

Lectures 8: Darwin and Wallace: Voyages of Exploration

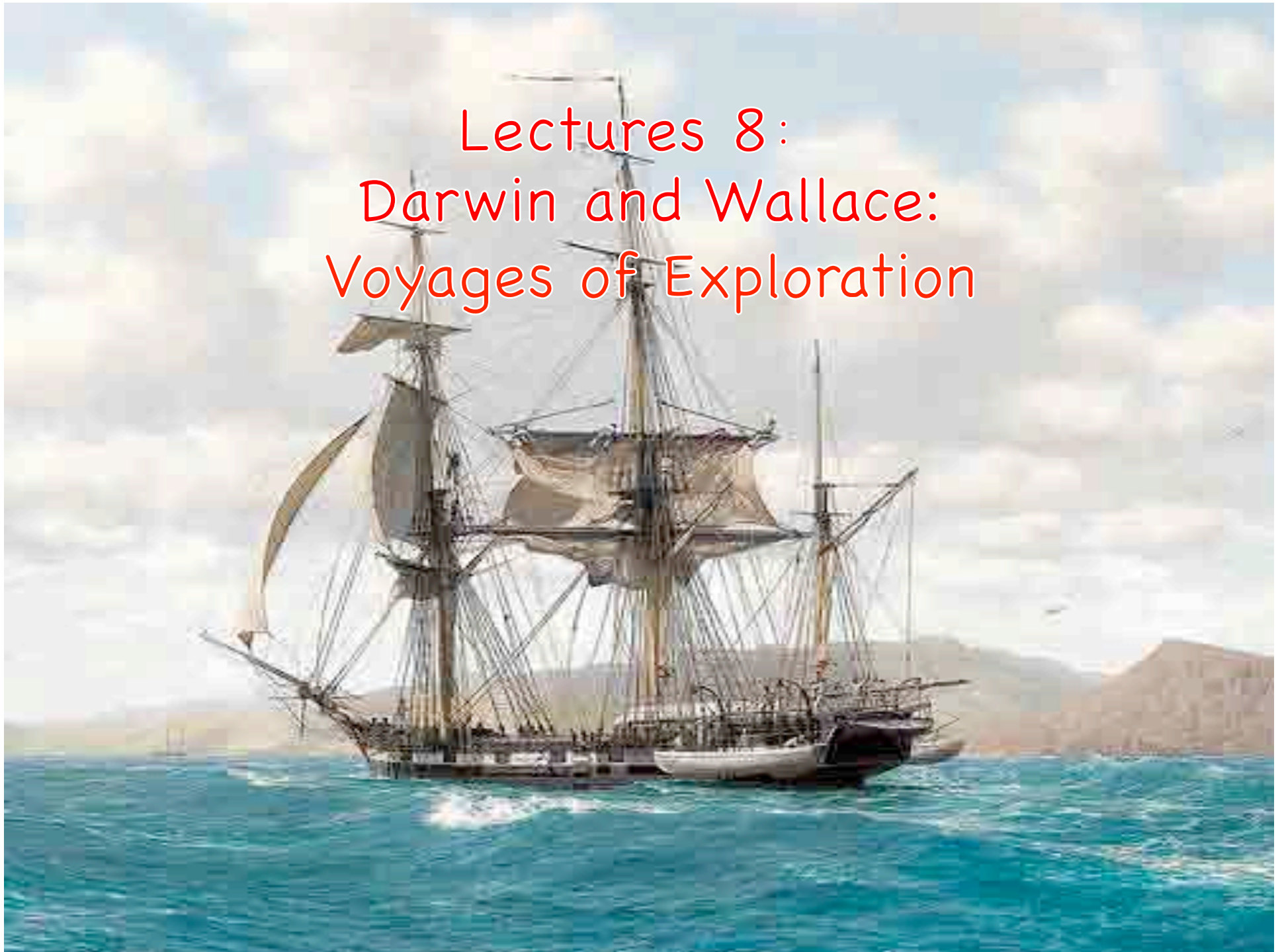


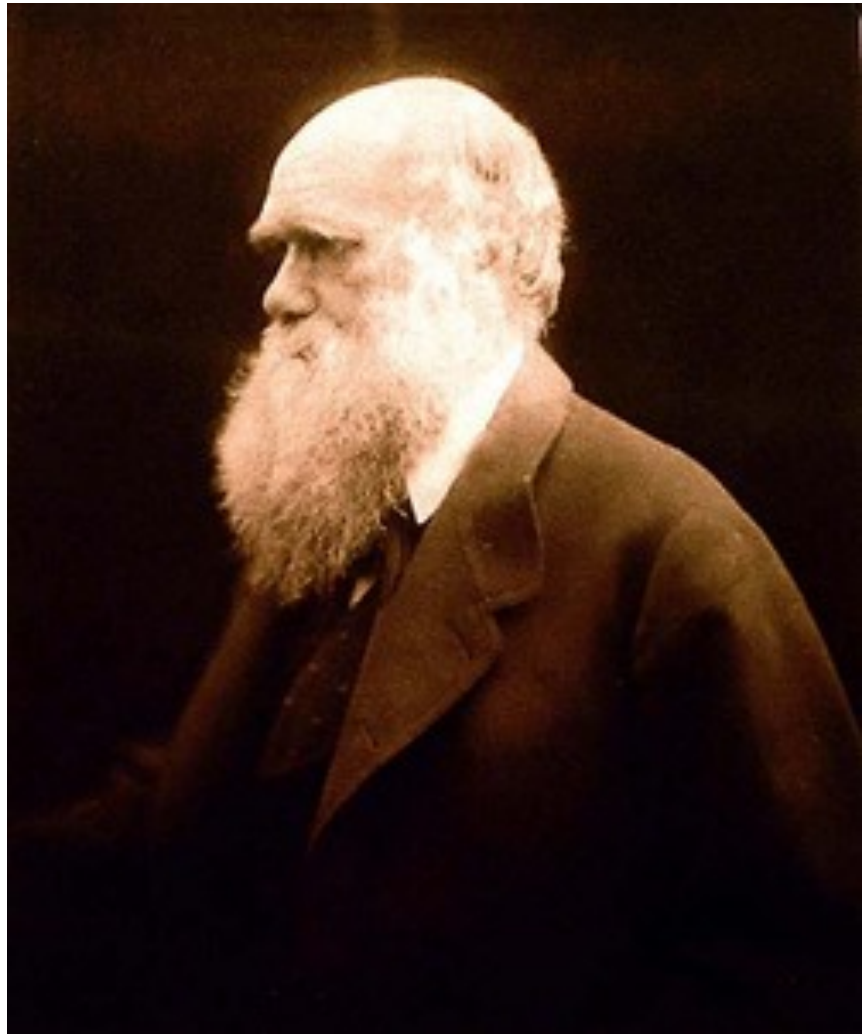
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Two independent but remarkably parallel journeys of discovery



Charles Darwin

