been able to exert a conscious and effective control over the environment. He contends that cultural backwardness is much more a matter of a lack of control over material factors than of racial inferiority. There is little reason to believe that the present backward races would long show any cultural inferiority if they possessed the same technique for utilizing the environment that is found among the more advanced peoples. One of the most rational methods of classifying cultures from the most primitive to the most advanced types would be to base this classification upon the degree of control manifested by the group over the physical environment.[52] Professor Thomas' views are well summarized in the following citation:—

In connection with the whole question of the relation of geographical environment to culture, I feel that in one sense this relation can hardly be exaggerated, while in another sense it may be greatly overdone. Mason's paper on technogeography brings out the absolute dependence of man on nature. He may be more or less cunning in finding out what he can get out of nature, but he can secure nothing which she does not afford. On this score we need not hesitate, and we can also have no doubt that in certain regions nature affords more than in others. But after all culture is more fundamentally connected with the operations of the human mind than with the aspects of nature. Nature may affect the rate and

[52] Thomas, op. cit. pp. 130–133.

particular form of progress and limit its degree, but human society takes the same general pattern everywhere. Every people has its laws, its commandments, its religion and superstition, its marriage, its art, its property, etc. . . .

It is plain also that the force of climate and geography is greater in the lower stages of culture and that ideas play an increasing rôle. The peculiar cultures of Japan, China, and India were the results of psychic rather than geographic factors in the first place, and the transformation they are now undergoing is again one of ideas. . . .

Nor is it surprising that different groups of men progressed in different ratios, because of difference in opportunity afforded by the geographical environment, and the varying nature of crisis and reaccommodation. And in this connection we should once for all discard the habit of thinking of the lower races *en bloc*. There is as much difference between the North American Indian and the Australian as between the Indian and the white man. Between the Australian or the Wood Veddah of Ceylon and the ancient Greek or the modern German, it would be possible to make a rough but continuous classification of culture on the principle of more or less complete control of environment.[53]

Frederic Le Play was one of the most distinguished French economists and sociologists of the last century, and he is rightfully regarded as the founder of the social survey method of investigation.[54] Although by profession a

[53] Thomas, op. cit. pp. 130–133.

[54] His chief works are: *Les Ouvriers européens*, 1st ed. 1855, containing monographic studies of families; *La Réforme sociale*, 3 vols. 1864—based on idea of importance of increasing the social functions of the family—in fact, advocating a return to the family-group organization; *L'Organisation du travail*, 1870 based on *La Réforme sociale; L'Organisation de la famille*, 1871, carries further his emphasis on the importance of the family and its reconstitution; *La Paix sociale*, 1871; *La Constitution de l'Angleterre*, 1875; *La Constitution essentielle de l'humanité*, 1880. For best English account of his life and works see Henry Higgs in the *Quarterly Journal of Economics*, Vol. IV, 1890, pp. 408–433.

mining engineer and a leading authority on metallurgy, his reputation rests upon his work as a social reformer, and his environmental theories can be adequately understood only when studied in connection with his social philosophy and his efforts in social reform.

Le Play was interested in discovering some practical solution of the social and economic problems created by the Industrial Revolution. He believed that these problems could be solved most effectively by establishing as the fundamental social and economic unit what he called the "family-group," an organization mid-way between the extensive and rigid patriarchal group of antiquity and the unstable family of modern times. Because he assigned all importance to the reconstruction of the family as the best means of social reform, he and his followers made many detailed studies of the social and economic conditions existing among the families of working men throughout Europe, and especially in France. The monographic products of these studies are the chief contributions of the Le Play school to social science.[55] Among the chief aspects of family life and circumstances examined in these monographs was that of their physical environment. In outlining his method of investigation Le Play enumerated the following environmental conditions as worthy of tabulation:— (1) Constitution and relief of the soil; (2) mountains, forests, and rivers situated in the locality; (3) the channels of communication; (4) climate; (5) hygienic conditions due to the nature of the locality; (6) agricul-

[55] For the form that he followed in his monographic examination of the families of workmen see Charles A. Ellwood, "The Le Play Method of Social Observation" in *The American Journal of Sociology*, Vol. II March, 1897, pp. 662–679.

tural products, industries, commercial development.[56] Mr. Victor V. Branford has admirably summarized the aims of the Le Play school in its investigation of the above mentioned environmental influences:—

(1) What sort of a place is it that a people inhabit—as to soil, climate, flora and fauna, etc.? (2) How do the people get their living by utilizing the resources of the territory they inhabit? (3) What types of character, what varieties of personality, what sort of social relations, can be observed among the people, and what causal relations can be established between these types of character, these social relations, on the one hand, and, on the other, the occupations of the people and their geographic surroundings? [57]

Although Le Play's own contributions to environmental theory were mainly practical and descriptive, he did, nevertheless, proceed upon the notion that there is a definite relation between environmental, social and economic factors. He was not an extremist in his doctrine of the relative importance of physical and social forces but took the rather broad view of a reciprocal influence between them. This thesis of Le Play is also effectively set forth by Mr. Branford:—

The line of social causation runs from the physical and organic environment through occupation to family life and social institutions, and then back again through the reaction of ideals on family life and social institutions—the reaction of these on occupation, and of this on the environment.[58]

It may be observed that Le Play's chief contribution to

[56] Ellwood, loc. cit. p. 676.
[57] V. V. Branford, "The Founders of Sociology," *American Journal of* Sociology, Vol. X. July, 1904, p. 115.
[58] Victor V. Branford, in *Sociological Papers*, 1904, p. 39.

social science was to outline a method of social investigation, and his importance in the history of environmental doctrines lies in the fact that this method took into account the importance of the physical environment in its relation to society, especially its effect upon the economics of family life, and the natural region, and that he founded a school which has carried on his methods and doctrines.

The theories of Patrick Geddes, a foremost British sociologist and civic reformer, combine the anthropogeographic approach with a practical application of Lester F. Ward's notion of the conscious direction of social evolution by society itself. His theories show the influence of Le Play, and he is best known for his insistence that a healthy human organism and sound social institutions and conditions demand a favoring environment; that since the Industrial Revolution cities have become the basis of social life; and that these cities must be scientifically planned and constructed if they are to afford the living conditions necessary for the best development of the human race.[59] He sums up the problem of city-planning as follows:

> Thus there emerged the conception of the intersocial struggle for existence, as dependent no longer mainly, as so many suppose, upon the issue of international war, nor even as pacifists assume, upon the maintenance of the present stage of industry at its present level, by amicable negotiations. Peace and prosperity depend above all upon our degree of civic efficiency, and upon the measure

[59] The germ of his general theory is contained in an address entitled *An Analysis of the Principles of Economics* delivered in 1884 before the Royal Society of Edinburgh. He later expanded his ideas in a series of three papers printed in the *Sociological Papers* for 1904–6. These earlier theories are brought together and greatly amplified in his *Cities in Evolution, An Introduction to the Town Planning Movement and to the Study of Civics*, London, 1915.

in which a higher phase of industrial civilization may be attained in different regions and by their civic communities.[60]

The Industrial Revolution, says Geddes, brought about the conditions which produced the present day urban centres of population, industry and commerce. But these conditions are now producing a second and extremely important industrial revolution, namely, the change from a paleotechnic to a neotechnic urban and economic civilization.[61] The paleotechnic organization was based upon the old capitalism which emphasized the employer's profit and thought little of the welfare of the community. This resulted in ill-constructed cities with their slums for the industrial proletariat. The neotechnic order is based upon the idea of "conserving the energies and organising environment towards the maintenance and evolution of life, social and individual, civic and eugenic." This will result in the new scientifically planned cities which Geddes advocates.[62]

Too great haste must be avoided, says Geddes, in introducing the new cities of the neotechnic age. Careful study must be made of all progress being achieved in civic development at home and abroad. The results of such study will be the basis for the scientific city-planning of the future, but they must be brought together in a civic museum and used for civic education which will interest and instruct the public and enlist their support.[63] The new civics will have an important relation to eugenics. Most

[60] *Cities in Evolution*, p. 393.
[61] Ibid. pp. 60 ff.
[62] Ibid. pp. 60 ff.
[63] Ibid. pp. 84 ff., 295 ff.

of those called "degenerates" by eugenists are but "deteriorates" produced by a depressive environment. Those types which most easily succumb to an inferior environment would most quickly respond to a better environment and rise above the average. This improvement would be not only biological, but also economic, moral and cultural.[64]

Professor Geddes' view of the basic importance of cities and their regional development is reiterated in *The Coming Polity* written in collaboration with V. V. Branford (London, 1919). "Behind the rise and fall of states, nations and empires, may be discerned the struggle of cities for freedom to develop their own regional life."[65] He shows how Le Play was interested in reconstructing the life of the peasant, while Comte had the viewpoint of the Parisian. These two lines of approach Geddes claims to unite in his Edinburgh School.[66] He claims to seek the coordination and intermingling of town and country life and interests in each regional unit. Yet the city is prior in importance. "The regional life concentrates in the city and functions through its activity."[67]

The task of reconstruction, according to Geddes, is chiefly "one of transition from the competitive individualism of pre-war days to the larger union which, if we knew how to cultivate it, should be the fruit of the war."[68] The future state must unite (1) the temporal and the spiritual; (2) the regional and the civic; and (3) the individual and

[64] Ibid. pp. 388–9.
[65] Op. cit., Introduction, p. ix.
[66] Ibid. pp. 48 ff., 58.
[67] Ibid. pp. 130 ff., 156.
[68] Ibid. p. 215.

the social. An attempt must be made to capitalize for society the energy of social coöperation—to utilize social synergy.[69] In his doctrines we thus find one of the few comprehensive anthropogeographic theories which, while recognizing the importance of the physical environment, aims to control and direct it for man's use and to make this control the foundation of social reform.[70]

In the concluding chapter of his *Geography and World Power,* James Fairgrieve takes a glimpse at *future possibilities* in which his *geographical controls* of human activity and what we have included under *human control* of geographic factors are, curiously enough, quite similar. Geographical controls, he says, "act in many different ways according to the amount and kind of knowledge and experience which man has accumulated." This view, it may be noted, is in general harmony with our definition of *man's control over his environment* as including such human achievements as have tended to alter the effect of the environment upon man and lessen its control over him. It is suggestive, also, of Buckle's theory that history is characterized by a diminishing influence of physical factors and an increasing importance of psychological and cultural factors.

Advancement, says Fairgrieve, may come about in two ways—first, the controls we now have might act in dif-

[69] Geddes and Branford, op. cit. pp. 288 ff.

[70] Miss Marion I. Newbigin, a student and associate of Professor Geddes, has presented an excellent brief survey of geography from the dynamic standpoint in her *Modern Geography* (New York and London, 1911). Her more recent work, *Geographical Aspects of Balkan Problems in their Relation to the Great European War* (New York, 1915), is a good analysis of geographic and ethnic factors which contributed to the onset of the Great War.

ferent ways, and second, supplies of energy not hitherto available might be utilized. Moreover, sources of energy now in use might be exhausted, as, for example, coal fields, oil fields, and productive soils. If the world's consumption of coal were to increase at its present rate all of the sources in England, Germany and the United States would be exhausted in about one hundred and fifty years. The same holds true of the known supply of petroleum, which will probably be exhausted in a much shorter time. There is also a theory that some regions are becoming drier and another that regular climatic cycles exist with alternating wet and dry periods, both of which, if valid, would have a profound effect upon history.[71]

As to the possible future utilization of supplies of energy not now available, Fairgrieve offers some interesting suggestions. First, the energy of the tides might be used, and that of the winds to a much greater extent than at present, although the original cost of such enterprises would doubtless be high in proportion to the returns. Moreover, if all of the water power of the world were to be utilized, the energy produced would fall far short of the amount now obtained from coal. It is evident, therefore, that other sources of energy must be found, and Fairgrieve discusses several possibilities including ways of using "energy given out by certain forms of matter," e. g. radium, means of using the earth's internal heat, new methods by which larger crops can be obtained from a given area, improved varieties of wheat and similar products, ways of utilizing the energy in the vast growth of vegetation in the tropics, better methods of alleviating human suffering, and the pos-

[71] Fairgrieve, op. cit. pp. 345–347.

sibility of turning to account the stupendous amount of solar radiation in the deserts.[72] In all of the changes suggested by Fairgrieve, whether they are now within man's reach or merely dreams of future achievement, "geography would still control the course of history, but it would control it in a different way." [73]

[72] Fairgrieve, op. cit. pp. 348–355.

