Reading the Shape of Nature. Comparative Zoology at the Agassiz Museum

By Mary P. Winsor
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Reviewed by William A.S. Sarjeant
Department of Geological Sciences
University of Saskatchewan
Saskatoon, Saskatchewan S7N 0W0

There can be no question that Louis Agassiz was one of the most colourful and influential figures in 19th-century science. He is remembered, in particular, for his pioneer work on the description of Paleozoic fishes and for the spreading of the gospel of the Quaternary glaciation, and for studies undertaken while in Switzerland and during travels to, or correspondence with, the savants of, other European countries. Upon his immigration to the United States, although his researches continued almost unabated, they were never again to be quite so ground breaking. However, his other achievements were considerable. In particular, he reinvigorated the teaching of zoology and created Harvard's Museum of Comparative Zoology. This museum had two purposes: primarily it was "to provide material for scientific research of the most professional kind" (p. 11), but also it was to serve as an adjunct to the teaching courses.

Agassiz's initial impact upon scientific education in the United States was immense. This was in part because of the originality of his teaching and in part because of his great personal charm; but it was also because of the particular solicitude with which he treated his students, at a time when such an attitude was rare:

Agassiz cultivated each student's devotion with loving concern. By his interest in the details of their living arrangements, including advice on how to use their spare time and money, he placed himself in the role of parent to these young people, some of whom were indeed still in their teens, none past their early twenties. The feelings of one student were typical of the prevailing euphoria:

Prof. Agassiz is 52 years old and a better man never existed. Good natured and clever... There is no better man in the world than Prof. Agassiz. We all feel toward him like a son to a father... [He is an] advisor and friend, one who is pure, good, good in every attribute... (p. 31)

Such glowing testimonials speak indeed of an exceptional man, and, when one considers the distinguished roster of his students, one cannot doubt as to the immense indirect contribution Agassiz made to the development of science in the Americas. Several attained high administrative positions in other museums: Frederic Ward Putnam would become Director of the Peabody Museum of Archeology and Ethnology; Joel Araph Allen, Curator of the American Museum of Natural History; and George Brown Goode, Director of the United States National Museum. David Starr Jordan was to be one of America's most distinguished botanists and President of Stanford University. The roster also included such distinguished geologists as Joseph Le Conte, Nathaniel Southgate Shaler, and Charles F. Hartt (the latter a pioneer in Brazilian geology), and such influential paleontologists as Alpheus Hyatt, Alpheus S. Packard Jr., and Samuel Hubbard Scudder. Indeed, as Ms. Winsor remarks, Agassiz was "trying to invent the graduate student, a generation before the German Ph.D. was finally imported into the United States" (p. 64), by training his students in analytical methods and involving them early in research. It was an approach that stimulated their thinking and made them capable of original work themselves.

Yet, as the years went by, Agassiz began to lose the affection of his students and to forfeit his control of them (p. 60). This had several causes. One was that, with so many other persons with wide-ranging and original minds, the energy he poured initially into new projects faded away as novelty turned into repetitious drudgery (p. 76). Another was the fact that he seemed too often to be claiming those students' work as his own (p. 50, 52). For Agassiz, since he had provided facilities, materials and funds for their work, it was his own; but his students did not share that view, especially since they felt his acknowledgements of their labours to be over grudging. A third reason was that Agassiz was a sedulous and vocal opponent of the concepts of Darwinian evolution, believing instead that "patterns of similarity were sure evidence of a Planning Mind" (p. 2). For students who were embracing those novel and stimulating concepts with great eagerness, their Professor's intellectual conservatism was both outmoded and dismaying.

However, the greatest problem was surely that Agassiz's "hungry ambition to accomplish vast projects" (p. 1) caused him to take on far too many tasks. His projects were costly and the problem of financing them was increasingly an anxiety for him. Yes, his "contagious enthusiasm [and] magnetic personality" (p. 4) might gain him the initial funding to build laboratories and launch projects, but the monies to sustain these operations were less easily come by. As early as 1862 his son Alexander perceptively commented that his father was:

