WHAT HAS HAPPENED TO PHYSICAL GEOGRAPHY?

JOHN LEIGHLY

University of California, Berkeley

Dedicated to the Memory of R D CALKINS
April 20, 1873—September 27, 1955

At the time when the Association of American Geographers was founded, physical geography was the most prominent part of earth-lore in instruction and in the writings that were labeled "geography." The meaning given to the term "physical geography" had, it is true, been modified in the preceding fifteen years, almost entirely through the efforts of the founder of the Association, William Morris Davis. A decade earlier Davis had imposed on all but one of his fellow-members of the sub-committee on geography of the Committee of Ten on Secondary School Studies his then novel conception of its content.

Before about 1890 there was no evident disagreement about what physical geography was. The most succinct definition given in the textbooks is Russell Hinman's of 1888: "Physical geography seeks to trace the operation of the laws of nature upon the earth; upon the air, the water, and the land; upon plants, animals, and even upon man." This definition, except for the reference to man, was one that Humboldt would have subscribed to. Its derivation was clear: it could be traced back through Humboldt, Bergman, and Lulofs to Varenius; and from Varenius to the encyclopedic writers of the Middle Ages, who built on Aristotle.

The notion of physical geography embodied in the recommendations made to the Committee of Ten in 1893 differed from Hinman's only in giving primacy to the surface of the lands, in the spirit of Davis's concepts, over the atmosphere and the oceans. This "curious and persistent insistence on the peculiar claims of physiography" was one of the points at which the dissident Houston directed his opposition. But the spirit of the study of the earth that Davis recommended for secondary schools was the same as the one that animated the instruction in physical geography at Harvard in which he had participated for twenty years, the same that Hinman had expressed. That is to say, the earth was approached from the viewpoint of the physical and natural sciences; it was studied in its own terms and for its own sake.

1 National Education Association, Report of the Committee of Ten on Secondary School Studies (New York, 1894), pp. 204-240. The lone dissenter was Edwin J. Houston.

The textbook by Davis's student R. S. Tarr that was published two years later is written in the same spirit.

**PHYSICAL GEOGRAPHY UNDER DAVIS'S DOMINION**

But at some time in the middle of the eighteen-nineties Davis shifted from this position, in which the earth is studied on its own account, to the one he retained to the end of his life. The earliest record of this shift I have found was published in 1897, but must have been written no later than early 1896. Here Davis presents, as one of the goals of public instruction, the imparting of “a clear understanding of the manner in which our mode of living is related to the earth on which we live. . . . From the time of the first occupation of the State its people have been constantly influenced . . . by the geographical features that they observed about them. . . . The pupils should therefore be led . . . to perceive the character of the various geographical influences by which settlement, occupation, etc., have been determined.” The duality of the content of geography that Davis asserted so frequently in his later writings appears distinctly in a statement made in 1897, in which he appeals to the memory of Ritter and Guyot and to the contemporary Ratzel in support of a definition of geography as “the study of the earth in relation to man.” His definition of “one part of geography, which is coming to be called physiography,” sounds the note that was long to echo in geographic writings: “everything about land, ocean and atmosphere that constitutes an element of man’s environment is . . . a subject for physiographic study.”

It is a tribute to Davis’s industry and persistence that this curiously oblique motivation of the investigation of a great class of natural phenomena was accepted, apparently without serious questioning. It dominates Davis’s own textbook published in 1896, as it does the books written by others but modeled after his. It is appealed to in the great books written for use in the universities by R. D. Salisbury and R. S. Tarr. In these great manuals, motivation by an appeal to geography as concerned “with the distribution and associations of life (including human industries) as affected by physical conditions” (Salisbury) or “with the influence of the surface features [of the earth] on human and other life, and the interaction and interrelation between air, water, land, and life” (Tarr) was superfluous. Both books contain statements about the influence or relations of physical features on or

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3 Elementary Physical Geography (New York, 1896).
6 Davis, assisted by William Henry Snyder, Physical Geography (Boston, 1898).
7 Only one needs to be cited: Charles R. Dryer, Lessons in Physical Geography (New York, 1901).
8 Rollin D. Salisbury, Physiography (New York, 1907, 1919); Ralph Stockman Tarr, College Physiography (New York, 1914), published under the editorial supervision of Lawrence Martin.
with human life and economy, better and fuller in Tarr than in Salisbury. But these statements are uttered merely in passing; the overwhelming bulk of both books is devoted to the straightforward discussion of the physical features of the earth, precisely as if these were being investigated for their own sake.