[73] Cf. Benjamin Kidd, op. cit. This writer believes that it is the *duty* of the English-speaking peoples to control and develop the tropics "as a trust for civilization, and with a full sense of the responsibility which such a trust involves."

See also O. D. Von Engeln, *Inheriting the Earth*, New York, 1922. The author is interested, "not so much to show that human organization and development *have* been determined by geographic conditions," as he is in insisting "that in the future they *should* be." *Place*, he says, is the important consideration, if man is to inherit the earth, and regional geography "the initial field of study." He emphasizes the need of an understanding of *environmental control* in order that man may learn how to utilize the resources of his environment as intelligently and as completely as possible.

CHAPTER XI

CRITICS OF GEOGRAPHIC DETERMINISM

1. *Hume and the Romanticists*

IN discussing the influence of the physical environment upon national characteristics, David Hume went to the opposite extreme from Montesquieu, and offered psychological explanations which are suggestive of Bagehot, Tarde and Sumner. The vulgar, he said, are likely to carry the notion of national characteristics too far, but he admits, nevertheless, that there are certain general types of manners or qualities which attach themselves to nations.[1] Two causes, according to Hume, have been offered to account for this fact: first, a moral cause, really mental, which he defines as "all circumstances which are fitted to work on the mind as motives or reasons, and which render a peculiar set of manners habitual to us"; second, a physical cause, which he defines much as Montesquieu did, namely—"those qualities of the air and climate which are supposed to work insensibly on the temper, by altering tone and habit of the body, and giving a particular complexion, which, though reflection and reason may sometimes overcome it, will yet prevail among the generality of mankind and have an influence on their manners."[2]

[1] Hume, *Essays, Moral, Political and Literary*, Green and Grose edition, Vol. I, p. 244.
[2] Ibid.

That moral causes have a substantial bearing on national characteristics cannot be doubted by the most casual observer, says Hume. A nation is but a collection of individuals, and individual characters are very often fixed in this way. For example, poverty or hard labor will unfit a people for the pursuit of science; or tyranny, smothering genius, may destroy a leaning toward the liberal arts in any nation. Moreover, the profession a man follows will alter his natural disposition somewhat, and the members of any profession tend to approach a general type.[3]

As to physical causes, on the other hand, Hume says: "I am inclined to doubt altogether of their operation in this particular; nor do I think, that men owe any thing of their temper or genius to the air, food, or climate."[4] He admits that this may seem untrue at first sight, since it cannot be denied that physical influences operate on every animal except man.[5] This raises the perplexing question as to why these causes are not operative in the case of man. In his answer to this question his principal arguments are summed up in a striking paragraph:—

> The human mind is of a very imitative nature; nor is it possible for any set of men to converse often together without acquiring a similitude of manners, and communicating to each other their vices as well as virtues.[6] The propensity to company and society is strong in all rational creatures; and the same disposition, which gives us this propensity, *makes us enter deeply into each other's sentiments, and causes like passions and inclinations to run, as it were, by contagion, through the whole club or knot of companions.*

[3] Hume, op. cit. p. 245.
[4] Ibid. p. 246.
[5] Ibid. p. 247.
[6] Compare Tarde's effort to make imitation the basis of a sociological system.

Where a number of men are united in one political body, the occasions of their intercourse must be so frequent, for defence, commerce, and government, that, together with the same speech or language, they must acquire a resemblance in their manners, and have a common or national character, as well as a personal one, peculiar to each individual. Now though nature produces all kinds of tempers and understandings in great abundance, it does not follow that she always produces them in like proportions, and that in every society the ingredients of industry and indolence, valour and cowardice, humanity and brutality, wisdom and folly, will be mixed after the same manner. *In the infancy of society*, if any of these dispositions be found in greater abundance than the rest, it will naturally prevail in the composition and give a tincture to the national character.[7] Or should it be asserted that no species can reasonably be presumed to predominate, even in those contracted societies, and that the same proportions will be always preserved in the mixture; yet surely the persons in credit and authority, being still a more contracted body, cannot always be presumed to be of the same character; and their influence on the manners of the people, must, at all times, be very considerable. If on the first establishment of a republic, a Brutus should be placed in authority, and be transported with such an enthusiasm for liberty and public good, as to overlook all the ties of nature, as well as private interest, such an illustrious example will naturally have an effect on the whole society, and kindle the same passion in every bosom. Whatever it be that forms the manners of one generation, the next imbibe a deeper tincture of the same dye; men being more susceptible of all impressions during infancy, and retaining these impressions as long as they remain in the world. *I assert, then, that all national characters, where they depend not on fixed moral causes, proceed from such accidents as these, and that physical causes have no discernible operation on the human mind.* It is a maxim in all philosophy, that causes which do not appear, are to be considered as not existing.

[7] The germ of the theme developed by Bagehot in his *Physics and Politics*.

If we run over the globe, or revolve the annals of history, we shall discover everywhere signs of a sympathy or contagion of manners, none of the influence of air or climate.[8]

Hume next cites nine points in support of his sweeping denial of the operation of physical forces upon mankind in the fixing of national characteristics. First, a uniform system of government will, if long continued, bring about similarities of character in spite of climatic differences—e. g. China. Second, small and contiguous nations are often greatly different in character, as, for example, Athens and Thebes.[9] Yet there could hardly be enough difference of climate or air to account for this difference in character. Third, national character generally extends to the borderline of a country, and yet the crossing of a mere boundary could hardly produce physical causes sufficient to bring this about.[10] Fourth, any peculiar race or sect of men who keep in close communication with each other, like the Jews in Europe, the Armenians in Asia, or the Jesuits, tend to a similarity of manners. Fifth, if two nationalities inhabiting the same country are kept from extensive communication by a difference in language, they will preserve a strictly separate set of manners. Sixth, the same set of manners follows a nation all over the world.[11] Seventh, the characteristics of any nation change from time to time

[8] Hume, op. cit. pp. 248–249. Hume is here even more unilateral than Montesquieu, for the latter recognized the effect of imitation.

[9] Hume did not comprehend, or at least admit, that the commercial activity of Athens was a cause of this difference.

[10] Although this is often the case it is often the opposite, and people on the border many times resemble the neighboring country's characteristics more than those of their own.

[11] In the last two cases it is evident that Hume does not allow physical causes long enough time in which to operate, nor does he in either case account for the origin of peculiarities.

with the air and climate remaining practically constant. Eighth, if several neighboring nations are in close communication with each other they will have a similar set of manners and customs. Ninth, conversely, there may be found, as in England, the greatest diversity of manners in the same nation, speaking the same language, and subject to the same government.[12]

If differences of air and climate have so great an influence upon mankind, says Hume, then the different degrees of heat and cold should have a great effect, and, he says, it may be granted that people living beyond the polar circles or in the tropics are inferior to the remainder of the human species, but even this may be traced to the poverty and misery of the northerners, and to the indolence of the southerners, which arises from their plenty. It is clear he is thinking only of direct climatic influences for he must have seen that it was in the last analysis the climate which was responsible by causing the abundance or scarcity of the means of subsistence.[13] Many contend, he says, that a warm climate influences the imagination of men and makes them vivacious, but the French, Greeks, Egyptians and Persians are noted for their vivacity and the Spaniards, Turks, and Chinese for their gravity, without sufficient differences of climate to account for the differences in character. Again, the Greeks and Romans had considered northerners barbarians and had tried to represent learning and culture as peculiar to southern nations, but subsequent history had exposed the fallacy of such reasoning. From the fact that

[12] Ibid. pp. 249–252. It is evident that Hume accounts here merely for the spread of manners or the reduction of a nation to a uniform type and in no case explains why a national character came to be what it is.

[13] Ibid. p. 252.

most conquests have been made by northern peoples it has been assumed that northerners are more courageous and powerful, but, said Hume, it would be more accurate to say that the conquests had been made by poverty-stricken peoples upon the rich; for the Saracens had carried their conquests into the north with success. Still he fails to mention the battle of Tours.[14]

Finally, the only environmental theory which can carry any weight is the vulgar one which assigns to northern nations an excessive desire for strong drink, and to southerners an equal love of women. The physical causes offered to explain this effect are that liquor is needed to warm the blood in cold countries, and that the sun inflames the blood of southerners and excites the sex-passion. Still even these characteristics may be explained by moral causes. Wine may be prized in the north because of its rarity, and the warmth of the south which causes the people to go about half-naked may cause the jealousy and reserve prevalent in warm climates, which would inflame the sex-desire. Also, the leisure prevalent in warm climates because of the ease of satisfying wants, tends to increase this passion. It may again be observed that Hume has failed to state that all of these influences are, in the last analysis, purely physical causes. But, he says, even if we grant that physical causes do determine the predominance of love or drunkenness, still it may be held that they influence only the baser organs of the body and have little or no influence upon the mind.[15]

[14] Hume, op. cit. pp. 252–255.
[15] Ibid. pp. 256–258.

Such is Hume's refutation of environmental doctrine. It contains many elements of truth and suggestions of great value, but it is surely as one sided as any which was ever presented by an able representative of the opposite group. Even Montesquieu granted the influence of psychological factors upon the spread of customs, but Hume would admit almost no influence from physical causes. It is plain that Hume could not account for the origin of national or local characteristics, but could merely explain their diffusion. It remained for Buckle to offer the more reasonable explanation that in the earlier stages of human development physical causes were predominant and fixed the characteristics of every people, but that with the advance in civilization, mental laws and causes became ever more influential until in European history they had become the more important of the two.[16]

Romanticism was in its essence an emotional and idealistic reaction against the eighteenth century rationalism of Hume, Voltaire and others. The break was not clear-cut, however, for some of the earlier Romanticists, like Herder, are often classed as late members of the rationalist school. Likewise, Herder did not attack the environmental interpretation of social processes, but combined it in his scheme with the idea of national character. But as Romanticism developed it became less and less favorable to a considera-

[16] Buckle, op. cit. Vol. I, pp. 37, 112–113.
Says E. A. Ross: "Just as, on the higher levels of individual life, physical and physiological causes retreat in favor of psychic causes, so, on the higher levels of social life, geographic and racial factors lose in significance, and social destiny is shaped more by such bodies of organized experience as language, religion, morals, law, the arts and the sciences." *Foundations of Sociology*, p. 160.

tion of material factors and gradually developed into an almost wholly idealistic and emotional movement. In an oft quoted passage Hegel expressed himself as follows:—

> One never comes to me to speak of the climate of Greece since the Turks have come to dwell where formerly the Greeks dwelt. Climate should no longer be a question; I hope I shall not be annoyed by this question any more.[17]

The favorite explanation of social processes brought forward by the Romanticists was "National Character" or those innate and unique characteristics of each ethnic group alleged to issue in a distinct type of culture. Had the Romanticists carried their explanation back far enough to show how national character develops out of geographic surroundings and cultural history, a satisfactory philosophy of history and society might have been produced, but most members of this school were satisfied to do their theorizing in a circle, assigning culture to national character and national character to culture. Their emphasis on the importance of the unique character and genius of a nation prepared the way for a racial and chauvinistic interpretation of history.