*Question:
What do we
know about
this man?*

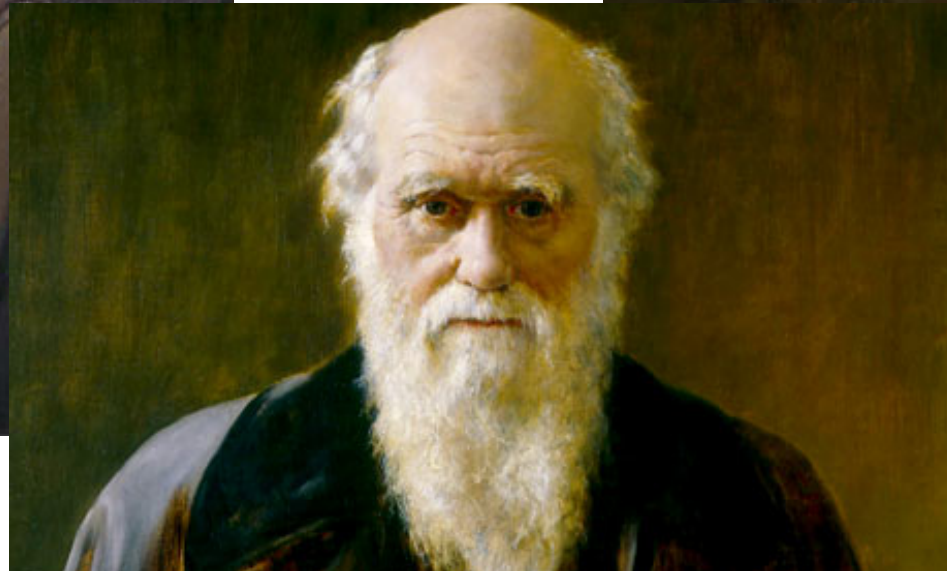


Charles Darwin, 1809–1882

- The “largest character” in our story
- Born into a wealthy family in the English midlands
- Became England’s – and the world’s – most famous “gentleman-naturalist”