It can scarcely be supposed that the uncritical references to "influences" or "relations" written into the books published in the first two decades of this century were any more satisfactory to their authors than they are to us today. What gives them their gratuitous quality is that before 1890 the physical earth could be discussed without self-consciousness, without any appeal to its supposed "influences" on human affairs. It is only in the United States, to the best of my knowledge, that geographers have not felt free to investigate the physical features of the earth's surface without looking anxiously over their shoulders to see whether these features affect human beings in some way.

I can offer no explanation why Davis set the example of insisting that the earth's physical features, though they were to be investigated according to the same general methods as other natural phenomena, should be looked upon, not as in themselves appropriate objects of scientific inquiry, but as the objects of one of the two divisions he saw in geography, for one of which he accepted Huxley's term "physiography" in a distorted sense, and for the other invented his stillborn term "ontography." There can be little doubt, however, that he implanted in American geography the anxiety about what geography is that has not only spawned numerous definitions, but has also hampered straightforward work in physical geography.

It is well known that in his original work Davis paid little attention to the limitations that in his theoretical utterances he imposed on physical geography. Occasionally, in fact, he expressed the impatience I have displayed here: "... it is not altogether clear why geographers are so generally content to leave to geologists all treatment of matters so eminently physiographic as the weathering of rocks, the wasting of soils, the transportation of land waste by streams, the abrasion of land margins by the waves. If these activities had occurred only in the remote past, geologists alone might lay claim to them; but, as a matter of fact, they are all part of the very living present." 9 It was under Davis's stimulation that work in physical geography became a self-evident task of candidates for advanced degrees. Moreover, he was a strong advocate of studies of regions. As early as 1894 he urged that monographs on the individual states be written under the auspices of the state geological surveys. 10 The first such work, on Missouri, was by his student Marbut; 11 but the Davisian ideal was probably more closely approached by the younger Cleveland Abbe's memoir on Maryland. 12 In his old age Davis recalled

these writings and others of the same class to the members of the Association, but they have been largely overlooked, as has also his elaborate treatise on the description of regions published in 1915. Though in his programmatic writings Davis made physical geography no more than one member of an ill-matched pair, by his original work and his guidance of students he maintained for it an independent place in science.

**DAVIS’S YOUNGER CONTEMPORARIES**

When in 1924 Davis reviewed the progress of American geography, his view of geography in general, except for the assertion that the description of regions is its ultimate goal, was the same as he had urged two decades earlier. Though he did not realize the fact, he was speaking to a generation that knew him not. The theoretical structure of geography he had built up at the turn of the century had become obsolete. Probably his best exposition of that structure was published in 1902: “Let it then be here agreed that the whole content of geography is the study of the relation of the earth and its inhabitants. We thus see two prime divisions of the subject. One includes all the physical environment of life; the other all those responses which life has made to the environment... It is the element of relationship between the physical environment and the environed organism, between physiography and ontography... that constitutes the essential principle of geography today.”

By way of defining what he meant by “establishment of relations,” Davis was wont to use an expression borrowed from Arnold Guyot: “rising to the causes and descending to the consequences.” In what he considered the essential relations in geography, this meant rising to the physical causes and descending to the organic consequences of terrestrial phenomena. For him, as for most nineteenth-century rationalists, the “organic” included the psychologic and social as well as the physiologic. Davis’s theory of the intellectual function of geography thus rested on the presumption of an unbroken chain of causation linking the physical phenomena of the earth’s surface, the organic realm, and human society. This monistic and mechanistic interpretation has deep roots in Western thought, but acquired special emphasis in the late nineteenth-century through the extension of the Darwinian concept of evolution through natural selection to the intellectual and social realm. Davis, like his teacher N. S. Shaler, but within a narrower intellectual frame, repeatedly confessed the “evolutionary” basis of his thought.

