

Charles Darwin's Zoology Notes and Specimen Lists from HMS 'Beagle'

Edited by Richard Keynes

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The first of many editions of Darwin's well known *Journal of Researches* was published three years after his return on HMS 'Beagle', in 1839. It was based upon the notes he made during his voyage between 1832 and 1836 and is still most interesting reading, giving as it does a picture of Darwin's character from his retrospective reflections on his experiences. On his return to England, Darwin superintended the five volumes of the zoology of the 'Beagle' written by specialists in different fields, based on the notes and on the 5000 specimens he sent back. The first of these came out in the same year as his *Journal*, and the last (somewhat tardily, as Professor Keynes explains), in 1843. With all this already long published, it might be supposed that the zoological notes and specimen lists of the present volume would add little to what is already in print.

But this is very far from the case, and all zoologists and indeed all interested in the development of one of the most influential scientists who ever lived will be much indebted to Professor R.D. Keynes for the care and patience representing many years effort that he has devoted to the hitherto unpublished notes made by his great grandfather.

These notes are exceptionally interesting in several ways. First, as we read, we are in a sense looking over Darwin's shoulder as he makes his notes. The immediacy is fascinating, for we share his interest when he looks with his small Banck's monocular microscope at many planktonic forms which he had caught with a trawl of bunting he devised on board; as he ponders the distribution of dung beetles; or carefully allows a large bedbug to suck blood from his finger. Professor Keynes points out in a perceptive and helpful introduction, that he had a reasonable zoological library aboard, including 17 volumes of the French encyclopaedic dictionary of natural history, so that he could identify many of the forms that he saw, but some, like the arrow worm he drew on 11 January 1832 on the first page of his zoological notes (Plate 1, p. 4 of the present volume) puzzled him much since it was not in any of his books. He described it as a very simple animal, but later, in September when he examined more specimens, found it to be more complicated than he had first supposed, and remarked that "The more I understand of its organization, the more I am at a loss where to rank it amongst other animals". He was still puzzled by its affinities when he came to write a paper about it in 1844, and even almost two centuries later, arrow worms remain perhaps the most isolated group in the animal kingdom.

The editor's arrangement of the notes is similar to that adopted by the editors of Darwin's letters, and is most helpful: useful footnotes are placed at the end of each page of the notebook. It is a great merit for the present day zoologist that Professor Keynes has almost invariably been able to identify the organisms that Darwin examined to their present day names (at least down to genus), even from his usually rather sketchy drawings. Some puzzles remain however, for instance the animal thought by Darwin to be allied to *Lucernaria* and sketched on p. 267 seems very different to any living stauromedusan (which

it is identified as), or the curious apparently parasitic 'echinoderms sans pieds' attached to a medusa, which are thought to be marine leeches on p. 269–271. However, Professor Keynes has successfully undertaken (with the aid of the specialists mentioned in the introduction) this task, and his notes are illuminating rather than simply curt identifications, with comments and cross-references. Darwin himself regretted that his drawings were not better, but at least in some instances, such as the figures of a brooded ascidian tadpole from the Straits of Magellan, or the details of the ctenophores he found in August and September 1832 his drawings show well many closely observed details. At other times, as for example when he records the disposition of the eyes of the gossamer spiders that came aboard as the 'Beagle' crossed the river Plate to Buenos Aires, they are just sketch diagrams.

It is hard not to continue to give examples of Darwin's observations, as a marine zoologist myself, I am naturally biased towards his work on shore animals and those collected during the long periods he spent at sea, but he is equally interesting about driver ants, rodents, or glow worms and fireflies. Several things about the notes naturally strike the reader.

First, Darwin is above all intensely curious. He constantly is trying small experiments, putting a land planarian in water to see if it really came from a nearby brook, or teasing the avicularium of a bryozoan with a small needle between its jaws. Secondly, and perhaps above all, Darwin was from the first an extremely careful and assiduous observer.

He notes the colours of animals with much care, using a colour atlas on board, often evidently much struck by their beauty, as when he notes that the eye of a dogfish had a "pupil pale 'Verdegris green' but with lustre of a jewel, appearing like a sapphire or Beryl".

Rather little speculation enters into these notes as Professor Keynes points out in his introduction and footnotes. Darwin is much interested in the geographical distribution of animals and plants, and in varieties of such animals as rats on different islands, and wonders whether they may be indigenous or transported there. Yet there is no real hint in these notes of the *Origin*, although with hindsight we see observations that must have later served to set his ideas in train. If we had not known the author of these notes, we should have immediately recognized that we were reading the notes of a highly curious, intelligent and exceptionally skilful observer: to paraphrase what Gauss said of another very remarkable English scientist, we recognize the lion's paw. Certainly, this is to some extent a specialist book for zoologists, but because of the way that it is presented by the editor it is made available to all biologists and is in fact a most fascinating read. It is particularly carefully produced, I have only observed two misprints which for a book of this complexity and size is a real tribute to the editor and the press.

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