The Darwins: A prosperous Midlands medical family



The making of a naturalist: take #1

- *"I...attended on two occasions the operating theatre in the hospital at Edinburgh, and saw two very bad operations, one on a child, but I rushed away before they were completed. Nor did I ever attend again, for hardly any inducement would have been strong enough to make me do so; this being long before the blessed days of chloroform. The two cases fairly haunted me for many a long year."*
- *"You care for nothing but shooting, dogs, and rat-catching, and you will be a disgrace to yourself and all your family."*
- *"During the three years which I spent at Cambridge my time was wasted, as far as the academical studies were concerned, as completely as at Edinburgh and at school."*

The making of a naturalist: take #2

- **Edinburgh:** *"Drs. Grant and Coldstream attended much to marine Zoology, and I often accompanied the former to collect animals in the tidal pools, which I dissected as well as I could."*
- **Cambridge:** *"But no pursuit at Cambridge was followed with nearly so much eagerness or gave me so much pleasure as collecting beetles".*
- **Cambridge:** Again, Darwin made a point of getting to know the leading naturalists in the university, taking every opportunity to benefit from their mentorship.

The making of a naturalist: take #3

- Darwin became a student of John Stevens Henslow, Professor of Botany, accompanying him on field trips and becoming known as “the man who walks with Henslow”
- Darwin also got to know Adam Sedgwick, and received his introduction to field geology on a field trip to North Wales with Sedgwick in the summer of 1831
- Darwin was introduced to English natural theology, through his (obligatory) study of the works of William Paley

John Stephens Henslow

- Professor of Botany, Cambridge
- Darwin's mentor:
 - taught him
 - mentored him
 - helped persuade his father to let him join the *Beagle*
 - kept in touch with him throughout the voyage



Adam Sedgwick, 1785-1873

- Anglican clergyman and self-taught geologist
- Woodwardian Professor of Geology at Cambridge, 1818-187
- A leading exponent of natural theology in England in the early-19th century
- Introduced Darwin to (catastrophist) geology



Paley's & Darwin's Room at Christ's College



Photo courtesy of [Richard Carter](#) on Flickr.