2. *Charles Comte*

Charles Comte represents the transition in French anthropogeography from its crude beginnings with Bodin and Montesquieu to the more comprehensive discussions of

[17] Quoted by G. De Greef, *American Journal of Sociology*, Vol. IX, September 1903, pp. 254–255. Yet see Dunning, *Political Theories from Rousseau to Spencer*, p. 169, for evidence that Hegel assigned some importance to geography.

Reclus and Brunhes, and he made one of the most thoroughgoing attacks upon the uncritical and one-sided geographical interpretation of Montesquieu that has ever appeared.[18] It should be made clear, however, that Comte was not opposed to the geographical interpretation when broadly conceived and carefully presented,[19] and that his work opened the way for the synthetic analysis of Reclus as much as it destroyed the one-sided doctrines of Montesquieu. By insisting that all of the geographical influences on man must be considered and by allowing for their different effects upon man in varying stages of development, he laid the foundation for many of the conclusions of present-day critical anthropogeography.

Comte's primary aim was to give an "exposition of the general laws according to which peoples advance, retrogress, or remain stationary" and he believed that this necessitated the following method of approach:— (1) to introduce into the study of morals and legislation the scientific method which had brought so much progress in the natural sciences; (2) to study facts instead of inventing systems of interpretation; (3) to apply to the study of

[18] François Charles Louis Comte, *Traité de législation ou exposition des lois générales suivant lesquelles les peuples prospèrent, dépérissent ou restent stationnaires*, Paris, 1826.

[19] "But while Comte thus justly criticised Montesquieu, he himself exaggerated the efficiency of physical agencies. Indeed, he virtually traced to their operation the whole development of history. And this he could not consistently avoid doing. Having assumed that human nature was essentially sensation conditioned by organisation, and, consequently, essentially passive, he could not logically avoid holding also that the development of human nature and the evolution of human society have been absolutely determined by the factors which modify the bodily organisation and act on the bodily senses of men. Accordingly he has assumed that physical agencies ultimately account for historical change and movement, for public institutions and laws." R. Flint, *History of the Philosophy of History in France, French Belgium and Switzerland*, 1894, pp. 577–8.

morals and legislation the knowledge made available by the new natural science and the political revolutions of 1789–1820; (4) to lead young men to study the subject seriously rather than to be satisfied with the conventional rhetoric which prevailed in the contemporary philosophy of history; (5) to give to this important subject the same careful thought as had already been given to much less significant topics.[20] In order to carry out this program he held that it was necessary to apply the analytical method and draw freely upon other sciences.[21]

Neither the atmosphere nor the climate have any appreciable effect upon the pigmentation of the races according to Comte.[22] As to their influences on character he held that the white race preserves its psychic traits in all climates. Though the African negroes who inhabit the temperate zone of South Africa ought to be most like the white race of all the African negroes, such is not the case, for the Kaffirs of the torrid zone more closely resemble the white race. Moreover, the matter cannot be accurately settled on an environmental basis, for the situation is complicated by the mobility of mankind and the constant movement and intermixture of races.[23]

After this general statement of his position Comte offers a critical analysis of Montesquieu's theories. He points out the persistence of Montesquieu's theory of the direct relation between national character and climatic influences, and he claims that this notion has come down from Hippocrates to Bodin, from Bodin to Chardin, from Chardin to

[20] Comte, op. cit. Vol. I, pp. 29–30.
[21] Ibid. pp. 31 ff.
[22] Ibid. Vol. II, pp. 72–75.
[23] Ibid. Vol. II, pp. 95 ff.

Montesquieu, and from Montesquieu to early nineteenth century writers.[24] He contends that Montesquieu's source of information was Chardin, who often added to the data gathered on his travels accounts drawn from secondary and very unreliable sources.[25] Montesquieu added to Chardin's data his own investigation of the effect of hot and cold temperatures on the tongue of a sheep. On this foundation he erected a philosophy of history and jurisprudence.[26] Comte gives a very fair and concise exposition of Montesquieu's position and then proceeds to a critical analysis.[27] He finds the following defects in Montesquieu's procedure. The reasoning is too meagre and the explanations too simple. Montesquieu began by imagining a system of interpretation and then proceeded to an indiscriminate search for any kind of evidence to support his doctrines without trying to see if there was in reality any logical connection of cause and effect. He failed to square his doctrines with the well-established facts of history. Nor did he establish scientific limits to the three great climatic zones which he used so continuously in his theorizing. He often described as being in different zones countries which were in the same latitude though in remote longitudes. He failed also to fully comprehend the fact that climate is not merely a matter of latitude but is modified by many topographical features, such as elevation, water and forests. Also, one must distinguish between cultural influences and purely environmental forces which affect national characteristics. For

[24] Ibid. Vol. II, p. 119.
[25] Ibid.
[26] Ibid. pp. Vol. II, 120–121.
[27] Ibid. Vol. II, pp. 121–4, 126–8.

example, a poor man in Paris is much more affected by the winter's cold than a rich man in Russia.[28] As to the physical effects of climate Comte asserts that, according to Montesquieu, the Eskimos ought to be very large in stature and the peoples further south relatively much smaller. This is not so, however. The Eskimos are small physically, while the Indians around the Gulf of Mexico are very large and powerful. So are the Caribs who dwell near the equator. Not only in America but everywhere else do the actual facts tend to refute Montesquieu's idea that stature is directly correlated with latitude.[29]

Comte then examines Montesquieu's theory of an alleged correlation between intellectual traits and climate. In America warm climates have not been an obstacle to the development of high art and civilization, as is proved by the example of Peru and Mexico. Nor does civilization improve as one goes north or south from the equator, but rather it seems that the highest civilizations of the native Americans were located in the warmer climates.[30] Passing from America to an examination of other parts of the world he finds that as a general rule the highest civilizations have developed in the tropics.[31] As to Montesquieu's assertion that climate is the cause of cultural stagnation Comte asks why a climate that blocks further development permitted the origin of a particular culture.[32]

Comte also considers Montesquieu's assertion that cli-

[28] Comte, op. cit. Vol. II, pp. 124, 133.
[29] Ibid. Vol. II, pp. 134 ff.
[30] Ibid. Vol. II, pp. 176 ff.
[31] Ibid. Vol. II, pp. 207 ff., 225-6, 245-6, 255-6.
[32] Ibid. Vol. II. p. 255.

mate is the dominating factor in determining the ethics of a nation. Montesquieu had held that all vices, except drunkenness, were centred in the hot climates, and that the rugged virtues were found among peoples in the colder zones. He asserts that this doctrine was never based on any carefully tabulated observation.[33] Looking at the native peoples of America he finds that morals were not better in the colder climates, but rather the situation was generally just the opposite. Those in the cold climates were often distinguished by a greater degree of rapacity, cruelty, dishonesty, drunkenness, improvidence and pride.[34] The same is true of those who dwell on the islands of the Pacific, of the inhabitants of Asia, Africa and Europe.[35] He concludes, therefore, that the facts establish just the opposite of Montesquieu's notion, namely, that physically, culturally, and morally the peoples of the world have been most highly developed in the tropics and have declined in these respects in proportion as their habitat has been remote from the equator.[36] Thus Comte appears as one of the first to take the position later adhered to by Guyot, Spencer and others that civilizations had their highest original development in tropical climates.

Comte's position with regard to environmental influences is much more comprehensive than that of Montesquieu. He holds that one must consider the relation between the distribution of peoples and natural resources, the effect of the soil, the direction and nature of the rivers, the position of bodies of water, the nature of the tempera-

[33] Ibid. Vol. II, pp. 259 ff.
[34] Ibid. Vol. II, pp. 268–358.
[35] Ibid. Vol. II, pp. 359 ff. Vol. III, pp. 1–226.
[36] Ibid. Vol. III, pp. 227–240.

ture and the quality of the atmosphere. He names six factors which must be analyzed with regard to their influence upon culture. These are: (1) the configuration and exposure of the soil, (2) latitude, (3) elevation, (4) the neighboring and internal waters, including the rivers and the directions in which they flow, (5) the temperature and atmosphere, and (6) the seasonal distribution, particularly any variations in the latter.[37] Not only does Comte thus specify the main environmental factors analyzed by the great modern anthropogeographers such as Ratzel, Reclus, Brunhes, and Semple, but he also looks upon the question from the sociological and historical point of view. He asserts that the effect of these various factors cannot be looked upon in the absolute sense but must be analyzed in the light of the level of civilization reached by a given people. Also, he takes the point of view of Durkheim and other sociologists that those environmental factors which make for density of population are of special significance, for the greater the density, other things being equal, the higher the civilization.[38]

Comte made a comparative survey of the world in accordance with his scheme of investigation and concluded that it is impossible to determine exactly the scientific differences between the various types of men. The idealistic explanation of these differences is as inadequate as Montesquieu's one-sided environmental explanation. Cultural superiority is not wholly a matter of race for an inferior people will often reach a higher plane of development than a superior type because of a better environmental situ-

[37] Comte, op. cit. Vol. III, pp. 241 ff.
[38] Ibid. pp. 262–3.

ation. In other words, civilization is not only dependent upon the natural ability of a people but also upon what they are able to do in the particular physical environment in which destiny has placed them. A people may thus arrive at a high moral and industrial development through favorable surroundings even though the talents of each individual in the group have not been developed to their utmost capacity.[39] Finally, Comte anticipates Boas and other recent critics of the racial extremists by maintaining that it is impossible to assign any upward limit to the development of negro culture any more than to the possible development of the white race.[40]

3. *The Racialists*

The origin of the racial interpretation of society may probably be credited to Henry Home, known also as Lord Kames, a Scottish lawyer and philosopher. He held that man was created of different races so as to live best in different climates and he directly contradicted Buffon's notion that mankind was created one and was modified later by the influence of different environments.[41] In his criticisms of Buffon he endeavors to ascertain whether all of the inhabitants of the same climate are alike and finds that they are not. There is little difference in climate between Abyssinia and the Negro districts of Africa and yet there is an immense difference between the Negroes and Abyssinians in stature and complexion.[42] There are yellow

[39] Ibid. Vol. III, pp. 486–88.
[40] Ibid. pp. 487–488.
[41] Henry Home, *Sketches of the History of Man*, Edinburgh, 4 vols. 1778, Vol. I, pp. 20 ff., 73, 75–6.
[42] Ibid. pp. 25–6.

men in polar zones and in torrid zones, while the Finns and Norwegians live in the same climate as the Laplanders but are of different complexion.[43] The Moguls retain their original culture in India after four centuries and white peoples have persisted for centuries without change in tropical climates.[44] Kames also opposes the idea of Vitruvius, Vegetius and Montesquieu that climate has caused great changes in mankind and defends his contention that the races were originally created to fit their environment.[45] He sums up by saying, "It is my firm conviction that neither temper nor talents have much dependence on climate."[46] He gets around the biblical story of one original race by holding that mankind was created as one in Adam but was changed and diversified at the Tower of Babel so that he could live in different regions of the earth.[47] Kames and Buffon thus support the polygenist and monogenist positions respectively and they represent the environmental controversy as it stood a century and a quarter ago. They sum up the views and general spirit of their times very much as the discussions between Huntington and Goldenweiser represent the modern aspects of the controversy.

