

THE CONTRIBUTIONS OF WILLIAM MORRIS DAVIS
TO GEOGRAPHY IN AMERICA

by

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PREVIEW

PREFACE

Before anyone can attain to the highest esteem of his contemporaries in any line of academic endeavor, he must ~~make~~ contributions of a quality so high, that in comparison they stand out above those made by others in the same field. He may create something entirely new. He may utilize or interpret the findings of others so that the whole field of interest is seen in a new perspective. Or he may stimulate others to make original contributions, which perchance may extend the horizon of investigation far beyond that contemplated by the individual himself.

In this study the writer has endeavored to discover the basis for the high esteem in which William Morris Davis is held by geographers and others all over the world. The major purpose has been to discover what contributions Davis has made and what influence he has had on the growth of geography in America through its various stages of development. A minor purpose has been to prepare a bibliography of his important productions.

The literature consulted in this investigation includes both primary and secondary sources. Studies were made at the Library of Congress, the United States Geological Survey, libraries of the American Geographical Society, Columbia University, and the University of Chicago, and the

city libraries of New York and Chicago. These studies were supplemented by conference with a number of men who have had intimate association with Davis and his work. The manuscript in its tentative final form was submitted to Professor Davis for suggestions and criticisms.

The first active participation of William Morris Davis in the development of geography in America began nearly sixty years ago. Since 1875 he has had a part in every important movement for the improvement of geography either as a mature science or as an academic subject.

Davis systematized the study of land forms, and through the introduction of a large number of explanatory terms he provided the foundation for a technical vocabulary in physiography. He utilized the ideas of several geologists in formulating his theory of the cycle of erosion. He first worked out the theory on the postulates of normal conditions and then later expanded it to apply to special conditions. The theory of the cycle of erosion is his best-known single contribution.

Davis' multiple hypotheses method of field study, his explanatory methods of land form description, and his block-diagram methods of illustration are noteworthy among his achievements which have received widespread recognition. His essays on the history of geography, his biographical memoirs of prominent geographers, and his philosophical

treatises on the content of geography are evidence of his leadership in many phases of geographic thought.

He was a pioneer in the field of geography in education. He prepared text books in geography for the elementary field, chiefly because of his desire to promote sound teaching of the subject at all levels including those in which he himself was without classroom experience.

Some of his writings have been published in French, German, Italian, Spanish, and Japanese. He has taught in British, French, and German universities. Through various agencies his influence has permeated the whole field of geography in America and spread to every inhabited continent on the globe, thus justifying the title awarded to him by common consent--the dean of American geographers.

V. E. R.

Lincoln, Nebraska,
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To these and all others who gave various kinds of assistance, I gratefully acknowledge my indebtedness.

Vera Esta Rigdon

PART I

A BRIEF HISTORY OF GEOGRAPHY IN AMERICA BEFORE 1875

CHAPTER I

GEOGRAPHY IN AMERICA IMMEDIATELY PRIOR
TO THE TIME OF DAVIS' SCIENTIFIC ACTIVITY

Geography at the time of William Morris Davis' earliest productive work was dominated by two characteristics--a philosophy of distinctly European origin, and a great unorganized accumulation of geographical data which had been gathered in America in sciences other than that of geography. Through Guyot, a native of Switzerland, the philosophies of Humboldt and Ritter first found expression in higher education in America. The two last named men labored harmoniously but not unitedly for the advancement of physical geography. Alexander von Humboldt¹ (1769-1859), who was a specialist in many of the natural sciences, was a great traveler. After spending six years in the Americas collecting data, he spent more than three times as long in organizing and preparing his findings for publication. He used English, Italian, Spanish, and French with ease, but since his travels were made for the French government, most of his writings were published in French. Humboldt was one

1. Guyot, Arnold Henry: Alexander von Humboldt. Journal of the American Geographical and Statistical Society, Vol. 1, 1859, pp. 242-246.

of the first scientists to work out laws of plant distribution and reduce them to a system on the true foundation of climatology, which as a science was still in its infancy. Humboldt's use of isothermal lines with his studies of plant distribution soon accelerated progress in meteorology. His "Cosmos",¹ which he called his "physics of the world" is his most representative work. In it he placed the greatest emphasis upon the physical or material science of the earth.

Carl Ritter (1779-1859), whose interest in the social sciences is manifest in his "Erdkunde" (translated "geography of the earth"), supplemented Humboldt's more physical treatment.² Ritter's writings were based on the pre-

1. "Cosmos"; in German, "Ideen zur einer physischen Weltbeschreibung". Quoted from a letter from Humboldt to Louis Agassiz.--"Louis Agassiz, His Life and Correspondence" by Elizabeth Carey Agassiz, p. 316.

