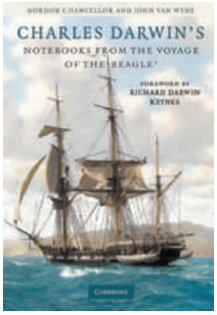
As Darwin wrote



Charles Darwin's Notebooks From the Voyage of the Beagle

edited by Gordon Chancellor and John van Wyhe

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Copies of *On the Origin of Species* are available in almost every bookshop, but access to the notes that Charles Darwin used to formulate his theories on evolution and geological processes has been limited to the excerpts published in Nora Barlow's *Charles Darwin and the Voyage of the Beagle* and microfiche copies. An initial transcription of Darwin's diaries from the 1831–36 voyage of the *Beagle* is available online at www.darwin-online.org.uk. Now, a final revision has led to the publication of these important works in book format.

Fans of Barlow's book, which recounted primarily biological observations, may be surprised that the diaries themselves are overwhelmingly dedicated to the geology of the sites he visited. His earliest diary — the *Cape de Verds* notebook — contains only brief descriptions of rock types and the geological setting, whereas later notebooks contain detailed descriptions of the geology interspersed with information about the history of the region and anecdotal stories from local guides, documenting Darwin's growth as a geologic observer.

I found the most intriguing part of the diaries to be the reproduction of Darwin's sketches. Although these interesting sketches are rudimentary at times, they provide glimpses of his view of the landscape and what mattered most to him. It is a credit to the editors that the drawings are reproduced as they appear in the notebooks, but this makes interpreting them a bit challenging. In a few cases, it was difficult to be convinced that a particular feature depicted in the drawing was a dyke, rather than an eel. Of course, this may very well have been a result of Darwin's rather hasty sketching. Hints or potential interpretations provided by the editors definitely help, especially when the significance of a drawing cannot be easily determined from the text.

The notebooks sometimes contain a bewildering mixture of topics. A single page in the earlier works, in particular, might cover regional epidemics, volcanic structures and the bird calls Darwin heard while walking. In this regard, the editors' introduction to each notebook is indispensable. The editors' notes describe the history of the voyage that is represented by the notebooks, and interesting points from the text are highlighted. They also link specific entries to Darwin's later scientific publications, demonstrating the progression from observation to interpretation.

The book itself is not a light read. But readers who persevere will be rewarded by fascinating insights into Darwin's evolution as a scientist. The notebooks also reveal a more personal side of Darwin, with descriptions of lonely roads, tiring travels and interesting encounters with people he met along the way. These anecdotes introduce readers to the young scientist who did not yet know that he would go on to dramatically alter the way we view life on Earth. ❐

REVIEWED BY ALICIA NEWTON

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Darwin on the rocks

EXHIBITION

Darwin the Geologist may well be tucked away in a corner of the Sedgwick Museum in the University of Cambridge, but this exhibition packs quite the punch. For a traditional geologist such as myself, it is a humbling experience to be able to catch glimpses of Darwin's sheer observational genius in the field and his meticulous documentation. But there is much here for the scientist in general, who will be transported to an era refreshingly devoid of the somewhat dreary, but perhaps unavoidable, modern-day burden of super-specialization. And members of the general public, particularly the young ones who want to combine their curiosity with plain old fun, will not be disappointed either.

The exhibits include rocks and minerals collected by the man himself during his voyage on the *Beagle*, as well as field notes, maps and instruments of the sort that he would have routinely used. Admittedly, the samples look rather unremarkable, but the stories they tell are far from mundane. And what better way to convey these stories than the interactive globe that forms the centrepiece of the exhibition? Surrounding the globe are various rocks from Darwin's collection, and at the press of a button, the viewer can see the sample location on the globe and read interesting tit-bits.

Almost every exhibit provides insights into Darwin's thinking and the places he visited. While reading about his climb up a Tahitian mountain or his descriptions of a volcanic eruption in Chile, one cannot help but be fascinated by his insatiable appetite for understanding and interpreting the world around him. Together, the items on display and the informational posters present a nice picture of Darwin's interest in geology and the varied experiences that conditioned his geologic thought. For those who may not find time to go through Darwin's notebooks — recently published in book form (see review above) — this exhibition can provide an excellent sampler.

We are told, for example, that Darwin neglected his medical studies at Edinburgh University because he hated surgery, but it was here that he was introduced to the famous controversy about whether granite formed from magma or was deposited from water. The work of the famous German explorer Alexander von Humboldt inspired the young Darwin to see the interconnections between various aspects of nature. And under the tutelage of the well-known Cambridge geologist Adam Sedgwick — after whom the museum in the Department of Earth Sciences is named — Darwin honed his mapping skills.

Darwin's evolutionary thought tends to outshine his other, earlier work. It is to

the merit of this exhibition that it reminds us of his profound contributions to geologic thought. For example, some of the exhibits show how he combined disparate observations with creative thinking to come up with a hypothesis regarding the formation of coral reefs such as those found in the Pacific Ocean; this hypothesis was subsequently borne out by drilling in the latter half of the twentieth century. And in seeking to explain how various igneous rocks on one of the Galapagos Islands were related to each other, Darwin shed invaluable light on how magmas evolve.

One of the exhibits tells us how modern researchers at the University of Cambridge and elsewhere are building on Darwin's insights, for example, by revisiting the Galapagos Islands and analysing its volcanic rocks. There are plenty of hands-on activities too, and younger visitors will surely enjoy the jigsaw puzzle of the *Beagle* and a touch screen that leads you on a virtual collection trip.

It is known that Darwin's geological experience greatly influenced his subsequent work on evolution (see the Commentary on page 666 of this issue). But it was only after seeing the exhibition that it dawned on me how this 'way of being' — a certain comportment resulting from geological fieldwork — must have preconditioned Charles Darwin to delve into uncovering the origin of species. ❐

REVIEWED BY NINAD BONDRE

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Darwin the Geologist is a permanent exhibition at the Sedgwick Museum of Earth Sciences in the University of Cambridge. The Sedgwick Museum is in the main building (Downing Street) of the Department of Earth Sciences.