It is ironic that precisely in the years when Davis was maturing at Harvard a group of thinkers at the same institution was tearing down the intellectual structure that Herbert Spencer and the social Darwinists had erected. By the turn of the

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century, when Davis's influence was rising to its peak, mechanical, monistic interpretation was outdated in psychology, anthropology, and economics. It was rendered obsolete by the recognition that in human societies processes of an order different from the mechanical order are at work, processes that cannot be comprehended even by the categories applicable to organic phenomena. Those who were remaking psychology, economics, and anthropology, warned by the errors into which mechanical interpretations had led, were cautious. They proceeded empirically and were reluctant to generalize.

This is not the place for comment on the anomaly that environmentalism burgeoned in American geography at a time when specialized students of cultural phenomena had abandoned it. But it is necessary to note the consequences for physical geography of the attrition of the environmentalistic dogma. That such an unlikely effect supervened resulted from the original assertion of a causal concatenation between the physical and the cultural. When the link of assumed causation between these sets of incommensurable phenomena was finally recognized as being hopelessly weak, the two halves of Davis's structure of geography fell apart, and the two sets of phenomena toward which it was directed retained only their empirical association in space. But the concatenation assumed earlier had a lasting effect through the selection of the individuals who were to carry American geography into its post-Davisian stage. To uncritical minds the linkage of physical cause with cultural effect offered an explanation of cultural phenomena, which were included in the body of facts at the end of the Davisian chain of causation. The impression that geography offered an explanation of matters relating to human beings attracted to it more adherents with a primary interest in finding explanations of historical events than with a curiosity about the physical earth. The copious writings of Miss Semple, for example, whose interests lay wholly within the "human" part of Davis's "ontography," attracted many who would have been repelled by the soberer investigations a Davis or a Salisbury pursued in his original work.

The change in character of the papers read at the meetings of the Association of American Geographers during the first twenty years of its existence has often been remarked upon. It consisted, of course, in a progressive concentration of attention on "human" affairs, accompanied by at least a relative reduction in the number of papers dealing with the physical earth. Programs of the meetings show that this change was scarcely if at all a result of change in the interests of the original members, who continued to report on matters they had always been interested in. The significant change was in the identity of the persons who read papers: an increase in the number of academic instructors in geography at the expense of persons engaged in various fields of investigation concerned with the earth but not self-conscious geographers, whom Davis's hospitable conception of the membership appropriate to the Association had attracted to it. These new participants customarily laid their offerings on the altar variously inscribed on its several faces: "control," "influence," "adjustment," and "relation."
It was mainly academic geographers who contributed the answers cited by G. B. Roorbach in his report of 1914 on the results of an inquiry concerning "the three most important problems that need solution, or the three most important lines of investigation that need to be followed, in the subject of geography." Only two out of 29 whose replies Roorbach reported, W. W. Atwood and N. M. Fenneman, listed problems in physical geography. The task most frequently cited was a more explicit formulation of "geographic influences" than was available. The majority of Roorbach's correspondents had gone far beyond Davis's definition of only a decade earlier. They had moved from Davis's position at the node between physical and organic facts, from which one might follow the physical facts back to their causes and forward to their consequences. They had taken a position much farther down the stream of causation, and were interested only in tracing cultural facts back to their physical causes, back to the node that in Davis's mind was the home base of the geographer.