The racial point of view reached its peak in Gobineau's famous essay on *The Inequality of Human Races,* published in 1854.[48] Rejecting the geographical notion of cultural development Gobineau offered in its place the theory of an

[43] Home, op. cit. pp. 26–8.
[44] Ibid. pp. 28–30.
[45] Ibid. pp. 50 ff.
[46] Ibid. p. 67.
[47] Ibid. pp. 75–9.
[48] English translation of this work by A. Collins, Putnams, 1915.

original difference between the various races both as to physical type and mental capacity. The white race is superior to all others in beauty, strength, endurance and courage, in intellectual capacity and in moral stamina.[49] Only in the development of the senses is the white race inferior to the others, but this is really a type of superiority, for the white race is therefore less tempted and absorbed by "considerations of the body" and has more time and inclination for mental activity.[50] Any intermixture of the white race with an inferior race produces a deterioration in the white race.[51] Within the white race the Aryan "race" is far superior to all others. Of the seven great old world civilizations at least six were produced by Aryan stocks. Today "there is no true civilization among the European peoples where the Aryan branch is not predominant."[52] While modern ethnography rejects the view of Gobineau as to racial superiority and the existence of a distinct and supreme Aryan race, his work was widely read and did not a little to stimulate the chauvinistic political philosophy of present-day Europe.[53] It was in 1835 that Bopp in his *Comparative Grammar* revealed the relationships that exist among the various languages of Europe and Asia. Max Müller declared in 1861 that there is an Aryan race as well as a stock Aryan language. In 1871 J. G. Cuno pointed out that there could be no assumption of identity between race and language and thereby raised the question as to

[49] Gobineau, op. cit. passim, especially pp. 151-2, 204–7.
[50] Ibid. p. 207.
[51] Ibid. pp. 209–11.
[52] Ibid. pp. 210, 211, 212.
[53] For a good discussion of the "Aryan controversy" see Ripley, *The Races of Europe*, chap. xvii. A good critical exposition of Gobineau's doctrines is to be found in the *Contemporary Review*. Vol, 104, pp. 94–103.

who were the original and *bona fide* Aryans among the European peoples. Every nation tried to prove itself the descendants of the original Aryans, and the controversy, utterly lacking in scientific merit, might have been merely amusing had it not been a real force in supplying an emotional basis for the patriotic frenzy that preceded the Great War.[54]

A good illustration of the extremes to which the racial interpretation may be carried is found in the work of a Germanized Scotchman, Houston Stewart Chamberlain.[55] This writer assumes the inherent political and cultural superiority of the Teutonic race. By definition only a Teuton could produce a great political structure or work of art, and therefore all who have achieved eminence along these lines must be assumed to be Teutons, whatever our earlier misconceptions may have been concerning their ethnic qualities. In his list of great men he names such eminent Teutons as St. Paul, Dante, Giotto and Michelangelo. In view of the evidence that some of these great figures were not pure Teutons, Chamberlain is forced to surrender the strictly anthropometric criteria of race and to hold that psychic traits are probably the most important characteristics of a race. Once this is done, a great man may be assumed to be a member of "the great race." Thus the racial philosophy of history reaches its *reductio ad absurdum.*

Among recent books advancing the thesis of a racial hierarchy none has provoked more discussion than Madison

[54] See T. Simar, *Etude critique sur la formation de la doctrine des races*, Brussels, 1922. This book contains an admirable summary of the history of racial doctrines.

[55] *The Foundations of the Nineteenth Century*, translated by John Lees, London, 1911.

Grant's *The Passing of the Great Race.*[56] Grant's doctrines are, in general, the same as those of Gobineau, though there is considerable alteration of terminology and nomenclature. He believes in the superiority of the white man as firmly as did the great French racialist, but is more specific in designating the Nordic blonds of the Baltic area as that branch of the white race which excels all others in strength, wisdom, and virtue. These Nordics, preëminent in state building and military capacity, are gradually being extinguished in the competition with Mediterraneans, Alpines and Mongolians, and their passing betokens the decline of the white race as a whole.[57]

Grant assigns little importance to the influence of environment upon mankind.[58] Yet, in reality his differences with the environmentalists appear to be differences of degree and of definition, for one need not search far in his book for ample evidence of a belief in certain types of environmental influences. He holds, for example, that "the adjustment of each race to its own peculiar habitat is based on thousands of years of rigid selection which cannot be safely ignored," and that "as soon as a group of men migrate to new surroundings, climatic, social, or industrial, a new form of selection arises." This new form of selection takes place when the Nordics invade the habitat of the Mediterraneans, and one is tempted to ask if the process may not be reversed when Italians move into the Baltic area.[59] Further on, speaking of the evolution of the Nordics

[56] New York, 1916. The revised edition of 1919 is used here.

[57] For a trenchant review of Grant's work see Franz Boas in *The New Republic*, Vol. IX, Jan. 13, 1917, pp. 305–7.

[58] Ibid. p. 16.

[59] Ibid. p. 93.

through adaptation to environment, he asserts that "the climatic conditions must have been such as to impose a rigid elimination of defectives through the agency of hard winters and the necessity of industry and foresight" and that an area such as the Baltic region conforms to these requirements.[60] It was, therefore, "the isolation and exacting climate of the north" that produced the vigorous Nordic blond.[61] If this be true, may we not look for more of the great race in the future from the same region? Grant's gloomy foreboding seems hardly justified unless, perchance, the Baltic area has lost its secret.

Even if one were to reject the view of Boas and others that there is no necessary correlation between differences of race and variations of culture, the facts of history are obviously opposed to Grant's particular racial hypothesis. All of the earlier civilizations were non-Nordic in their racial foundations—Egypt, Mesopotamia, Persia, Syria, Phœnicia, Greece and Rome. Likewise, most writers would accord France cultural supremacy during medieval and early modern times, and her racial composition is primarily non-Nordic. The old hypothesis of a Nordic England is now greatly weakened, and even the German Empire consisted of about as many non-Nordic as Nordic elements. The most purely Nordic area in Europe, Scandinavia, is not warmly championed by Grant, as it has never been distinguished for war and political expansion.[62]

Grant's racial theory has attracted a wide following. Lothrop Stoddard gave it prominence in his somewhat

[60] Grant, op. cit. p. 170.

[61] Ibid. p. 172.

[62] This Nordic blond hypothesis was upheld with somewhat greater moderation by Vacher de Lapouge in his *Les sélections sociales.*

alarmist volume, *The Rising Tide of Color;* more extreme applications of the thesis appear in C. S. Burr's *America's Race Heritage* and C. W. Gould's *America, a Family Matter.* Even a scholarly psychologist like Brigham has adopted it in his *American Intelligence.* The most exaggerated of all works based upon the Grant hypothesis is H. J. Eckenrode's *Jefferson Davis: President of the South,* in which the author describes his book as "an effort to apply anthropological science to American history." In further indication of his attitude he remarks, "Madison Grant, in his great work, *The Passing of the Great Race,* has indicated the path; this volume makes the application." It is an effort to interpret the Civil War as a struggle between the majestic and superior Nordics south of Mason and Dixon's Line, of whom Jefferson Davis was a fine example, and the decadent and commercialized Nordics of the north, who surrendered their ideals of lordship and superiority for the sake of pecuniary gain, and were in time swallowed up by the non-Nordic immigrants. By destroying the Nordic ascendency in America the Civil War was a turning point in our history, with serious forebodings for the future of the country.[63]

4. *The Socialists*

The Marxian socialists cannot be classed among those who deny that the physical environment is a factor in social causation, but they are unalterably opposed to the theories of extremists who seek a direct correlation between

[63] See especially chaps. ii, iii, xvi. For a critical discussion of the whole subject see F. H. Hankins, "Race as a Factor in Political Theory," in C. E. Merriam and H. E. Barnes, *A History of Political Theories: Recent Times.*

certain geographic factors and definite social institutions and processes. Admitting that geographic factors have an influence upon human society, they insist that their operation is not so direct and simple as set forth by the geographic determinists. They contend that although geographic influences have their effect upon the industrial and economic life of a people, of far greater importance are the existing technology and the resulting economic institutions connected with the production, distribution and exchange of wealth. It is obvious that geographic factors will, to a considerable extent, determine whether a people carry on an agricultural, a manufacturing, or a commercial economy, but the physical environment cannot determine whether this economy will be one controlled by a few individuals or by a group as an economic democracy. A good statement of the socialistic philosophy is contained in the following paragraph from Engels' *Socialism Utopian and Scientific:*

The materialist conception of history starts from the proposition that the production of the means to support human life and, next to production, the exchange of things produced, is the basis of all social structure; that in every society that has appeared in history, the manner in which wealth is distributed and society divided into classes or orders, is dependent upon what is produced, how it is produced, and how the products are exchanged. From this point of view the final causes of all social changes and political revolutions are to be sought, not in men's brains, not in man's better insight into eternal truth and justice, but in changes in the modes of production and exchange. They are to be sought, not in the *philosophy,* but in the *economics* of each particular epoch.[64]

[64] p. 94. See article by Dr. Hansen in the *Quarterly Journal of Economics* for November, 1921, entitled "The Technological Interpretation of History." The materialistic interpretation of history, both geographical and socialistic, is summarized in E. R. A. Seligman's *Economic Interpretation of History.*

Geographic factors exert their primary influence upon the nature and mode of the production of wealth. The socialists take this fully into account, but they are much more concerned with the question of the ownership of the means of production and above all with the distribution of the reward for productive effort to the various classes in society. They contend that these factors, together with the prevailing technology, have much more to do with the development of culture and society than the mere physical facts of the environment. It is in this emphasis upon indirect causation and the significance of economic, rather than purely geographic, factors which separates the Marxian socialists from the exponents of pure geographic determinism.

5. *The Historical Anthropologists*

Unlike the classical group, the historical anthropologists, led by Professor Franz Boas, are not bound by any *a priori* theories of cultural evolution, but aim to discover what actually has been the development of civilization and social institutions, particularly among primitive peoples. They hold that an objective study of a large number of cultural areas must precede any attempt to discover and formulate the laws, if there are any, of cultural evolution. Among the more conspicuous members of the historical group who have given attention to a study of cultural development are Robert H. Lowie, Alexander A. Goldenweiser, Clark Wissler, and A. L. Kroeber.