2. "Die Eigenthümlichkeit des Volks kann nur aus seinen Wesen erkannt werden, aus seinem Verhältnisz zu sich selbst zu seinem Gliedern, zu seinem Umgebungen, und weil kein Volk ohne Staat und Vaterland gedacht werden kann, aus seinem Verhältnisz zu beiden, und aus dem Verhältnisz von beiden zu Nachbar--Ländern und Nachbar Staaten.

"Hier zeigt sich der Einfluss den die Natur auf die Völker, und in einem noch weit höher Grade, als auf den einzelnen Menschen ausüben musz, weil gleichsant hier Massen auf Massen wirken, und die Persönlichkeit des Volkes über die des Menschen hervorragt.

"Dieser Einfluss ist anerkannt und vor jeher ein wichtiger Gegenstand und Untersuchung für Völker-Staats- und Menschen-Geschichte gewesen: auch in unsern Tagen

mise that each continent has its own peculiar character as surely as any person has, and that it is designed to fulfill a specific office in the culture of mankind. He organized details into complete unity bringing together the results of botany, geology, astronomy, chemistry, and philosophy so as to give the world his conception of geography, which embodied the active and constant presence of God. In writing of Ritter's geographical works, H. Bögekamp said that

"He would have geography be a brief statement of all divine laws, a revelation of God in nature and history to be used in instructing youth to see and to trace the manner of working which the Deity follows."¹

Ritter, himself a devout Christian and a teacher possessing the most kindly human interest in the youth with whom he came in contact, handed down to his students the philosophy that the earth was created for man as an expression of God's universal love for humanity.

Arnold Henry Guyot² (1807-1884) began his training in

ist er laut zur Sprache gekommen."--Ritter, Carl: Die Erdkunde, Erstes Buch, im Verhältnisz zur Natur und zur Geschichte des Menschen allgemeine oder vergleichende Geographie, pp. 2-3.

1. Bögekamp, H.: An Account of Ritter's Geographical Labors. William Leonhard Gage's translation of Carl Ritter's Geographical Studies, p. 51.
2. Libby, William: Arnold Henry Guyot. Bulletin of the American Geographical Society, Vol. 16, 1884, pp. 194-221.

theology but association with Alexander Braun and Louis Agassiz diverted his major interests from theology to the natural sciences. However, all through his academic career, he retained an interest in religion and philosophy--an interest fostered and encouraged by Carl Ritter. In addition to the professors already named Guyot was associated with other men representing different fields of endeavor. Some of these were Dove and Hoffman in meteorology, and Steffans and Boch in philosophy. He took up cultural subjects to give breadth to his training. It was while attending Boch's special lectures on philosophy and Grecian archaeology that he first met Humboldt and that their friendship began.

After spending several years as a private tutor he was appointed to a professorship in history and physical geography at the University of Neuchâtel. He accepted the position, not because he liked history, but because he found it necessary to teach history in order to retain physical geography. While at Neuchâtel, through his association with Agassiz, he became interested in glaciers in the Alps. Late in the decade of 1840-1850 the University of Neuchâtel was disbanded, and Guyot, thus forced to seek employment elsewhere, turned his attention to America. In 1849 through the influence of Agassiz he was invited to give a series of twelve lectures at Lowell Institute of

Boston. These lectures under the title of "Comparative Physical Geography in Its Relation to the History of Mankind", were largely an outgrowth of his previous work in history and physical geography at Neuchâtel. He delivered the lectures from notes, and later expanded and transcribed them into French. The manuscripts were then translated into English,¹ and later published as Guyot's classic work, "Earth and Man".

The Lowell Institute was a connecting link between academic geography in Europe and that in America. In 1842 Humboldt had secured from the King of Prussia, a grant of 15,000 francs for a scientific mission to America. At the suggestion of Lyell, a mutual friend, Mr. John Amory Lowell had invited Agassiz to lecture at Lowell Institute. This institute was intended by its founder to fertilize the general mind rather than to instruct the select few. It is not surprising though, that lecturers for the most part, because of the location of the Institute in the cultural center of Boston,² found themselves addressing trained audiences.

From Boston, Guyot went to Princeton, New Jersey, as

1. Translation was by Professor Cornelius Conway Felton.

2. Smith, Harriette Knight: The History of Lowell Institute, pp. 39-41.

professor of physical geography. During the next few years he wrote a set of grade school geography textbooks, in which he attempted to maintain the scientific viewpoint in emphasizing relationships between man and his natural environment. However, there was dominant in these books the philosophy that the earth was made for man's benefit and enjoyment. For example, the concluding paragraph in one of his texts which was written following the journey method, reads as follows:

"We have now gone over many parts of the earth together. We have found many different kinds of country and in every one we have people and animals, even where it is so cold or so warm or so wet or so dry that we would not suppose they could possibly live; but they are just fitted for their own country and find everything there which they need and can live there better than any place else. How very wise and great and good must be Our Father in Heaven who long ago when he made this beautiful earth knew just what would be needed in every part of it and gave every kind of animal and plant just the home where it could live best and where it would be most useful, for the people for whom he made this world. As we go on studying we shall find more and more things which will show us how this great wise God has thought about every part of the earth to make it in the best way and we might study all our lives without learning all that is pleasant and interesting in this beautiful earth which is our home."¹

By 1875 Guyot's philosophy had found its way through his textbooks into the elementary schools and had colored

1. Guyot, Arnold Henry: Introduction to the Study of Geography, 1866, p. 106.

geographic thought by teleology, that is, the philosophy of the dominance of God in nature. His last work was a volume designed to show that the Book of Revelations and the Book of Nature are in complete harmony with each other.