In their relation to the future, several of the replies Roorbach's inquiry elicited attract attention by "[placing] investigations on regional geography among the most important." In answers written from Chicago appear expressions that later were to become familiar: "comparative studies of different regions" (Tower); "type studies," "standardize methods of investigation and of writing" (Barrows). These expressions, Davis's exposition of regional description published in the following year but written in 1913, and Fenneman's presidential address of 1918, "The Circumference of Geography," heralded the new definitions that were to appear after the interlude of the first world war. Fenneman's interpretation of the content of geography was more generous than was to be heard in most comparable utterances in the future. It was left to his successors to draw the circumference of geography with a radius so small as to exclude parts of geography, such as geomorphology and climatology, that lay within that circumference as he drew it.

NEW DEFINITIONS IN THE TWENTIES

Environmentalism was not abandoned completely until the late nineteen-twenties, but it was in retreat through most of that decade. The first of the new definitions of geography to attract attention was the one H. H. Barrows gave in his presidential address of 1922. His title was innocent enough; for at least fifteen years geography had been defined in ecologic terms, and Barrows was probably not far wrong in ascribing to American geographers a definition of "their subject as dealing solely with the mutual relations between man and his natural environment." One might question some of these words: "solely," for example, and "mutual"; Roorbach's correspondents had not been quite unanimous, and a long
time had passed since any geographer had said much about man's effect on the earth. The term “ecology” had become familiar at about the beginning of the century, and it was inevitable that someone would apply it to the relations claimed by so many geographers as their particular concern. J. P. Goode had so applied it in 1907, describing a course given at Chicago as “essentially an elementary course in plant, animal and human ecology.” But what concerns us is the content that Barrows gave the term “human ecology” as a synonym for “geography.” His definition is perhaps the most drastic example in our literature of definition by exclusion. He disposed of the components of physical geography one by one, concluding thus: “In short, geography treated as human ecology will not cling to the peripheral specialisms to which reference has been made—to physiography, climatology, plant ecology, and animal ecology—but will relinquish them gladly to geology, meteorology, botany, and zoology, or to careers as independent sciences.”

Barrows not only shortened the radius of the circumference Fenneman drew about geography; he also shifted its center. His circumference is drawn eccentrically in Fenneman’s figure, so as to exclude “physiography” (that is, geomorphology), climatology, and biogeography, but to include some “systematic” constituents, namely, economic, political, and a potential social geography.

In the perspective of thirty-odd years Barrows’ proposals can be seen to be closely related to what had preceded them. He conceived the earth as “environment” rather than as an entity worthy of attention for its own sake. Moreover, he confessed an all but absolute economic determinism, operating in the true mechanical spirit of social Darwinism: “I believe that . . . upon economic geography for the most part the other divisions of the subject must be based” (p. 13).

Carl Sauer’s programmatic statement of the following year shows the same eccentricity in relation to Fenneman’s circumference as Barrows’ definition. But he recognized that the “social sciences” had abandoned their search for “laws.” Their “a priori principles,” he wrote, “are being discarded under a recently developed agnosticism. . . . They are relying now upon the historical method of tracing the growth of institutions, on statistical correlations and their interpretation, and even introducing various survey methods.” Sauer thus rejected definitely the hypothesis of mechanical causation in human affairs that had so long afflicted American geographic thought. The positive proposals he made were probably too inclusive an application of experience gained in a special situation—the situation that gave rise to the Michigan Land Economic Survey—but they had a

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21 R. S. Tarr, in his Elementary Physical Geography, had included a chapter “Man and Nature,” the title of which echoed that of George Perkins Marsh’s great work, and the first part of which dealt with man’s modification of nature.


23 Barrows thought, however, that knowledge of these fields was “an indispensible prerequisite to successful geographic work.”

prodigious influence in the following years, providing a pattern for innumerable studies of small areas. Physical geography, which Sauer distinguished sharply from "physiography," was basic to his program. It is selective, "selecting those items that represent the background and the medium of human activities, as it were, the human habitat" (p. 27). But physical features are to be classified genetically if possible. The "facts of occupation," the elements of the cultural landscape, are to be ordered according to the ethnic origin of the inhabitants and the history of settlement. The principle that comprehension of phenomena is to be sought in terms of the phenomena themselves was thus respected in Sauer's "survey method," though the method and its purposes were anthropocentric.