In his *The Mind of Primitive Man,* Professor Boas dis-

A good account of Marx's philosophy is to be found in Kirkup's *History of Socialism.* Criticisms of Marxian theory are to be found in Veblen's *Place of Science in Modern Civilization;* Todd's *Theories of Social Progress;* and O. D. Skelton, *Socialism: A Critical Analysis.*

cusses the various theories that have been offered to explain the universality of cultural traits. Among such attempts has been that which lays emphasis chiefly upon the influence of the physical environment. At the outset he admits the general influence of the environment, not only upon certain forms of material culture, but also upon beliefs and customs. The environment furnishes the material out of which the primitive man shapes and develops, not merely the artifacts of daily life, but also the theories, beliefs and customs which grow out of his contact with his habitat. This view he sets forth in the following paragraph:—

It is not difficult to illustrate the important influence of geographical environment upon forms of inventions. The variety of habitations used by tribes of different areas offer an example of its influence. The snow house of the Eskimo, the bark wigwam of the Indian, the cave dwelling of the tribes of the desert, may serve as illustrations of the way in which protection against exposure is attained, in accordance with the available materials. Other examples may be found in the forms of more special inventions: as in the complex bows of the Eskimo, which seem to be due to the lack of long elastic material for bow-staves; and in the devices for securing elasticity of the bow where elastic wood is difficult to obtain, or where greater strength of the bow is required; and in the skin receptacles and baskets which often serve as substitutes for pottery among tribes without permanent habitation. We may also mention the dependence of the location of villages upon the food-supply, and of communication upon available trails or upon the facility of communication by water. Environmental influences appear in the territorial limits of certain tribes or peoples, as well as in the distribution and density of population. Even in the more complex forms of the mental life, the influence of environment may be found; as in nature myths explaining the activity of

volcanoes or the presence of curious land forms, or in beliefs and customs relating to the local characterization of the seasons.[65]

While granting these general influences of geographical factors Professor Boas sharply criticizes the one-sided notion that the same type of environment will, in a given stage of culture, produce the same results everywhere. It is obvious, of course, that the same environment will be met with greatly different reactions from peoples in different stages of culture, as is illustrated by the difference between the material culture of the American Indians and the European settlers on this continent, or between the cultures in England which were the product of Celtic, Roman, Anglo-Saxon, and Norman migrations. It may be more difficult to understand that similar or identical environmental factors will produce dissimilar cultures among peoples of the same level of development, but concrete examples prove this to be so. The Eskimos, in an Arctic environment, maintain life through hunting and fishing, while the Chukchee derive their support from the breeding of the reindeer. At the opposite extreme, in a semi-tropical environment, the Hottentot leads a pastoral life, while the Bushmen have retained their hunting economy.[66]

Cultural conditions, due in part to historical causes, are quite as effective, according to Professor Boas, as geographical factors. It frequently happens that customs which may have originated when the group dwelt in a quite different habitat have been perpetuated by cultural inertia after the group has moved and the older methods have

[65] Boas, op. cit. pp. 159–161.
[66] Ibid. p. 161.

thereby become out of adjustment and ineffective. Examples of this are the expensive and complicated tent of the Chukchee which has been carried over into a nomadic existence from the time when it was used as a permanent house on the coast, and the taboos on the use of the meats of various animals by the Eskimo. Though it is customary for the extremists on the opposite side to use these very facts in the defense of their position, insisting that the original adaptations perpetuated as survivals were themselves determined by earlier environmental conditions, Professor Boas refuses to admit the validity of their argument. In all periods the culture of any group is the product of the combined influence of the physical environment and the reaction of the human mind upon it. Therefore, it is evident that preceding as well as existing cultural conditions cannot be wholly assigned to the operation of geographical factors. Professor Boas expresses this idea thus:—

> We must remember, that, no matter how great an influence we may ascribe to environment, that influence can become active only by being exerted upon the mind; so that the characteristics of the mind enter into the resultant forms of social activity. It is just as little conceivable that mental life can be explained satisfactorily by environment alone, as that environment can be explained by the influence of the people upon nature, which, as we all know, has brought about changes of water-courses, the destruction of forests, and changes of fauna. In other words, it seems entirely arbitrary to disregard the part that psychical elements play in determining the forms of activities and beliefs which occur with great frequency all over the world.[67]

It is evident that Professor Boas is no one-sided critic of

[67] Boas, op. cit. pp. 163–164.

environmental theories like Hegel and Gobineau but that he is merely interested in determining the importance of environmental factors in cultural development and is willing to concede to them as much significance as can be shown to exist. In other words, his attitude, while critical of the extreme anthropogeographers, is merely that of a scientific student of the culture-environment problem.

Nowhere is the cautious scientific spirit of the historical anthropologists more clearly evidenced than in their attitude toward the general theory that the environment causes modifications in the bodily structure of man. A little over a decade ago, Professor Boas measured the heads and bodies of the offspring of a group of immigrants, and compared them with corresponding measurements of their parents.[68] He found appreciable differences between parents and children, and these differences varied according to the length of time the mother had been in the country before the birth of the child. The general tendency was toward an increase in the size of the body and head. Furthermore the cephalic index of the broad-headed types tended to decrease, and the long-headed types showed the opposite tendency.[69] In the presence of these startling facts Professor Boas remains imperturbed:

> I repeat that I have no solution to offer, that I have only stated the results of my observations and considered the plausibilities of various explanations that suggest themselves, none of which were found satisfactory. Let us await further evidence before committing ourselves to theories that cannot be proven.[70]

[68] "Changes in the Bodily Form of Descendants of Immigrants," Franz Boas. In the *American Anthropologist*, Vol. XIV, No. 3, July–Sept., 1912.
[69] Ibid. pp. 530–531.
[70] Ibid. p. 562.

Dr. Clark Wissler ventures to say more although he is likewise cautious about basing any generalizations upon the results of the Boas study. He has great faith in the possibilities of biochemistry and calls attention to our increasing knowledge of the ductless glands and internal secretions, which "raises the hope that we may soon be able to single out the specific compounds that control growth and function." For example, iodine is said to affect the secretions of the thyroid gland, and greater or less iodine in the environment might thus directly modify bodily stature. He cites also the example of the English sparrow, introduced into this country within the memory of people now living. The observed differences, both in size and plumage, between the sparrows on the Pacific coast and those on the Atlantic are no doubt attributable largely, if not entirely, to environment. Discussing the Boas study, he points to the "biochemical content of the new environment" as the probable cause of the observed differences in head and bodily structure. He asserts, however, that "this subject cannot be pursued with profit until more data are at hand."[71]

Dr. Robert H. Lowie, in his *Culture and Ethnology,* calls attention to the popular notion of geographic influences, which regards such influences as a matter of fact, directly observable, and not requiring any defense or analysis. These popular views are reflected in the notion that culture reaches its highest stage in temperate regions, that the dis-

[71] Clark Wissler, *Man and Culture,* 1923, pp. 314–317.
"In general it seems that the part played by the environment in the development of culture consists in deciding as to what may not become a part of human experience, but that among the experiences it makes possible is a wide range, in fact an almost infinite range, of yet to be discovered relationships among which are many that may enter into the culture of the future, if both the man and the hour come." Ibid. p. 320.

mal northern forests give rise to a crude and somber mythology, that liberty is directly correlated with altitude, and that those who inhabit islands are eminently and invariably accomplished in the arts of a seafaring life. In other words, this interpretation looks upon the human mind and culture as a plastic product shaped by the direct influence of external factors.[72] Dr. Lowie demonstrates that the matter is not so simple as this popular attitude seems to indicate.

Under the same geographical conditions, says Dr. Lowie, radically different cultures have prevailed, all of which seem to the superficial observer to be equally the outcome of a close adjustment to environment. An excellent illustration of this is afforded by comparing the Indian cultures of North America with the present-day civilization which has grown up under identical geographical surroundings. This shows that when we look upon cultural changes over long historic periods, often involving racial transformation, that either race, cultural technique, or both, are apparently much more influential than the geographical habitat.[73]

Dr. Lowie goes further and proceeds to show that identity of physical environment does not produce complete cultural similarity even among peoples in the same stage of development and often of the same or related racial stocks. For example, the Hopi and the Navajo Indians have both occupied for a long time a distinctive and highly similar environment in the southwestern part of the United States. In spite of this their cultures differ in marked degree. Even the few superficial resemblances have been shown to be due

[72] Lowie, op. cit. pp. 47–48.
[73] Ibid. pp. 48–49.

to social contact and cultural imitation rather than to a direct and similar response to environment. Almost as great differences may be discovered between the Bushmen and the Hottentots of South Africa, occupying practically the same geographical habitat, while cultural traits found among the Hottentots or the Bushmen are found also among the Bantus whose environment, though adjoining, is of a distinctly different character.[74]

Dr. Lowie further illustrates the weakness of the extreme geographical position by pointing out differences in the domestication of animals in various parts of the world. The natives of the new world are distinctly inferior in this regard. In the old world many animals are domesticated, while in the new only the llama and the alpaca had been utilized by man. The American Indian did not domesticate the buffalo as the Asiatics did various types of cattle, nor have the Eskimos domesticated the reindeer as have the Chukchee of northeastern Siberia. No satisfactory geographical explanation of these differences can be offered.[75] Again, while peoples in similar environments may have domesticated the same type of animals, the uses to which these animals have been put when domesticated often vary in a marked degree. For example, some tribes that have domesticated the reindeer use them both as food and for transportation, while others use them only for transportation, some of the latter riding them while others harness them to sledges. It is a singular fact, also, that although the ancient Chinese raised both sheep and goats in large numbers, they never used their wool for clothing until they were

[74] Lowie, op. cit. pp. 49–53.
[75] Ibid. pp. 53–55.

taught to do so in recent times by their neighbors. Even more interesting are the wide differences in the ways of utilizing cattle. The average European or American takes it for granted that cattle are everywhere maintained for both meat and dairy products. Strange as it may seem, however, many South African tribes, while utilizing the dairy products of their cattle, never slaughter them except for ceremonial purposes, while the people of eastern Asia maintain large herds for meat and leather but rarely make use of milk or milk products. These facts show that similar faunæ do not produce identical cultures.[76]

Many illustrations are offered by Dr. Lowie to show the importance of cultural forces as compared to geographic influences. For example, among many of the Indians of the northwest coast are found subterranean huts that are extremely warm even in winter. In a cold habitat these huts might be regarded as an adjustment to climatic conditions. It has been shown, however, that they have been adopted by tribes who live in an environment so warm that the huts are grotesquely out of keeping with surrounding conditions, while many northern neighbors, through the force of tradition and custom, have adhered to the much less satisfactory tent.[77] Further, it is true that an environment is unable to perpetuate cultural features which would seem essential to the mastery of the habitat. Dr. W. H. R. Rivers has pointed out the fact that natives of the Torres Straits, who once thoroughly understood the art of making and using canoes, have since lost the art and now rely upon utterly inadequate bamboo rafts, although no people in the

[76] Ibid. pp. 53–58.
[77] Ibid. pp. 58–59.

world would have a better geographical reason than the South Sea Islanders for retaining, and even perfecting, the use of boats. Dr. Lowie sums up his conclusions as follows:—

> Environment cannot explain culture because the identical environment is consistent with distinct cultures; because cultural traits persist from inertia in an unfavorable environment; because they do not develop where they would be of distinct advantage to a people; and because they may even disappear where one would least expect it on geographical principles.[78]

Dr. Lowie, however, does not contend that geographic factors have no effect upon cultural characteristics. He holds that certain gross environmental factors absolutely determine the limits within which definite cultural forms can exist and constitute the factors which exclude certain cultural traits from certain definite areas, as, for instance, the impossibility of the Eskimo developing a cocoanut culture or of the inhabitants of the East Indies dwelling in snow houses.[79] One can, moreover, assign something beyond a mere negative influence to environmental forces. In general, the environment furnishes the materials out of which the human mind molds an existing culture, but it cannot be said to determine absolutely what this culture will be. In every adaptation to environment the mind, as the active factor, is certainly as effective as the inert element of the environment. The whole subject of the relation of culture to environment is summarized by Dr. Lowie as follows:—

[78] Lowie, op. cit. p. 62.
[79] Ibid. pp. 62–63.

Altogether we may illustrate the relations of culture to environment by an analogy used by Dr. Wissler in another connection, which also brings us back to my initial analogy of the environmental theory with the associationist system in psychology. The environment furnishes the builders of cultural structures with brick and mortar but it does not furnish the architect's plan. As the illustrations cited clearly prove, there is a variety of ways in which the same materials can be put together, nay, there is always a range of choice as regards the materials themselves. The development of a particular architectural style and the selection of a special material from among an indefinite number of possible styles and materials are what characterize a given culture. Since geography permits more than a single adjustment to the same conditions, it cannot give the interpretation sought by the student of culture. Culture can no more be built up of environmental blocks than can consciousness out of isolated ideas; and as the association of ideas already implies the synthetizing faculty of consciousness, so the assemblage and use of environmental factors after a definite plan already implies the selective and synthetic agency of preëxisting or nascent culture.[80]

The views of Dr. A. A. Goldenweiser upon the relation of geographical factors to cultural development are contained in his article "Culture and Environment."[81] He calls attention to the antiquity of the problem, and to the wide acceptance of the extreme geographical position by every type of student of social science, from historians like Buckle and Myres, to students of geography such as Ratzel and Miss Semple. He indicates also that it is necessary to distinguish between the direct and immediate causes of cultural phenomena and their remote or antecedent

[80] Ibid. pp. 64–65.