Darwin on Paley

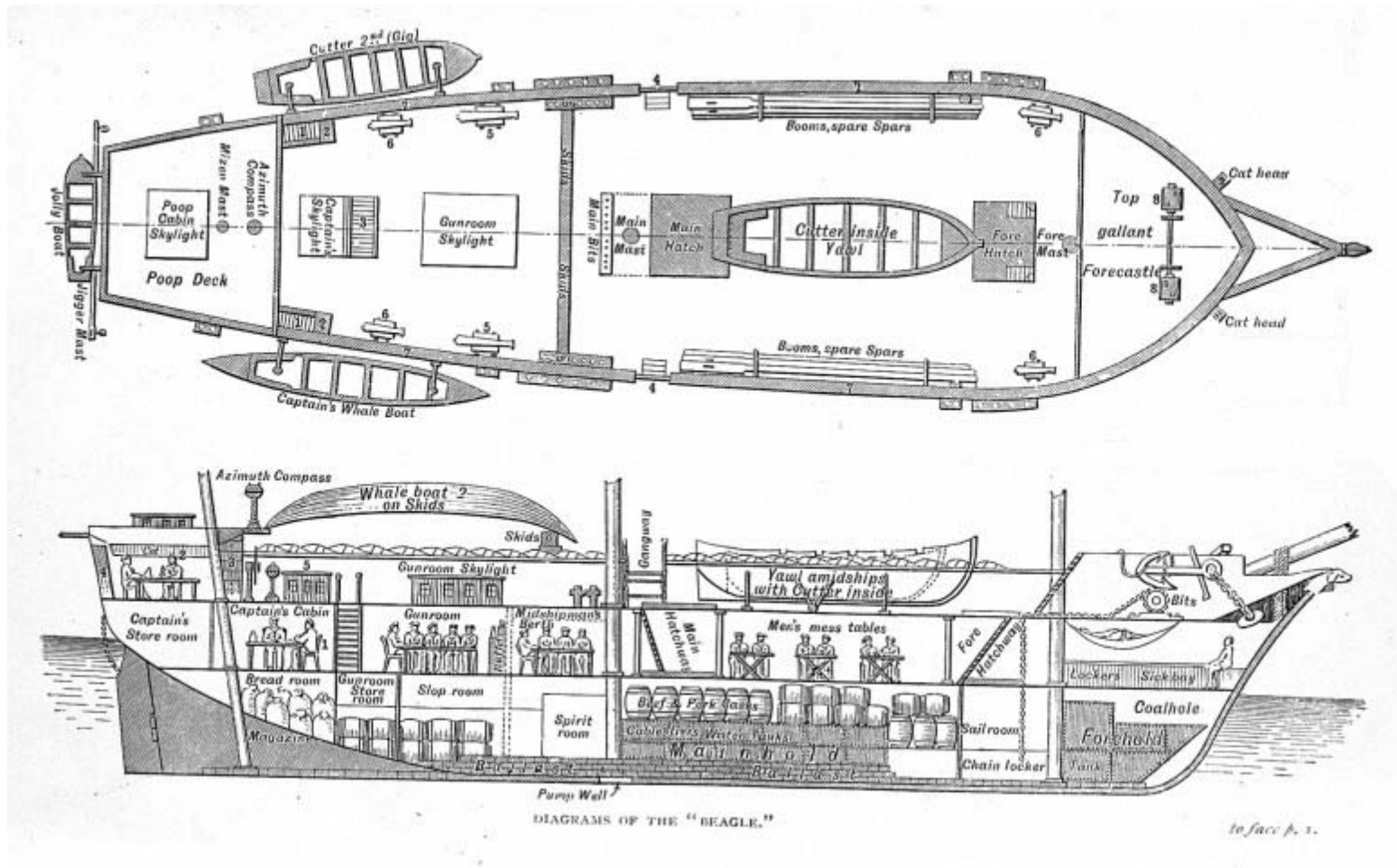
"In order to pass the B.A. examination, it was also necessary to get up Paley's Evidences of Christianity, and his Moral Philosophy. This was done in a thorough manner, and I am convinced that I could have written out the whole of the Evidences with perfect correctness, but not of course in the clear language of Paley. The logic of this book and, as I may add, of his Natural Theology gave me as much delight as did Euclid. The careful study of these works, without attempting to learn any part by rote, was the only part of the academical course which, as I then felt and as I still believe, was of the least use to me in the education of my mind. I did not at that time trouble myself about Paley's premises; and taking these on trust, I was charmed and convinced by the long line of argumentation."

The opportunity of the *Beagle*



Captain Robert Fitzroy

HMS Beagle: Just 90ft 4in long



Map of the route taken by the H.M.S. Beagle, 1831-1836, removed due to copyright restrictions. See: <http://www.lucyonline.nl/darwin/darwin.htm>.

Key moments from the voyage

- “Seeing the world through Lyell’s eyes”
- Discovering fossil edentates in South America
- His experience of the sublime, in encounter with a tropical rain forest in Brazil:
“Twiners entwining twiners, beautiful lepidoptera, silence, hosanna!”
- His first sight of “savages” – the native inhabitants of Tierra del Fuego
- An all-too-short visit to the Galapagos Islands

