

**BIOGRAPHICAL MEMOIR
OF JAMES DWIGHT DANA,
1813-1895. PP. 41-92**

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LOUIS V. PIRSSON

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BIOGRAPHICAL MEMOIR

OF

JAMES DWIGHT DANA

1813-1895

BY

LOUIS V. PIRSSON

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INTRODUCTION

If it appears strange that over twenty years should have elapsed since the death of the noted geologist, James Dwight Dana, before a biographical memoir of his life and work should be presented to the members of this Academy, this has been due to a variety of circumstances, which need not be dwelt upon here. If we have on the one hand the feeling that this should have been done before, on the other there is the advantage that from the time that has passed we are enabled to enlarge our perspective and to see in a clearer light the character of the man and the service which he rendered to American science. During this period, also, a life of Dana and various biographical notices, together with estimates of him as a teacher and as a scientist, have appeared, and this material has been freely used by the writer, upon whom has fallen the privilege of presenting a memoir to the Academy of one of its founders and most distinguished members.*

* The more important American biographical notices which have come to the attention of the writer are the following:

- James Dwight Dana, by Edward S. Dana, *Amer. Journ. Sci.*, vol. XLIX, pp. 1-28, 1895; with bibliography.
- Memorial Address (James D. Dana and William D. Whitney), by Pres. Timothy Dwight, June 23, 1895.
- James D. Dana as a Teacher of Geology, by O. C. Farrington, *Journ. Geol.*, vol. III, p. 335, 1895.
- James D. Dana as a Geologist, by H. S. Williams. *Ibid.*, p. 601.
- James Dwight Dana, by C. E. Beecher, *Amer. Geologist*, vol. XVII, 1896, pp. 1-16.
- Memoir of James Dwight Dana, by Joseph Le Conte, *Bull. Geol. Soc. Amer.*, vol. 7, 1896, pp. 461-479.
- James Dwight Dana, by J. W. Powell, *Science*, new ser., vol. III, 1896, pp. 181-185.

A slender, erect figure of medium height; a well-shaped head, crowned with a mass of white hair; a thin, sensitive face with finely carved features, clean shaven, with a bronzed complexion; keen blue eyes and a kindly smile, touched with a trace of humor—such was the appearance of Professor Dana in the fall of 1881, as it impressed itself upon the memory of the writer, who, with other students, met him on a Saturday afternoon for a geological excursion in the environs of New Haven. He was then 68 years old, and still in the very crown of his active life. His alertness, vivacity, quickness of movement, and the general impression of physical energy and vigor which characterized him gave no hint of the many years during which he had struggled against disability. The effect he produced was immediate, and one could not meet him without recognizing at once that he was an extraordinary man, of superior intellect, capacity, and knowledge. The memory of Dana and that excursion as he conducted it is one of the most clearly cut impressions of the student days of the writer.

The last recollection is equally clear. Shortly before his death he brought to the writer's laboratory in Peabody Museum a fragment of rock from a ledge barely exposed in the lagoon of Clipperton Atoll which had been sent him by a naval officer. He believed it to be of volcanic nature, but desired an examination of it according to the latest petrographic methods. It proved to be a fragment of altered trachyte, and thus confirmed him in the view that it represented the final remnant left exposed of a subsiding volcanic island. It was, therefore, to him, almost at the very end of his life, another proof of the correctness of the theory that the Pacific atolls have been formed by the subsidence of oceanic islands—a matter which will be considered more in detail later. He was as full of keen

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- Life of James Dwight Dana, by Daniel C. Gilman, 8°, pp. 409, 1890.
 Dana the Man, by Wm. North Rice; Dana the Teacher, by E. O. Hovey; Dana the Geologist, by G. P. Merrill; Dana the Zoölogist, by John M. Clarke; addresses at the Dana Centenary of the Geological Society of America, Bull., vol. 24, 1913, pp. 55-69.
 The Geology of James Dwight Dana, by Wm. North Rice, in Problems of American Geology, pp. 1-42, a series of lectures delivered at Yale University on the Silliman Foundation, December, 1913, commemorative of J. D. Dana, 8°, pp. 505, New Haven, 1915.

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interest over this discovery as he might have been forty years earlier; one could see no abatement of this interest in his work to the very end of his life.

The writer offers these first and last recollections of Professor Dana because they may recall to those yet living who knew him, and who may chance to read this memoir, a similar vivid impression of his striking personality; to those who never knew him it would be difficult to convey in mere words the effect which he made upon the men of his generation. The writer cannot speak of this from any intimate personal knowledge of Professor Dana; when after student days his work in the university began, the latter lived a very retired life, and though busily engaged in work, was not often seen by the younger men, though always helpful and glad to see those who had occasion to consult him upon any problem, and he must, therefore, rely upon the testimony of others. For the purposes of this memoir the life of Dana must be considered from two standpoints: first, the account of his life; and, second, the consideration of his scientific work; one cannot, of course, treat of one without to some extent involving the other. It is natural to begin with his history.

EARLY LIFE

James Dwight Dana was born in Utica, N. Y., on the 12th of February, 1813. He was the eldest of a family of ten children. His father, James Dana, was a native of Massachusetts, a direct descendant of Richard Dana, the original immigrant and progenitor of the Dana family in New England. While the immediate derivation seems pretty clearly to be English, the ultimate origin of this stock is held by many to be Italian, partly on account of the nature of the name and partly because a family of Danas has long been existent in Italy, distinguished in intellectual fields and especially in scientific professions.