In his "Morphology of Landscape"25 Sauer rejected the rational interpretation of physical forms. He could not "relinquish," as Barrows had, the investigation of land forms and climate, soils and vegetation, since to him the object of inquiry was not an abstract "relation," but the material landscape. He retained title to them, instead, by dividing the lore of land forms and of the atmosphere into two phases, one empirical and the other rational. Thus he was able to claim for geography an empirical physical geography as opposed to a rational "physiography" in Huxley's sense.

After this theoretical preparation, the description of "regions" became, in the nineteen-thirties, the standard kind of geographic writing in the United States. But we did not achieve the substantial monographs of the French and German type that had been held up as examples. Davis's students had come closer to that ideal a generation earlier. Instead, Sauer's suggestion that "perhaps a township, or a county, is a better field for testing research ability in geography than a state or a great region"26 was accepted with blind literalness; the mapping of the two phases of the land surface in a small area became the typical academic specimen of aspirants to degrees in geography. The elaborate intellectual structure set forth in "The Morphology of Landscape" was degraded to the bare bones of the existing economy of small regions. Most American geographers succumbed to what the late Harold Innis called "the obsession with the immediate."27 I am speaking here of the innumerable accounts of "regions" turned out according to a perfunctory scheme that demanded no more than a moderate amount of diligence. Programmatic utterances made a place for "systematic" inquiries concerning the physical earth, provided these acknowledged their subservience to regional description, as twenty-five years earlier they had been forced into a subordinate place as expositions of environmental controls.

Two generations of American geographers thus renounced what in the latter part of the nineteenth century had seemed their most obvious task. The motivation of this renunciation is obscure; but its method, the selection of disciples and suc-

26 "Survey Method," op. cit., p. 32.
cessors by influential personalities in American geography, is fairly clear. Its characteristic manifesto was the restrictive definition of geography.

THE CONTEMPORARY SITUATION

Fortunately, practice never quite fulfills the expectations of prescription. Despite the efforts of those who would reduce the investigation of the surface of the earth to a barren inventory of its commercially valuable resources and the marks of their exploitation, an intellectual concern with the traditional content of geography for its own sake has persisted among us. It is a hopeful sign that one of our best publishing houses has issued an expensively produced textbook bearing the simple title “Physical Geography,” whose author frankly invokes the great books by Salisbury and Tarr as his models.

Much of Davisian geomorphology had become stale and unprofitable before its author’s death. But the multitudinous forms of the land surface remain, as accessible to new insights as to Davis’s. Investigation of them has lagged. The literature of theoretical and experimental hydrology abounds in suggestions that have never been taken out of the hydraulic laboratory and applied to the surface of the land. More has been learned in the last twelve years about the behavior of surface waves in water than by earlier investigators since Newton; but no one has systematically walked the shores of our seas and lakes seeking to apply these theoretical and experimental results to the forms exhibited there.

With respect to the atmosphere we have been more fortunate, since climatology has not been completely divorced from a rational meteorology. If in the last quarter-century a gap has yawned between geographers and meteorologists it is not because of ignorance on the geographic side that the meteorologists were remaking their science, but of unwillingness to learn the rigorous language the meteorologists use. Such indolence exposes us to the indignity Werner Baum has inflicted upon us by making an invidious distinction between “meteorological” and “geographical” climatologists. We forfeit our claim to respect if we accept that distinction, or admit, as has recently been done, that what the meteorologists write is “beyond the intellectual reach of the geographer.” What they write about is our concern, from the transfer of heat and water vapor at the earth’s surface to the systole and diastole of the westerlies.

If our physical geography is to become something more than elementary instruction in matters that are not normal objects of investigation by the instructors, the shackles that have long hampered us must be struck off. I mean restrictive definitions, first imposed by William Morris Davis. I venture the guess that one reason why our colleagues in other countries have found satisfactory work in physi-