Seeing the world “through
Lyell’s eyes”: Darwin’s theory
of coral reef formation

Darwin's Toxodon

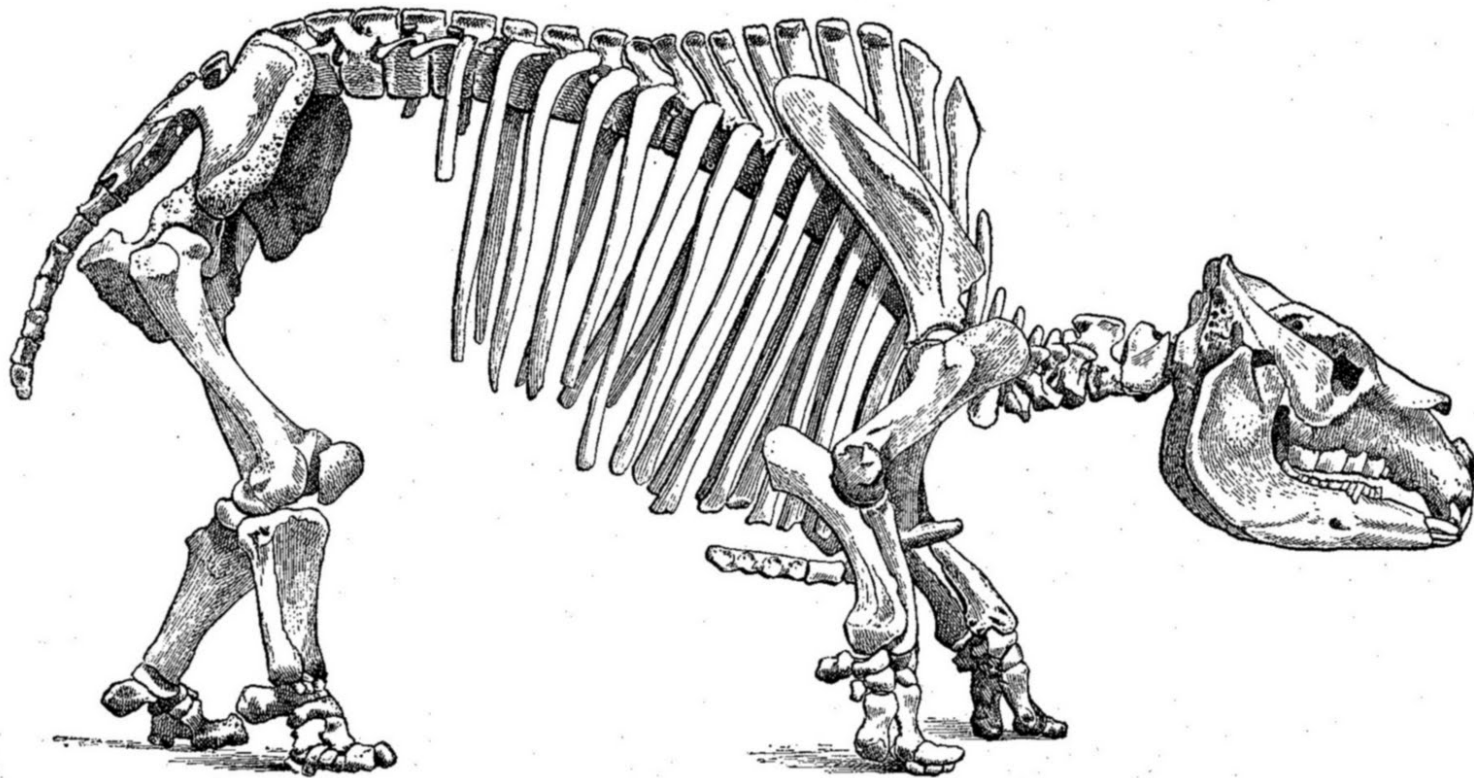


FIG. 4.—The skeleton of a gigantic extinct rat-like animal—the Toxodon—from the Argentine, South America. Length from the snout to the tail, nine feet. (This figure is lent by the Trustees of the British Museum).

Darwin's Megatherium



- Like Cuvier before him, Darwin recognized what kind of beast this was; and he saw its affinities with the living sloths and anteaters of South America

