

## HOW AGASSIZ TAUGHT ME TO SEE

The following selection is taken from *The Autobiography of Nathaniel Southgate Shaler*, reprinted in Houston Peterson, ed., *Great Teachers* (Vintage Books, 1946) pp. 213-215. Louis Agassiz (1807-1873) was one of the founders of modern American science; Shaler was dean of the scientific school at Harvard from 1891-1906. This incident took place about 1859 and is one of the more famous in the annals of college teaching.

When I sat me down before my tin pan, Agassiz brought me a small fish, placing it before me with the rather stern requirement that I should study it, but should on no account talk to anyone concerning it, nor read anything relating to fish until I had his permission to do so. To my inquiry, "What shall I do?" he said in effect: "Find out what you can without damaging the specimen: when I think that you have done the work, I will question you." In the course of an hour I thought I had compassed that fish; it was rather an unsavory object, giving forth the stench of old alcohol, then loathsome to me, though in time I came to like it. Many of the scales were loosened so that they fell off. It appeared to me to be a case for a summary report, which I was anxious to make and get on to the next stage of the business. But Agassiz, though always within call, concerned himself no further with me that day, nor the next, nor for a week.

At first, this neglect was distressing; but I saw that it was a game, for he was, as I discerned rather than saw, covertly watching me. So I set my wits to work upon the thing, and in the course of a hundred hours or so thought I had done much -- a hundred times as much as seemed possible at the start. I got interested in finding out how the scales went in series, their shape, the form and placement of the teeth, etc. Finally, I felt full of the subject, and probably expressed it in my bearing; as for words about it, then, there were none from my master except his cheery "Good morning." At length, on the seventh day, came the question, "Well?" and my disgorge of learning to him as he sat on the edge of my table, puffing his cigar. At the end of the hour's telling, he swung off and away, saying, "That is not right." Here I began to think that, after all, perhaps the rules for scanning Latin verse were not the worst infliction in the world. Moreover, it was clear that he was playing a game with me to find if I were capable of doing hard, continuous work, without the support of a teacher and this stimulated me to labor.

I went at the task anew, discarded my first notes, and in another week of ten hours a day labor I had results which astonished myself, and satisfied him. Still there was no trace of praise in word or manner. He signified that it would do by placing before me about a half a peck of bones, telling me to see what I could make of them, with no directions to guide me. I soon found that they were the skeletons of half a dozen fishes of different species -- the jaws told me so much at a first inspection. The task evidently was to fit the separate bones together in their proper order. Two months or more went to this task, with no other help than an occasional looking over my grouping with the stereotyped remark: "That is not right." Finally, the task was done, and I was again set upon alcoholic specimens -- this time a remarkable lot of specimens, representing perhaps twenty species of the side-swimmers of Pleuronectidae.

I shall never forget the sense of power in dealing with things which I felt in beginning the more extended work on a group of animals. I had learned the art of comparing objects, which is the basis of the naturalist's work. At this stage I was allowed to read and to discuss my work with

others about me. I did both eagerly, especially interested in the system of classification, then most imperfect. I tried to follow Agassiz's scheme of division into the order of ctenoids and ganoids, with the results that I found one of my species of side-swimmers had cycloid scales on one side and ctenoid on the other. This not only shocked my sense of the value of classification in a way that permitted of no full recovery of my original respect for the process, but for a time shook my confidence in my master's knowledge. At the same time I had a malicious pleasure in exhibiting my find to him, expecting to repay in part the humiliation which he had evidently tried to inflict on my conceit. To my question as to how the nondescript should be classified, he said: "My boy, there are now two of us who know that."

This incident of the fish made an end of my novitiate. After that, with a suddenness of transition which puzzled me, Agassiz became very communicative; we passed, indeed, into the relation of friends of like age and purpose, and he actually consulted me as to what I should like to take up as a field of study...

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### Prominent ichthyologists

**Aristotle** – 384 BC - first to start formally identifying and cataloging fish

**Pierre Belon** (with H. Salviani and G. Rondelet) – wrote the first ichthyology book in the 1500's

**Peter Artedi** – 1705-1734 – “Father of ichthyology,” pushed for standard measures, identified and classified fish, drowned at 29, his work was taken over by Carl Linneaus

**George Cuvier** (with A. Valenciennes) – 1786-1832 - worked on comparative anatomy of fish, described ~5,000 fish in his major publication

**Samuel L. Mitchill** – 1764-1831 – First famous US ichthyologist. Wrote *The Fishes of New-York, described and arranged* (1815).

**Louis Agassiz** – 1807-1873 – wrote some of the first compilations describing the fish fauna of Brazil and central Europe, first notable person to look closely at fossil fishes, by looking at fossil fishes, he came up with a new classification system using scale morphology (because there was no soft tissue in fossils), an ancient lake covering today's Great Lakes is named Lake Agassiz after him.

**Carl Hubbs** – 1894-1979 - one of the biggest names in ichthyology in the 20<sup>th</sup> century. Curator of the fish division of the University of Michigan (1920). Created the Inland Fisheries Research lab at U of M. Worked in Michigan from 1920-1944 where he was instrumental for fisheries science in Michigan and beyond.