Louis Agassiz (1807-1873), the Swiss naturalist, although not a geographer, exerted a profound influence on geographic thought in America. His major interest was natural history, including both zoology and geology, and his specialty was fossil fishes. It was through his scientific attitude, his fearless passion for truth, and his unbiased method of research, rather than in any particular subject matter that Agassiz made his contribution to the field of geography. Agassiz's studies of Alpine glaciers inspired geologists to make geological investigations in America, and thus helped to focus the attention of earth scientists on a study of land forms.

Nathaniel Southgate Shaler¹ (1841-1906) went to Cambridge in 1859, to enter Harvard. However, because his tutor wanted him to scan Greek poetry by rule, he changed his plans and entered Lawrence Scientific School. There he

1. Professor Shaler and the Lawrence Scientific School.
Harvard Engineering Journal, Vol. 5, pp. 129-138.

Note: Titles of articles cited without name of author are all by William Morris Davis.

met and worked with Agassiz in zoology and geology. In his courses he was expected to attend lectures, to have access to the laboratory, and to receive instruction in the identification of different rock formations and in methods of conducting a regular geological survey. But his academic work was interrupted by the Civil War. He enlisted immediately after his graduation in 1862 for the remainder² of the War. In 1866 he returned to Harvard to carry on research studies.

Shaler was a geologist by training, but he was able also to find and demonstrate the inter-relationships of earth and man. This he did, not by searching for minute details as ends in themselves, but by attempting broad generalizations which utilized many facts.¹ He was inter-

-
1. Agassiz's teachings were probably the chief source of Shaler's ideas of "broad generalizations". In Shaler's notebook appears under date of April 7, 1860, this entry:

"Prof. Agassiz in his lecture this morning dwelt upon the requirements of a scientific man who would be more than a species describer. The great test, he said, was to be able to deal with your subject in different ways. In amplifying the idea he said it was well to be able to give in a single sentence the whole matter of months of labor, in a form so true that a scientific man could read in it not only the extent of your knowledge but also the habit of your mind. He declared he could learn all this from an answer couched in the most laconic form. He said he should require of us in our several departments first a monograph, second a scientific lecture, third a popular lecture, fourth a simple child's tale."--Autobiography of Nathaniel Southgate Shaler, p. 103.

ested chiefly in the history of continents, seashores, glaciers, glaciation, and in paleontology. The "multiple hypotheses" method of research which he used in teaching gave to those with whom he was associated a system of finding the best possible answer to a problem. For example, in the field, Shaler would state his problem, which might be to explain the origin of a certain land form. He would then present as many hypotheses as he could which might possibly account for the phenomenon. Having formulated these hypotheses he would start in to eliminate those of doubtful validity by finding every objection possible, until he would finally have eliminated all which were invalid.

In the preceding pages, it has been shown how academic geography in America before about 1870 was characterized by "imported" traits. Guyot brought the philosophies of Humboldt and Ritter, which were integrated into a philosophy of his own dominated by teleology. Agassiz, more of a natural scientist, brought a deep interest in geology and a scientific method of study, which soon permeated the eastern centers of learning.

On the other hand, the raw material upon which American geography was eventually to be built, was of a nature which tended to divert interest from that which was dominated by the "presence-of-God-in-nature" philosophy and

direct it toward a more rational view of the subject. The reasons for this shift of attention are not far to seek.

7a About 1830 marks the beginning of an era of public surveys in America.¹ These were, for the most part, geological and were carried out under the direction of individual states. Before 1840, sixteen states had organized surveys and sent out parties of geologists, but between 1840 and 1850, only three new states added surveys.

However, three events, important for their scientific significance, occurred in the decade of 1840-1850.² One was the publication of Louis Agassiz's "Etudes sur les glaciers"; another was the founding in 1847 of the Smithsonian Institution for the collection and dissemination of knowledge; and a third was the formation in 1848 of the American Association for the Advancement of Science.

Agassiz's "Etudes sur les glaciers"³ had a profound effect on the science of geology, an effect more pronounced immediately in Germany, France, and England than in America where it was only half-heartedly received. But with the coming of Agassiz to America in 1846, the problem of the

1. Merrill, George P.: The First One Hundred Years of American Geology, p. 127.

2. Ibid., pp. 209-211.

3. Ibid., p. 615.