...killing himself by inches with the Museum, his book [the unfinished Contributions to the Natural History of the United States of America], the l
ures he has to give to get the money
to keep the machine going... [THis
has become too serious a question,
his health cannot stand the amount of
work. The Labours at the Museum
ought to be divided so that Father
should not have anything to do with
the Direction of the Museum... [buF All
I say only serves to irritate Father and
to make me tume and boil with rage.
(p. 131)
And, indeed, Louis Agassiz wore him-
self out. After a stroke in 1870, he re-
covered enough to embark again on
intensive campaigns of lecturing and
fund-raising. It was too much; he died in
December 1873 at the relatively early
age of 66.
Already his son Alexander had be-
come rich, through able mine managenent
and percepient investments (p.
137-139). Upon his father's death, he
pledged himself thus:
I shall try and carry out, to the best of
my abilities, the many plans regarding
Penkase [the island summer shool]
and the Museum which were started
by my father, and I shall at least have
the melancholy satisfaction of know-
ing that... his views, whether right or
wrong, and his dearest wishes, will be
faithfully executed, and that I may
raise a monument to him expressing
what he hoped to be able to show,
better perhaps than he himself would
have done, because I shall not be
costantly drawn aside by new plans
and shall not have the incessant
temptation of remodelling as I go
along. (p. 147)
It was a pledge he had cause deeply
to regret. Alexander was a very different
personality from his father, with a "cold
demeanour and ferocious temper" (p.204),
generous in many ways but "not a
forgiving man" (p. 210). He was "nei-
ther skillful nor happy as a teacher" (p.
134) and, although a competent re-
searcher into the zoology of the marine
organisms that interested him, without
the gifts of true originality or mental
flexibility. Unlike his father, he had come
to accept Darwinian evolution (p. 148,
154); but in other regards his mind was
closed, as the bitter controversy with
Theodore Mortensen of Denmark over
echinod classification was to demon-
strate (p. 237-240). His subordinates
might be treated generously, but they
had need always to tread carefully with
Alexander. When Thomas Barbour
came to the Museum in 1902, he "soon
made a point of developing a cordial
relationship with Alexander" (p. 247), a
factor in his being able to build a career
there, but he noted that Alexander was
"considered a terrifying and almost leg-
denary figure by all the graduate stu-
dents" then at Harvard (p. 247). Alex-
ander's power in the museum remained
undiminished until his death in 1910 (p.
221). It was retained, although never so
ruthlessly wielded, by his son George
and his son's widow Mabel, until well into
the second half of this century. Verily
Harvard's museum has been "the
Agassiz Museum."
Mary Winsor's account of the Mu-
seum's evolution is meticulous and ex-
cellenty researched; yet I am not alto-
gether happy with her interpretations.
In particular, I feel her account of Louis
Agassiz is unduly unsympathetic, not
through any desire for iconoclasm, but
because she has not understood the
European intellectual inheritance he
brought with him to Harvard. In Louis's
time in Europe, students were expected
to sit at the feet of their academic mas-
ters and to be grateful for the small or
large coinage of wisdom intermittently
thrown to them. Louis was, for the gener-
ation, exceptionally kind and generous
to his students; indeed (as Ms. Winsor
shows), interested enough in them to
treat them as an ideal father of that time
treated his children. If they undertook
researches under his aegis, were not the
results his intellectual property?
Was it not through his generosity that
they were permitted to work on his ma-
terial and learn therefrom? Why, then,
should they cavil if their results were
published under his name? Was it not
unduly egotistical of them to wish to
claim credit for that work? As for this
prenicious doctrine of Darwinism, was it
not his duty to set their ideas right? They
should be listening to him with respect.
They should not, until much older and
more mature, have the temerity to be
airing their own views!
Yes, it is easy to misunderstand such
proprietal attitudes as Louis's. Indeed,
North Americans, this concept of
the professor as leader and the stu-
dent as mere humble follower has be-
come quite alien. Yet those attitudes
were prevalent in the United States
when he arrived at Harvard and, in Eu-
rope, they have persisted almost up to
the present time. In Germany, for exam-
ple, academic posts were for long not
advertised; they could be gained only
upon the professor's verbal or written
recommendation to his colleagues at
other institutions. That recommenda-
tion would never be given if the student
had not been properly respectful, sub-
servient and an industrious follower of
rules set for him. Moreover, the
results of the research belonged to the
professor, not to the student. I can even
recall a specific instance from the late
1960s where a junior colleague at a
German university had undertaken all
the research, written a paper, and pre-
pared the plates while his professor was
far away in another country, yet was not
given co-authorship and gained only a
one-line acknowledgement in a sub-
stantial text!
These viewpoints on the academic
hierarchy and the "ownership" of re-
search results were at their strongest in
Europe when Louis Agassiz came to
North America. He was more flexible in
outlook than most European scientists
and accommodated to his changed cir-
cumstances remarkably well, initially at
least, as his early successes so clearly
indicate. It is not to be wondered at that,
when ageing and so much overworked,
Louis Agassiz failed to adjust to a
changing and even more liberal intellec-
tual environment. That failure merits
more understanding and sympathy than
it has here received.
Is it true that, as Ms. Winsor states,
"even the most carefully documented
museum must be stuck somewhere
near the bottom of the ladder of scientif-
cal prestige" (p.270)? I trust that is not so
in the academic world, for the collec-
tions of such museums are as funda-
mental to research in natural history
and palaeontology as are books to lit-
erary scholars. Yet I fear it is true in terms
of public perception. Have we not seen
the researchers at the once-properly-
revered British Museum (Natural Histo-
ry) so savagely decimated that many
formerly vigorous lineages of scientific
enquiry are now extinct in Britain, with
the retitled Natural History Museum
viewed merely as a place for public en-
tertainment and money-making? Per-
haps Louis Agassiz's concepts of classi-
fication of organisms are no longer ac-
cetable. However, if we could find a
contemporary individual as capable as
he was of convincing the rich and
powerful of the value of such museums,
what a blessing to science it would be!
Yet I shall not end on a sour note.
Scientific historians and museologists
alike should read this work for the lucid
picture it presents of the development
and the vicissitudes of a great scientific institution. If their conclusions, like mine, differ from the author's, well, we should be grateful for the data so carefully organized and presented to us, for they have surely been stimulating to our thinking.