[81] In the *American Journal of Sociology*, March 1916, pp. 628–633. See also *Early Civilization*, pp. 292–301.

causes. Further, he insists that no factor in causation can accurately be designated as a true cultural determinant unless it happens that the product is a result of the single and sole influence of the alleged determinant. It can be designated only as a co-determinant if more than this one factor is required to give rise to the cultural product under discussion.[82]

One of the most common assertions of the student of anthropogeography is that the material culture of a group is determined by the geographical habitat. Dr. Goldenweiser subjects this contention to a critical analysis in the light of certain ethnographic facts. The environmentalist holds, for example, that the snow house of the Eskimo is determined by the surrounding Arctic environment, while the elaborate wood industry and carving of the northwest coast Indians is ascribed to the presence of extensive cedar forests in that region. The weakness of this position is revealed by the fact that the Chukchee, who live in the same type of environment that the Eskimo inhabit, never erect snow houses, while the California Indians, surrounded by the most notable forests of North America, have practically no wood industry, and have devoted their artistic and industrial efforts mainly toward the making of baskets. Again, tribes, such as the Todas of southern India and the Dieri of Australia, make conspicuous use of materials carried a considerable distance from a different environment. This fact becomes even more prominent as civilization advances and improved transportation makes it possible for a group to draw upon the products of distant environments. Further, it is apparent that, though the same flora and

[82] Goldenweiser, loc. cit., pp. 628–629.

fauna might be utilized by two groups in an identical environment, the specific cultural forms might, nevertheless, be radically different. The environment may furnish the factors which are utilized in shaping a given material culture, but the way in which these things will be utilized depends very largely upon the cultural technique of the group. Hence, while a classification of tribal cultures on the basis of the materials utilized for food and industry might give a fairly complete notion of the flora and fauna of the different cultural areas, it would reveal little concerning the form or the psychological content of the cultures.[83]

Admitting that the environment may be altered by human effort, it is, nevertheless, true, according to Dr. Goldenweiser, that whereas the cultural factor is dynamic in character the environment is, in the main, static. While the cultures of great historic areas have undergone the most tremendous and far-reaching transformations, the physical environment within which this progress was achieved has varied but little. Miss Semple believes that this permanent and enduring character of the environment constitutes a valid reason for considering the geographical element supreme in cultural causation. This point of view is challenged by Dr. Goldenweiser who contends that "if the same environment conditions a continuous series of cultural transformations, or, to put it differently, a series of slightly different cultures, either the environment in its entirety is active all the time, and then some extra-environmental cause must account for the difference of effect, or different sides of the environment come into action at different periods, in which case some extra-environmental cause must determine

[83] Ibid. pp. 629–630.

the selection." [84] It must be clear that the use to which an environment will be put is chiefly dependent on the existing cultural technique. A river may be an obstacle separating primitive peoples, while at a later time, with the introduction of the arts of civilization, it may prove a highly important avenue of communication and all obstacles to transit may disappear by the erection of an imposing bridge. The method of cultivating a region whose geographic conditions have not changed varies widely from the crude Indian cultivation to the most advanced methods of modern agriculture with its extensive labor-saving machinery. The flora and fauna of an area may not be altered materially during centuries, but the change in the technique involved in utilizing them may completely transform their economic significance.[85]

The two most important psychic elements in cultural development are imitation and invention and they may lead to progress or conservatism. In either case culture is much more effective than environment. It is certain that the greatest inventors in every field have had their contributions shaped chiefly by standards and forms prevalent in their cultural environment. Equally if not more significant is the effect of culture upon the retention through imitation of traits prevalent in any given society. Though geographical isolation may prevent that contact which is the chief force in breaking down conservatism, it is nevertheless undoubtedly true that psychic inertia is the underlying cause of the persistence of cultural traits during long periods of time. The process of imitation and the particular culture

[84] Goldenweiser, loc. cit. p. 630.
[85] Ibid. pp. 630–631.

that is imitated are matters determined by psychic and cultural factors without any extensive influence from the environment. Finally, it must be remembered that all advanced cultures combine with indigenous traits many which have been borrowed from cultures that are wholly independent of the environment of the given group.[86] Dr. Goldenweiser sums up his position thus:—

> These brief remarks will suffice to indicate that a large set of environmental influences, while actual, are not significant for culture; that in another set of cultural phenomena culture and environment co-operate and must be regarded as codeterminants; that in two of its fundamental aspects, that of invention and that of imitation, culture is independent of environment; and that, finally, every culture is largely independent of its environment in so far as it is a historical complex.
>
> These considerations should not discourage us from studying the specific influences doubtless exerted by environment upon culture, but they might serve to emphasize the folly of any attempt to interpret any culture in terms of environment alone. Speaking with reservations, culture must be regarded as a closed and to a large extent self-sustaining system.[87]

A well balanced view of the environmental question is presented by R. R. Marett, the English anthropologist.[88] Agreeing that the facts of geography have an important bearing upon the problems of the anthropologist he becomes

[86] Ibid. pp. 631–632.

[87] Ibid. p. 633.

In his *Anthropology* Professor A. L. Kroeber devotes a brief section to a discussion of geographic influences. He takes the same general attitude as the rest of the historical group, holding that the "natural environment does impose certain *limiting conditions* on human life," but that "it does not *cause* inventions or institutions." Op. cit. pp. 181–2.

[88] *Anthropology*, New York, No. 37 in the Home University Library of Modern Knowledge.

exceedingly skeptical over the theories of anthropogeographers such as Ratzel, Le Play and Demolins, whose generalizations he calls "far too pretty to be true." If environment is everything, he asks, and man was impelled to tame the wild horses of the Asiatic steppes, why did not the American redskin tame the bison, and why have the inhabitants of Africa failed to utilize the elephant? Race, culture and intelligence, he contends, as well as environment, are factors which must be taken into account.[89]

A regional survey of the world, Marett argues, not only fails to establish any definite correlation between types of men and types of culture, but it reveals human history "as a bewildering series of interpenetrations." Geographical influences doubtless play a part, but man carries his accumulated experiences all over the world, using them to conquer new environments if they have proved effective in a former habitat. He thus is able "to compound environments—a process that ends by making the environment coextensive with the world." Marett here emphasizes the process of diffusion as over against local invention, in general agreement with the historical anthropologists. When we discover a group utilizing a product, peculiar to their environment, in its arts or industries, we are prone, he says, to assume a causal relationship between the two, and credit the local product with calling the art or the industry into existence. He doubts if this could be true, and cites numerous examples to show that cultural diffusion, even over wide areas, is a far more reasonable explanation. "We are all of us born imitators, but inventive genius is rare."[90]

[89] Marett, op. cit. pp. 97–100.
[90] Ibid. pp. 122–124.

Our conclusion, then, must be that the anthropologist, whilst constantly consulting his physical map of the world, must not suppose that by so doing he will be saved all further trouble. Geographical facts represent a passive condition, which life, something by its very nature active, obeys, yet in obeying conquers. We cannot get away from the fact that we are physically determined. Yet physical determinations have been surmounted by human nature in a way to which the rest of the animal world affords no parallel. Thus man, as the old saying has it, makes love all the year round. Seasonal changes of course affect him, yet he is no slave of the season. And so it is with the many other elements involved in the "geographic control." The "road," for instance—that is to say, any natural avenue of migration or communication, whether by land over bridges and through passes, or by sea between harbours and with trade-winds to swell the sails—takes a hand in the game of life, and one that holds many trumps; but so again does the non-geographical fact that your travelling-machine may be your pair of legs, or a horse, or a boat, or a railway, or an airship. Let us be moderate in all things, then, even in our references to the force of circumstances. Circumstances can unmake; but of themselves they never yet made man, nor any other form of life.[91]

6. *The Sociologists*

In his *Psychology of Peoples* Gustave Le Bon examines the influences which together have created the great historic races, among the most important of which he names the influence of the physical environment.[92] He maintains that the influence of the physical, as well as the social environment, in race formation is exerted chiefly upon racial stocks which from cross-breeding are in the process of formation. The intermixture of racial stocks tends to

[91] Ibid. pp. 128–9.
[92] Le Bon, op. cit., pp. 50–52.

break down the native characteristics of each race and to leave the product of their interbreeding extremely susceptible to any definite and long-continued set of geographical influences. When, however, these racial types have become fixed through long development the influence of the physical environment, upon their psychic characteristics at least, is scarcely noticeable. Therefore, as Buckle and others have called attention to the decreasing influence of the physical environment in proportion to the psychic and cultural development of peoples, so Le Bon contends that these influences become progressively less in proportion to the approximation of a race to a given physical and psychic type.[93]

In his discussion of social laws Professor E. A. Ross calls attention to the fact that a more detailed investigation of the sociological field since the time of Comte has

[93] LeBon, op. cit. pp. 55 ff.

"The influence of environment—physical or moral—is in consequence very great or very slight according to circumstances, and this is the explanation of the contrary opinions that have been formulated with regard to its action. We have just seen that this influence is very great on races in course of formation; but had we been considering ancient races solidly established by the long action of heredity, we could have said that the influence of environment is, on the contrary, almost inappreciable. As regards moral environment, we have proof of the insignificance of its action in the failure of our Western civilisations to influence the peoples of the East, even when these latter have been subjected to their contact during several generations; the Chinese inhabitants of the United States are a case in point. The slight power of physical environment is shown by the difficulties that attend acclimatisation. Transported into surroundings too different from those to which it is accustomed, an ancient race—and the statement is equally applicable to men, animals and plants—perishes sooner than to submit to transformation. Egypt has always been the tomb of the many different races that have effected its conquest. Not a single people has been able to acclimatise itself in the country. Neither Greeks, Romans, Persians, Arabs, nor Turks have been able to leave behind them a trace of their race. The only type that is met with is that of the impassible Fellah whose features exactly resemble those engraved seven thousand years ago on the tombs and palaces of the Pharaohs by the Egyptian artists." Ibid. pp. 55–57.

shown that social development, in its larger aspects, neither responds solely to the stimulus of mental factors, nor follows the same pattern among all peoples, but is modified by the effect of the physical and social environment which operates in each case.[94] On the other hand, though one must recognize the reality of environmental influences, the analysis of such factors must proceed with care and it is generally recognized that the attempts of earlier theorists like Guyot, Draper and Buckle to characterize in a single formula the typical geographical factors of a whole continent were extremely crude, if not approaching the grotesque.[95] Further, it must be perceived that even a detailed study of the physical environment cannot furnish an adequate theory of social causation, for many of the social processes which are frequently regarded as closely dependent upon geographical influences can be shown to rest to a very large degree upon human volition, embracing especially the element of purpose:—

> Most of the instances, however, that form the stock-in-trade of the environment school do not support their case at all. Migrations and colonizations, the territorial distribution of population, the distribution of labor among the various occupations, the investment of capital, the location of cities, the lines of communication, and the currents of trade, have human volitions as their proximate causes, and not the features of the physical environment. The ground for so bold an assertion is the neglected distinction between the factors of a telic event and the factors of the volition that brings about the event. . . . Now, the local distribution of immigrants in a region can and should be explained in terms of purpose. It is only when, pressing further back, we undertake to

[94] Ross, *Foundations of Sociology*, p. 61.
[95] Ibid. p. 79.

account for their purposes that we come upon considerations relating to climate, soil, water, timber, and the like. Similarly, a railway net has all its causes in the volitions of the men who had it built. The topography of the country enters into the case only as affecting the motives that determine these volitions. It is a dim recognition of this distinction that leads most writers to speak of the physical environment as "influence" rather than cause. Undoubtedly men's choices are conditioned and their projects limited by the physical framework they live in. *Mesology* or the study of the influence of the environment will always be a fascinating chapter in our science. Still, since the external facts are foreseen and taken into account in intelligent telic action, it is necessary to regard social phenomena as essentially psychic, and to look for their immediate causes in mind.[96]

Professor Ross is likewise moderate and discriminating when he discusses the effects of a change of environment upon a people. If the new environment is similar to that of the mother-country the civilization and institutions of the new society will ultimately tend to resemble those of the mother-country, though during the period of colonial development distinct factors would come into play which were not in existence in the society from which the colonists came. If, however, the migration was to a radically different type of physical environment, the civilization and institutions of the colonists would come to differ radically from those of the land of their origin. But even here "the chief transforming factor is not Climate or Aspect of Nature working directly on people, but radical change of occupation, working first on habits and ideas, and then on social relationships and institutions."[97]

[96] Ross, op. cit. pp. 151–152.
[97] Ibid. pp. 225–226.