Darwin and the Fuegians

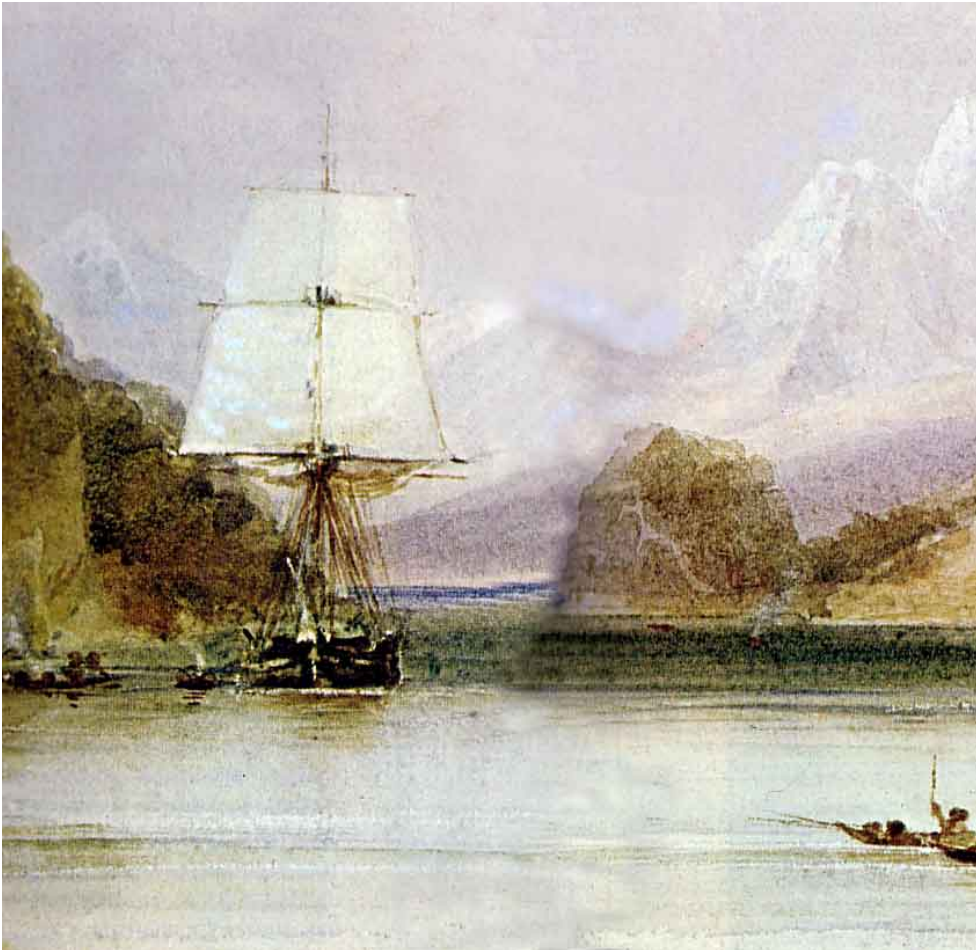




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What was so special for Darwin about the Galapagos Islands?

The islands are volcanic, and of geologically recent origin



Photo of volcanic craters courtesy of [barefoot expeditions](#) on Flickr.



Photo of volcanic activity on Fernandina Island courtesy of [ornitholoco](#) on Flickr.

Almost all the plants and animals are unique to these islands



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“Curiouser and curiouser!”

- *“I have said that the Galapagos Archipelago might be called a satellite attached to America, but it should rather be called a group of satellites physically similar, organically distinct, yet intimately related to each other....”*
- Darwin learned that sailors could tell apart tortoises from different islands, by the shapes of their shells...
- And he discovered that the mocking-birds on several different islands were specifically distinct
- He suspected – but couldn’t prove – that the same was true of the many different finch species he’d collected

"The natural history of these islands is eminently curious, and well deserves attention. Most of the organic productions are aboriginal creations, found nowhere else; there is even a difference between the inhabitants of the different islands; yet all show a marked relationship with those of America, though separated from that continent by an open space of ocean, between 500 and 600 miles in width. The archipelago is a little world within itself, or rather a satellite attached to America, whence it has derived a few stray colonists, and has received the general character of its indigenous productions."

"Considering the small size of the islands, we feel the more astonished at the number of their aboriginal beings, and at their confined range. Seeing every height crowned with its crater, and the boundaries of most of the lava-streams still distinct, we are led to believe that within a period geologically recent the unbroken ocean was here spread out. Hence, both in space and time, we seem to be brought somewhat near to that great fact – that mystery of mysteries – the first appearance of new beings on this earth."

Darwin: the adventure of a lifetime

The Beagle voyage gave Darwin

- World-wide geological & biological experience
- the material with which to establish his scientific reputation
- The germ of an idea about “that mystery of mysteries...”

A growing reputation...