**Science in the Subarctic. Trappers, Traders and the Smithsonian Institution**

By Debra Lindsay

*Foreword by William W. Fitzhugh
Smithsonian Institution Press
Washington, DC
1993, 176 p., US $34.00

Reviewed by William A.S. Sarjeant
Department of Geological Sciences
University of Saskatchewan
114 Science Place
Saskatoon, Saskatchewan S7N 0W0

To set the scene for this review, it is appropriate to quote from William Fitzhugh's foreword (p. x, xi):

Baird's field collecting method emphasized the collection of large numbers of carefully documented 'voucher' specimens from a given region; such specimens, with later description and analysis, established a firm empirical basis for scientific classification. With analysis of field documentation and careful comparison of specimens, the method supported classification studies that, at higher levels of abstraction, revealed geographic, evolutionary, and historical relationships. The method applied equally to species of animals and plants, to languages, and to ethnographic studies. As the study region was gradually expanded, larger patterns developed that provided solutions to major problems of biological and cultural classification. Baird was particularly aware of the pristine conditions for collecting in northwestern Canada, the Northwest Coast, the Russian America. The prospects of expanding such analyses toward the Northwest, into Alaska, and eventually across Bering Strait into Asia were the larger vision that inspired Baird's labors as a research organizer in northwestern North America. [Robert] Kennicott's later Alaskan work as leader of the Western Union Telegraphy survey became the Smithsonian's entrée into Russian America, influenced the purchase of Alaska, and resulted in the training of the first generation of America's Alaskan scientists, including William Healey Dal, Henry Wood Elliott, and others...

One of the most important innovations of Kennicott's Mackenzie program was the involvement of native collectors. Roderick MacFarlane, a Hudson's Bay Company agent, used native people extensively and to great advantage, making important collections of animals, birds, and ethnographic objects during the winter season when post managers and most naturalists were not out and about. The use of native collectors also provided other advantages, including the acquisition of native names, terminology, and observations on animal behaviour, on biological phase changes, and on ethnographic data.

The theme of this book, then, is potentially a very interesting one and it is clear, from the sources she quotes, that Ms. Lindsay undertook very extensive researches before writing it. There are three troubles with it. First, the title is misleading, suggesting a much fuller survey of the Smithsonian's connections with the subarctic than is actually presented. Second, the text is too brief for any in-depth examination of her themes, a mere 130 pages, forcing too much to be epitomized or cited without sufficiently full quotation. Third, as I shall illustrate below, she is not a good writer. A fourth objection for readers of this journal is that she is a historian, with interest in biology but not in geology. Although Baird indirectly, and Kennicott directly, made appreciable contributions to our knowledge of the geology of subarctic Canada, rocks, fossils and geology gain only the most passing of mentions (on pages 30, 31, 101, 113 and 185).

Problems for the reader are numerous. There are irritating duplications: the oologist Thomas Brewer is introduced on page 25 and again on page 33; the comments on Kennicott on pages 46-48 are repetituous; and Kennicott's view of egg-collecting as "glorious sport" (p. 70) unnecessarily prefaces a long quotation — one of very few — which included that phrase. There are phraseological awkwardnesses: "Fort Anderson did not drain into the Mackenzie River System" (p. 61) and "Their activities were similarly precipitated by scientific visitors" (p. 43). There are unexplained contradictions, as when page 105 informs us that Kennicott "had always intended on going to Russian America" whereas page 106 tells us how very hard it was for Western Union to persuade him to do so!

Kennicott is called "the mysterious 'Bugs' Kennicott' on page 49, but we are told neither why he was considered mysterious nor how he gained that nickname. On the whole, the author shows a surprising hostility to Kennicott (p. 113 and earlier), yet her eventual comments on his childhood and physical frailty (p. 116) were not presaged in her earlier text, and his death, probably by suicide, comes to the reader as a shock of unreality.

Do the virtues of this book compensate for these problems? I do not think so, yet it has its importance in stressing how much the attainments of early field naturalists rested upon the work — sometimes voluntary, more often paid — of their assistants (native Americans in particular). For that reason alone, perhaps it deserves to be read until a better study, with fuller documentation by direct quotation from the original sources, is available.

**From Stone to Star. A View of Modern Geology**

By Claude Allègre
Translated from French by Deborah Kurmes Van Dam
Harvard University Press
US $16.95, paper

Reviewed by William A.S. Sarjeant
Department of Geological Sciences
University of Saskatchewan
114 Science Place
Saskatoon, Saskatchewan S7N 5E2

A first requirement of a scientific text, surely, is that it should be accurately titled. In that regard, this title begins well, but ends ill. It is a history of how the investigations of scientists extended from the consideration of the rocks of this earth to the spectrum of stars and the constitution of the Universe: thus, From Stone to Star is accurate enough. However, it is not a view of modern geology. On the one hand, the account ranges far beyond geology into physics and astronomy, so that the subtitle is not broad enough. On the other hand, only