In examining the problem of the relation of the individual organism, especially the human organism, to its environment in the widest sense of the term, Professor Ellwood rejects the view that the behavior of an organism is determined solely by the stimuli which operate upon it from its external surroundings. The organism selects from the great diversity of stimuli a few upon which it reacts, and through the evolution of its mind employs a continually more intelligent selection, until it becomes progressively more and more the master of its environment. Thus the environment and the organism evolve together, both being modified by their interaction.[98] But their influence is usually negative rather than positive.

In discussing various theories of social progress Professor Ellwood analyzes the anthropogeographical interpretation. After pointing out the views of writers like Buckle, Semple, Huntington and Woodruff, he presents his own ideas somewhat briefly. He contends that the geographic theories are usually over-simplified and do not allow for the operation of the many diverse factors producing social progress. The development and decline of the great historic civilizations have shown no definite correlation with environmental conditions and changes. While it is an undoubted fact that the physical environment exerts a far greater influence upon social evolution in its earlier periods than it does later, and that this influence is important, it is after all a very incomplete formula for explaining the totality of social progress:—

[98] Ellwood, *Introduction to Social Psychology*, pp. 287–290.

That favorable conditions, and also crises, in man's natural physical environment do play a part in his social development, there can be no doubt, and we have tried to point out briefly, but carefully, just what their part is in the social process. But the anthropogeographical theory of progress is too simple to show all of the active factors at work in social progress. If it were an adequate explanation, it is not unfair to say that the geographical conditions should make progressive societies out of hordes of apes, or even herds of lower animals. Progressive social evolution does not always take place when physical conditions are favorable, nor have the most favorable physical conditions, in the past, prevented social retrogression. The civilization of Greece and Rome went down, but their geographic conditions did not appreciably alter. The geographical determinists in general have failed to show any definite and certain connection between changes in climatic and geographic conditions and well known historical progressive and retrogressive social changes. In the early history of human society, however, the dependence of progressive change upon geographic conditions is more marked, and, as we have already pointed out, both favorable conditions and crises in the physical environment have certainly played a large part as stimuli in developing human civilization. The natural physical environment is, of course, the framework within which man's social evolution has taken place, and there can be no doubt that through selection, habituation and stimulation, it has been a very large factor in social evolution; but in itself, it is quite inadequate to explain social progress.[99]

In an article on "Theories of Cultural Evolution," in the *American Journal of Sociology* for May, 1918, Professor Ellwood exhibits a close acquaintance with the more recent theories of the critical anthropologists, and shows himself to be in essential sympathy with their views. Especially does he call attention to the theory of Dr. Goldenweiser

[99] Ellwood, op. cit. pp. 293–294.

that the environment is not the creative factor in cultural evolution because it is a wholly static influence while culture is essentially dynamic in its nature.[100]

Professor C. H. Cooley distinguishes three possible ways of viewing the problem of cultural causation—the materialistic, the idealistic, and the organic or synthetic.[101] According to the materialistic view, historical development is produced primarily by physical factors, while the psychic aspects are secondary or derivative. He regards the materialistic interpretation of history as a very fruitful field of investigation, but dissents radically from the notion that it can fully account for the development of human culture. He maintains that a satisfactory theory of social causation should be as much concerned with showing how material results grow out of idealistic causes as with illustrating the manner in which ideals arise from material factors.[102] He is no more inclined to look upon the idealistic interpretation as complete in itself, but indicates that he is not wholly in sympathy with the present tendency to look with contempt upon the idealistic point of view and stress the significance of the materialistic approach.[103] Over against both of these incomplete interpretations, Professor Cooley would set what he calls "the organic view of history." In this he aims at a synthetic view of the historical process which seeks not to give primary importance to any set of factors, but rather to ascertain the way in which all have contributed to produce a given cultural situation.

[100] Ellwood, loc. cit. pp. 784–786.
[101] *Publications of the American Economic Association*, Third Series, Vol. V, No. 2, pp. 182–187.
[102] Cooley, loc. cit. pp. 182–184.
[103] Ibid. p. 184.

The essence of the theory is set forth by Professor Cooley in the following words:

The organic view of history denies that any factor or factors are more ultimate than others. Indeed it denies that the so-called factors—such as the mind, the various institutions, the physical environment, and so on—have any real existence apart from a total life in which all share in the same way that the members of the body share in the life of the animal organism. It looks upon mind and matter, soil, climate, flora, fauna, thought, language and institutions as aspects of a single rounded whole, one total growth. We may concentrate attention upon some one of these things, but this concentration should never go so far as to overlook the subordination of each to the whole, or to conceive one as precedent to others.

One who holds this view is not content to inquire whether the economic interpretation of history is the fundamental one. Back of that, he thinks, is the question whether there is, in fact, such a thing as a fundamental interpretation of history, in the sense that one aspect of society is in its nature more ultimate than others; whether life actually proceeds in a one-two-three manner, and not, rather, in a total manner, each special phase of it at any given time being derived not merely from some other special phase but from the total condition of mankind in the preceding epoch He believes that life, go back as far as you will, is a progressive transformation of a whole in which the ideal, institutional and material phases are coördinate and inseparable.

History is not like a tangled skein which you may straighten out by getting hold of the right end and following it with sufficient persistence. It has no straightness, no merely lineal continuity, in its nature. It is a living thing, to be known by sharing its life, very much as you know a person.

In the organic world, that is to say in real life, each function is a center from which causes radiate and to which they converge; all is alike cause and effect; there is no logical primacy, no in-

dependent variable, no place where the thread begins. As in the fable of the belly and the members, each is dependent upon all the others. You must see the whole or you do not truly see anything.[104]

In his *Introduction to the Study of Sociology,* Professor Edward Cary Hayes recognizes that fundamental geographic factors such as differences in temperature, elevation, humidity and topography have a substantial and obvious influence upon the life of man, and that the food available in a given environment does much to determine the size of the population which may exist there. He holds, however, that the geographic theory of social causation is an incomplete and exaggerated view of the process.[105] The physical environment, after all, is only one of several influences affecting social activity, and no more explains its development "than one substance, which the chemist mixes with others in a retort to secure a complex reaction, explains the total effect." Moreover, geographic influences become less and less powerful as man gradually becomes the master of his habitat. Improved methods of transportation and intercommunication free him from its domination, and "thus the relative importance of geographic causes diminishes as civilization advances, while the technic and social factors steadily increase in importance." [106]

In his *Theories of Social Progress,* Professor A. J. Todd discusses the theories of the geographical determinists at considerable length. Admitting that climate has some ef-

[104] Cooley, loc. cit. pp. 185–186.
[105] Op. cit. pp. 29–41.
[106] Ibid, pp. 39–40.

fect upon human activity, such as the fact that no child is born in Cerro de Pasco, Peru, at an altitude of 14,200 feet, that hens do not lay there, and that pure bred dogs cannot live, he becomes very skeptical when weather is held accountable for increases in crime, for acute mental disturbances among the insane, or for good and bad behavior in public schools. It may be, he points out, that crimes against the person are not due to the direct action of heat but to the greater contact of person with person permitted in more open weather. Also, perhaps, cold does not make a thief but merely makes the want of food more keen during the winter months. In such cases the direct causes are social, with temperature only a conditioning phenomenon.[107] He is likewise dubious about geographical environment determining racial traits. With Huntington's assertion that Japan's type of man has been selected by a stormy climate, with Miss Semple's statement that a cold climate puts a steadying hand on the human heart and brain and with Montesquieu's dictum that heat affects courage and relaxes body and mind, he has little patience. Nor has he any confidence in Buckle's assertion that heat produces lazy men and that cold, beyond a certain degree, will have the same effect. Buckle's conclusion that Sweden and Norway, Spain and Portugal, though otherwise different, are remarkable for a certain fickleness of character, Todd holds to be absurd, for the Swedes and Norwegians are anything but fickle and many Portuguese show industry and thrift.

To the assertion that tropical heat makes food easy to

[107] Todd, op. cit. pp. 158–159.

get and requires less clothing for man, and that this ease of maintaining life tends to overpopulate a country, resulting in too many laborers, low wages, great differences in wealth, and despotism, Todd opposes the fact that China is not a tropical country, yet is a stock example of all these things. Furthermore, wealth is scarcely more unequally divided in India than in the United States, yet no one would attribute the American situation to high temperature.[108] In answer to the contention that a warm climate inclines to a worship of the past and that hot countries are static, according to Montesquieu, he again suggests China as the stumbling block. Monotony of climate, isolation or taboos upon intercourse with strangers are more likely than high temperature to produce a static life.[109] To disprove Montesquieu's assertion that rude climates make for barbarity and mild climates for tenderness, Todd calls attention to the suttee in mild India, which was abolished by the Englishman from his rude climate. The rigor of laws and penalties is not an affair of geography but of culture-history.[110]

Moreover, Todd points to names immortal in the realm of imagination such as Homer, Socrates, Plato, Cæsar, Dante, Shakespeare, Molière, Goethe, Poe, Ibsen, and Tolstoi to prove that imagination is not a matter of isotherms. India developed a richly imaginative mythology—so did the Norsemen. The environment permits but does not confer the results. One is reminded, he says, of Hegel's

[108] Ibid. p. 161.
[109] Ibid. pp. 161–162.
[110] Ibid. pp. 162–163.

statement that the Turks now live where the Greeks once dwelt.[111] The only connection, however, between climate, geography, and religion comes from the fact that religion is a practical aid in the solution of such problems as food, health, sex, order and safety. The great founders of religion came from the Orient because civilization had early reached a higher level there.[112]

To Ellsworth Huntington's theory that climate, especially increasing aridity, is the great determinant of race movements, wars, and barbarian invasions, Todd replies that no searching examination of the theory has been made, and no large body of evidence brought to light to prove the assertion. When the facts are known, he thinks that pressure of population and other human factors will be found to be more important than temperature and rainfall.[113] As to the influence of the soil, he is again skeptical. He points out that soil, fertility and other great natural resources everywhere have given an opportunity for, but cannot produce or maintain, a high civilization. " 'It is psychology, not soil or climate,' says Mr. Emerson, 'that enables a man to raise five times as many potatoes per acre as the average of his state.' "[114]

Speaking of the effect of topography, Todd is also inclined to sound a word of caution. The mountains of Greece and Switzerland are said to elevate the souls of their inhabitants, but he thinks that a certain bovine contentment that goes with cow-bells and cheese, rather than

[111] Todd, op. cit. pp. 163–164.
[112] Ibid. pp. 164–165.
[113] Ibid. pp. 166–167.
[114] Ibid. pp. 167–168.

the dramatic patriotism of William Tell, characterizes Switzerland. Most of the conservatism and clannishness found among mountaineers is due, he holds, to the natural isolation of mountainous regions, and modern transportation and frequent contact with strangers tend to obliterate these primitive effects of topography. The whole question of topographical determinism is rapidly waning.[115]

In summarizing, Todd holds that if we attempt to evaluate the influence of geographic determinants, we discover that climate and soil may dominate man at first. But only at first while intelligence and culture are rudimentary does this happen. As soon as mental capital is stored up, human groups begin to lay up stores of food, tools, seeds, in other words, capital, which free them from the grip of seasonal vicissitudes. Waterfalls could only become a force in social and economic life when intelligence showed the possibilities hidden in them. Falls were present in aboriginal days but they did not help the American Indian because he saw no meaning in them. Hence intelligence and the education of intelligence are necessary before cultural determinism can operate with fullest power. Man unites with his fellows to dominate his environment. He tames the earth by taming himself. The whole matter is preëminently an educational process and it was only because educational forces were once more or less unconscious and unformulated that geographic environment could ever have played so considerable a role as a conditioning factor in human life. It is thus plain that Todd admits more than he appeared to admit at the outset, and

[115] Ibid. pp. 169–170.

his difference with Buckle and others who assert that man gradually gains control over his environment is, after all, largely a matter of degree. His quarrel seems to be chiefly with the environmental extremists.[116]

[116] Todd, op. cit. pp. 174–175.