James Dana married Harriet Dwight, a daughter of Seth Dwight, of Williamsburg, Mass., and moved to Utica, N. Y., where he died, in 1860, at the age of 80. He was a successful man of business, engaged in mercantile pursuits.

Utica, at the time when the subject of this memoir was born, was a small, active town, which was passing beyond the fron-

tier stage and growing in size and importance. The history of the growth and development of the smaller American inland settlements from villages to towns and from towns to cities has been so often repeated that it is familiar to all and we may thus easily picture the conditions under which Dana grew to manhood. It is perhaps worth while to note how many famous Americans have developed under similar circumstances, and this is, perhaps, not difficult to understand when we reflect that these places have been built up successively by the most hardy, energetic, and industrious of our population. At such periods of development there has been nothing of the influence of inherited wealth on the one hand or of extreme poverty on the other. Achievement in some form or other is the result expected by the community in proportion as the opportunities are many. Having passed the frontier stage, the advantages of education in its simple forms are usually good and becoming better, and there is general insistence that they should be employed. When to this we add that Dana was reared in a home characterized by religious feeling, thrift, and common sense, in which, as he himself has said of his parents, "honesty, virtue, and industry seem almost to be our natural inheritance," it can be seen that the environment in his early years was a most favorable one, and we can understand why he himself was distinguished by those traits which he mentions.

It is reported of Dana that as a boy he was fond of collecting and bringing home natural objects. It may be that this shows the dawning of his instinct toward science; but we must not make too much of this, for it is a trait common to most boys and may well be due to the natural impulse toward acquisition. However this may be, we know that he came first under scientific instruction when, at the age of fourteen, he began to attend the Utica High School, then recently founded by Charles Bartlett, a graduate of Union College, who had studied the character of a number of educational institutions and had the breadth of view and foresight at that day to arrange for a teacher of natural sciences.

This position was first occupied for three years by Fay Edgerton, a graduate of the Rensselaer Polytechnic Institute, who held classes in chemistry, mineralogy, botany, and geology.

There is testimony that he was an enthusiastic and inspiring teacher. Moreover, he had, happily, the all too rare custom of taking his students afield in pursuit of their nature studies. He made long collecting trips with them to particular localities for rocks and minerals. This, which would at once give dignity and standing to the pursuit of his natural instinct, could not fail to have a great influence upon a boy of Dana's tastes. It was here that he received his direct impulse toward science and his first training in the field in which he was to achieve success, as he himself recognized in after years.

Edgerton was succeeded in 1829 by Asa Gray, afterwards the famous botanist and professor at Harvard University, as teacher of natural sciences, and thus there began an acquaintance between him and Dana which ripened into an enduring friendship. Although this friendship was destined later to have a strong influence upon Dana's career, there is no evidence that during the year they were associated in the Bartlett Academy, before Dana went to college, he came directly under Gray's instruction.

In 1830 Dana entered the sophomore class in Yale College and took his degree of Bachelor of Arts in 1833. He was led to choose Yale, according to his statement, by the wide reputation as a teacher of science enjoyed at that time by the elder Benjamin Silliman. We must not conclude from this, however, that Dana had at this time any clear idea of embracing science as a profession, as we shall see later. The opportunities at that time for a scientific career were scanty, and most American naturalists were impelled into one rather by natural instincts and force of circumstances than by deliberate choice, and very commonly passed into one by way of training for the medical profession.

Although the curriculum of the American college was much simpler and less exacting than now, the fact that Dana was able to enter the sophomore class at the age of 17 and graduate with a good standing in his class is a testimony to his ability and industry as a student. At that time the classics were the backbone of the college course, and the circumstances that Dana had had a rather weak preparation in ancient languages and entered his class a year late are the probable rea-

sons why he did not attain more marked distinction as a general scholar. He was, however, noted for his excellence in mathematics, for which, as we shall see, he had a predilection, and he devoted much time to science, especially to mineralogy and botany.

In his senior year in college we find Dana beginning to concern himself regarding his future career, and in a state of uncertainty which was not resolved until some years later. His love of natural science impelled him in a direction in which he saw no opening, and his father, a practical business man, with a large family dependent upon him, had no belief in the possibility of a successful and independent career in science. In those days an educated man perceived business, the ministry, law, medicine, and teaching open to him as fields of work. For business, law, and medicine Dana, in his letters home, which have been preserved, professed a strong disinclination; of the ministry there seems never to have been any question; and since from the time of his leaving college he must support himself, and did so, he naturally gravitated toward teaching, at which he had begun to earn his living when circumstances opened to him a great opportunity; whereupon he relinquished it until later, when he again assumed it as his vocation.

During his senior year Dana, backed by his friends, solicited from the Government the post of schoolmaster in the Navy. At that time the naval school at Annapolis (1845) had not been founded and it was the custom to furnish the naval vessels carrying midshipmen with teachers who should give suitable instruction to the future officers. Dana obtained the position of instructor in mathematics, was assigned to the *Delaware*, and, in August, 1833, sailed on a cruise to the Mediterranean. The voyage lasted nearly 16 months, and towards the close of 1834 he returned in the frigate *United States*, to which ship he had been transferred at Port Mahon. He visited Minorca and cities on the coast of France and Italy, made an ascent of Vesuvius, passed around Italy through the Straits of Messina, touched at some of the Greek islands, saw Athens, and spent some time at Smyrna.

It can be well imagined that a trip of this nature was not only a source of pleasure, but of great educational value to