"Towards the close of our voyage I received a letter whilst at Ascension, in which my sisters told me that Sedgwick had called on my father, and said that I should take a place among the leading scientific men. I could not at the time understand how he could have learnt anything of my proceedings, but I heard (I believe afterwards) that Henslow had read some of the letters which I wrote to him before the Philosophical Society of Cambridge, and had printed them for private distribution. My collection of fossil bones, which had been sent to Henslow, also excited considerable attention amongst palaeontologists."

The young scientist “in public”

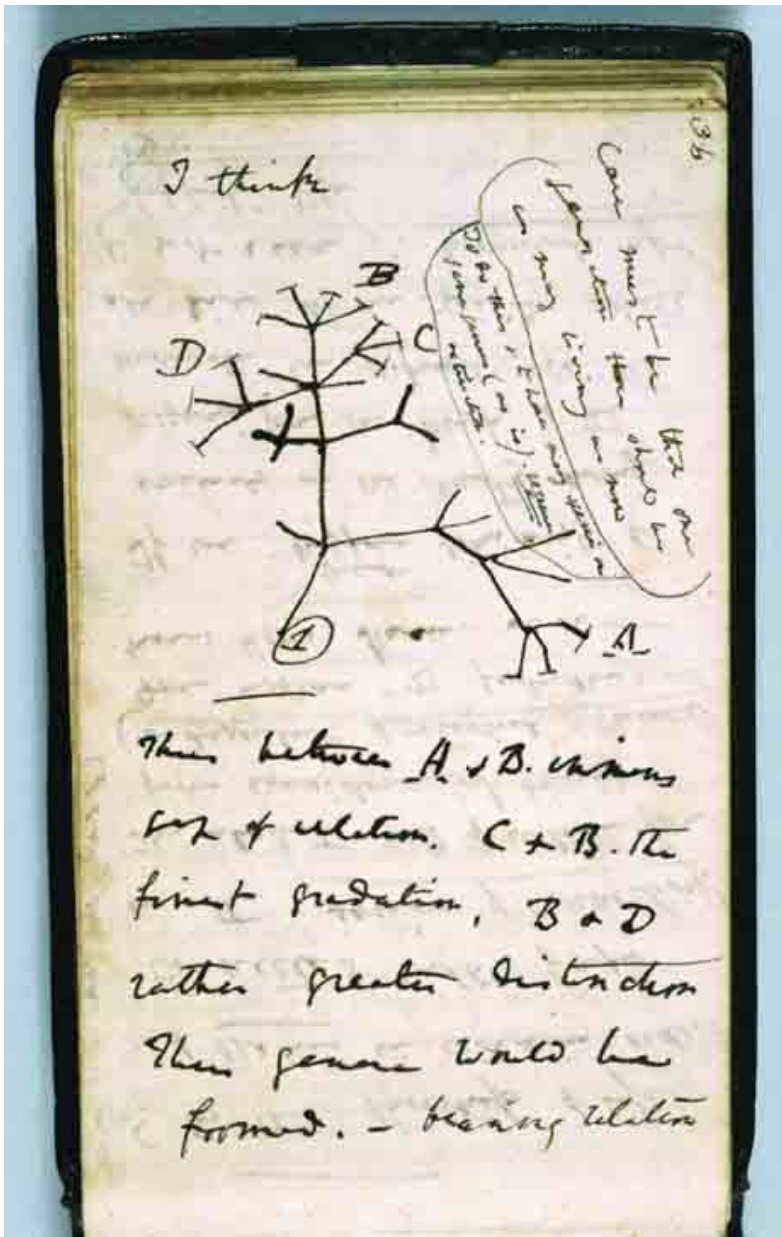
“On March 7th, 1837, I took lodgings in Great Marlborough Street in London, and remained there for nearly two years, until I was married. During these two years I finished my Journal, read several papers before the Geological Society, began preparing the MS. For my Geological Observations, and arranged for the publication of the Zoology of the Voyage of the Beagle....”

Charles Darwin, Autobiography, 1876

The young scientist “in private”

“In July I opened my first note-book for facts in relation to the origin of species, about which I had long reflected, and never ceased working for the next twenty years.”

Charles Darwin, Autobiography, 1876



Coming next:
 Darwin's private
 path to the
 theory of
 evolution by
 natural selection

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