CHAPTER XII

SUMMARY

THE preceding chapters have, in addition to the views of certain outstanding critics of geographic determinism, dealt briefly with the leading theories of the more important contributors to anthropogeography from Hippocrates to the present. Limitations of space have prevented the inclusion of all the important writers of this extensive period, but it is hoped that a sufficiently discriminating selection has been made to give the reader a reasonably clear conception of the origin and development of environmental theory. If the author has achieved his purpose, the student of political and social theory can readily perceive the gulf that separates Huntington from Hippocrates.

Several of the theories discussed have stood the test of ages, enduring in some instances with little alteration from ancient times to the present. That the peoples of the middle latitudes, or temperate zones, are superior to their brethren both to the north and to the south; that man needs opposition from his environment to bring out the best that is in him; that there has been an orderly progressive shifting of the center of highest civilization throughout the course of history; that geographic factors are more important in primitive society and that with the advance of civilization the importance of psychological and cultural

factors increases; and that isolation and accessibility are correlated with cultural growth and diversification, are views which have been expressed by writers of various nationalities, experiences and walks of life, under a variety of historical and cultural circumstances. Whatever scientific validity these theories may or may not possess they have shown a vitality which entitles them to more than passing consideration.

A belief in the all-round superiority of the peoples of the middle latitudes was one of the most persistent of ancient times. On this point there was complete agreement, but grave differences arose over the exact location of these middle latitudes. Aristotle drew the line of racial and cultural superiority through Greece; Vitruvius, Pliny and Vegetius through Rome; Khaldun through Arabia; and Bodin through France. Aquinas, in the thirteenth century, dutifully repeats the ethnocentric tradition, and it is reiterated a few centuries later by Humboldt and Ferguson. The idea that the temperate zones are most conducive to the development of civilization persists also in the works of more recent writers, and the line of cultural superiority continues to exhibit its migratory tendencies. Ratzel was convinced that the peoples of the temperate zone have proved superior in a political and military, as well as in a cultural sense, but he was inclined to draw his line of superiority through the colder portion of that zone. Buckle and Spencer took the same general position, although Spencer insisted that civilizations originated in hot climates. Guyot offered a most eloquent statement of the advantages of the temperate zone for physical and social evolution; and Robert DeC. Ward holds that temperate regions owe their

preëminence to stimulating climate and to seasonal changes which develop forethought and thrift. After painstaking research, Huntington found that the climate most favorable to human progress is one having winters that are frosty, but not too cold, summers that are warm, but not too hot, and a constant succession of storms—the climate of the United States, England and Germany. Finally, J. Russell Smith names the great cities of the world's most important nations, and it is of interest to note that the average latitude, both mean and median, of the nineteen cities he mentions is almost exactly 45° north.

From Hippocrates' theory that man in order to be vigorous and brave needs a climate which will ruffle the temper and demand fortitude and exertion, to J. Russell Smith's laconic assertion that "civilization is a product of adversity," the thought that man needs opposition and a struggle to bring out the best that is in him has found expression in the writings of all time. It is implied in Strabo's theory that barren regions tend to develop fighters, and the converse appears in the dictum of Herodotus that "soft countries give birth to soft men." Ferguson's statement that "men do more when they have certain difficulties to surmount than when they have supposed blessings to enjoy" is perhaps the most eloquent expression of the same view. Humboldt asserts that it was the inhabitants of the temperate zone who overcame obstacles of various kinds and carried civilization to the tropics, while Kidd regards as a sacred *duty* the control and development of the tropics by civilized peoples. Ratzel adds his testimony to the value of a struggle against adverse conditions, and Treitschke's assertion that a mild climate and fertile soil fail to bring

out the best that is in people is in line with the same general theory. Buckle, also, suggests the converse when he says that bountiful regions do not develop energy in man. Reclus holds that the environment must supply enough obstacles to stimulate effort, but not enough to discourage the people. The need of opposition is voiced also by Guyot, Robert DeC. Ward and Huntington in their discussions of the value of seasonal changes, with alternating periods of plenty and scarcity, which compel man to struggle but give him a rich reward for his pains. They find in this compulsion the essence of all human progress.

As a statement of a simple truth, Guyot's conception of a progressive shifting of the center of highest civilization is obviously in line with the facts of history. It is when causes are assigned to account for this shifting that differences of opinion begin to appear. Guyot did little more than state the fact of an orderly "march" of the center of highest culture in a northerly and northwesterly direction. Lester F. Ward linked the idea with his theory of "sympodial" development without stressing the geographic element. Herbert Spencer found a *cause* in man's increasing knowledge which enabled him to conquer more and more difficult environments and move steadily away from the tropics into the colder regions of the north. Robert DeC. Ward accepts the Spencerian view and adds that the increasingly difficult environments have tended, also, to bring out the best that is in man. GilFillan concludes that the progress of civilization has been *coldward* because lower temperatures are conducive to that mental efficiency upon which the higher civilizations depend. Huntington contends that each of the great civilizations had about the same

climate when its culture was at its peak and that the climate north of the equator is growing warmer. All of these writers except Huntington carry their centers of civilization forward into colder and colder environments. Huntington carefully selects his ideal climate and takes it with him.

However men differ regarding the importance of geographical factors in social causation, they seem to agree that their operation is most effective upon primitive peoples and that advancing civilization is characterized by a diminishing importance of physical influences and an increasing importance of psychological and cultural factors. Credit for this view is conventionally assigned to Buckle, but as we have already observed, the doctrine was clearly foreshadowed by Montesquieu and Humboldt, and definitely formulated by Ritter before the *History of Civilization* made its appearance. The idea was reiterated by Spencer and later by Robert DeC. Ward, Thomas, Ellwood, Hayes, Todd and others. It was repeated, also, by Lester F. Ward who described the process as a transition from the unconscious stage of social evolution into the advanced and conscious stage which he termed "collective telesis." Fairgrieve considers the doctrine at some length in his discussion of changing geographical controls and the idea is perhaps most lucidly set forth by E. A. Ross. Kirchhoff, though he admits the growth of man's power over nature, raises a dissenting voice. He differs from Buckle and others in his insistence that even today geographical influences are more important in human society than psychological and cultural influences.

That accessibility and its opposite, isolation, invariably

affect people for better or for worse is an ancient doctrine whose prestige has increased during recent times. Earlier writers such as Strabo, Cæsar, Cicero, and Aquinas considered a location on the sea undesirable because it corrupted good morals, stimulated luxury, and produced an over-refinement of manners; on the other hand, they deemed bravery and ruggedness of character the products of isolation. Beginning with Montesquieu, who stressed the urbanity and broadening effects of accessible environments, writers have been inclined to favor accessibility and to point out the shortcomings of isolated peoples. Ritter, Peschel, Reclus, Ripley and Giddings have dwelt upon the political and cultural backwardness that accompanies isolation, and the progress and enlightenment which result from the contact of many cultures, while the most prominent feature of the Ratzel-Semple system is its emphasis upon these indirect effects of geographical factors.

Recent intimations of an extra-terrestrial interpretation of human affairs have, in addition to stimulating the popular imagination, aroused a wide interest among men of science. While this new interest has none of the enticing absurdity of the old judicial astrology, it curiously reminds us of some of the conclusions set forth by the astrologers when their weird and fantastic explanations are not revealed. The parallel ends there, however, as the new hypotheses are being developed on strictly scientific lines, and the pioneer work of Jevons and his predecessors, the tentative opinions of Leffingwell and the researches of men like Huntington and Moore have indicated possibilities in this fascinating field of study.

It is obvious that modern geographic theories are far

more varied and broadly conceived than those of earlier times. The factors considered today include not only climate, location and natural resources, but sun-spots, climatic oscillations and weather changes. Ancient writers, for the most part, looked upon environmental influences as direct and immediate—operating on the individual. In modern theories indirect effects receive the greatest emphasis and less attention is given than formerly to influences which are simple and direct. The environment is regarded as helping to create the cultural situations to which man adjusts himself. The works of such contemporary writers as Huntington and Dexter who emphasize the direct effects of climate and the weather, and of Strabo, the ancient Greek, who stressed the indirect effects of the physical surroundings, may be cited as exceptions to the general rule, but in the main it is true that earlier theories regarded environmental influences as simple and direct, while today they are for the most part looked upon as indirect and secondary.

It is evident, also, that the environmental doctrines of the future will be based mainly upon scientific research, as carried on by men like Huntington, Robert DeC. Ward and Henry L. Moore, rather than upon philosophical speculation and the repetition of ancient traditions, except insofar as the truth of these traditions is demonstrable in the light of modern science. Present-day anthropogeographers have a vast amount of scientific and technical knowledge at their disposal which was not available to earlier writers. This includes general advances in the fields of astronomy, meteorology and biochemistry, improved methods of statistical procedure, greater information regarding lands and

peoples all over the world, and devices for the accurate measurement of temperature, humidity and atmospheric pressure. They have the advantage, also, of a lengthened historical perspective and greater familiarity with what man has actually achieved in the way of mastering nature, which better equip them to discuss the modifications of geographical influences which follow changes in civilization and the general development of human culture.

Modern social scientists, as a rule, are coming to regard geographic factors more as conditioning influences than as determinants, and to hold that man and culture, primarily, are the dynamic and determining factors. In Lowie's words, "The environment furnishes the builders of cultural structures with brick and mortar but it does not furnish the architect's plan." This view is set forth in substance and with varying degrees of emphasis in the works of many modern and contemporary writers, and it forms the very essence of the objections raised by the historical anthropologists to the doctrine of geographic determinism.

That social causation is the scientific description and evaluation of *all* the factors which condition and determine the collective life of man is the position taken by most of the sociologists, who regard the social process as a unity and look upon the geographical factor as constituting only one element in that process. The anthropogeographer of the future will need to adopt this comprehensive view of social causation if he is to discover the true relation of geographic factors to human society. But it will equally devolve upon the sociologist to acquaint himself with the extremely important and varied field of causative and conditioning factors in social evolution which is being more and

more adequately and discriminatingly cultivated by the anthropogeographer. As Ratzel contended, it is not a matter of "man versus nature but of man and nature evolving together through reciprocal influences"; and every historical situation must be examined in the light of its geographical setting, while all geographical influences must be studied in the light of their changing incidence and importance with the developments and vicissitudes of culture.

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