

BIOLOGY

The Beagle Starts Her Voyage

"A Classic of Science"

Darwin's First Letter Home From the Voyage Which Laid The Foundation For the Momentous Theory of Evolution

THE LIFE AND LETTERS OF CHARLES DARWIN, Edited by his son, Francis Darwin. 2 vol. New York, Appleton, 1887.

C. Darwin to R. W. Darwin

Bahia, or San Salvador, Brazils,

[February 8, 1832].

I find after the first page I have been writing to my sisters.

MY DEAR FATHER,

I AM WRITING this on the 8th of February, one day's sail past St. Jago (Cape de Verd), and intend taking the chance of meeting with a homeward-bound vessel somewhere about the equator. The date, however, will tell this whenever the opportunity occurs. I will now begin from the day of leaving England, and give a short account of our progress. We sailed, as you know, on the 27th of December, and have been fortunate enough to have had from that time to the present a fair and moderate breeze. It afterwards proved that we had escaped a heavy gale in the Channel, another at Madeira, and another on [the] Coast of Africa. But in escaping the gale, we felt its consequences—a heavy sea. In the Bay of Biscay there was a long and continuous swell, and the misery I endured from sea-sickness is far beyond what I ever guessed at. I believe you are curious about it. I will give you all my dear-bought experience. Nobody who has only been to sea for twenty-four hours has a right to say that sea-sickness is even uncomfortable. The real misery only begins when you are so exhausted that a little exertion makes a feeling of faintness come on. I found nothing but lying in my hammock did me any good. I must especially except your receipt of raisins, which is the only food that the stomach will bear. . .

We were becalmed for a day between Teneriffe and the Grand Canary, and here I first experienced any enjoyment. The view was glorious. The Peak of Teneriffe was seen amongst the clouds like another world. Our only drawback was the extreme wish of visit-

ing this glorious island. *Tell Eyton never to forget either the Canary Islands or South America*; that I am sure it will well repay the necessary trouble, but that he must make up his mind to find a good deal of the latter. I feel certain he will regret it if he does not make the attempt. From Teneriffe to St. Jago the voyage was extremely pleasant. I had a net astern the vessel which caught great numbers of curious animals, and fully occupied my time in my cabin, and on deck the weather was so delightful and clear, that the sky and water together made a picture. On the 16th we arrived at Port Praya, the capital of the Cape de Verds, and there we remained twenty-three days, viz., till yesterday, the 7th of February. The time has flown away most delightfully, indeed nothing can be pleasanter; exceedingly busy, and that business both a duty and a great delight. I do not believe I have spent one-half hour idly since leaving Teneriffe. St. Jago has afforded me an exceedingly rich harvest in several branches of Natural History. I find the descriptions scarcely worth anything of many of the commoner animals that inhabit the Tropics. I allude, of course, to those of the lower classes.

Geologising . . .

Geologising in a volcanic country is most delightful; besides the interest attached to itself, it leads you into most beautiful and retired spots. Nobody but a person fond of Natural History can imagine the pleasure of strolling under cocoa-nuts in a thicket of bananas and coffee-plants, and an endless number of wild flowers. And this island, that has given me so much instruction and delight, is reckoned the most uninteresting place that we perhaps shall touch at during our voyage. It certainly is generally very barren, but the valleys are more exquisitely beautiful, from the very contrast. It is utterly useless to say anything about the scenery; it would be as profitable to explain to a blind man colours, as to a person who has not been out of Europe, the total dissim-

ilarity of a tropical view. Whenever I enjoy anything, I always either look forward to writing it down, either in my log-book (which increases in bulk), or in a letter; so you must excuse raptures, and those raptures badly expressed. I find my collections are increasing wonderfully, and from Rio I think I shall be obliged to send a cargo home.

Sufferings of Sea-sickness . . .

All the endless delays which we experienced at Plymouth have been most fortunate, as I verily believe no person ever went out better provided for collecting and observing in the different branches of Natural History. In a multitude of counsellors I certainly found good. I find to my great surprise that a ship is singularly comfortable for all sorts of work. Everything is so close at hand, and being cramped makes one so methodical, that in the end I have been a gainer. I already have got to look at going to sea as a regular quiet place, like going back home after staying away from it. In short, I find a ship a very comfortable house, with everything you want, and if it was not for sea-sickness the whole world would be sailors. I do not think there is much danger of Erasmus setting the example, but in case there should be, he may rely upon it if he does not know one-tenth of the sufferings of sea-sickness.

I like the officers much more than I did at first, especially Wickham, and young King and Stokes, and indeed all of them. The Captain continues steadily very kind, and does everything in his power to assist me. We see very little of each other when in harbour, our pursuits lead us in such different tracks. I never in my life met with a man who could endure nearly so great a share of fatigue. He works incessantly, and when apparently not employed, he is thinking. If he does not kill himself, he will during this voyage do a wonderful quantity of work. I find I am very well, and stand the little heat we have had as yet as well as anybody. We shall soon have it in real earnest. We are now sailing for Fernando Noronha, off the coast of Brazil, where we shall not stay very long, and then examine the shoals be-

tween there and Rio, touching perhaps at Bahia. I will finish this letter when an opportunity of sending it occurs.

February 26th.—About 280 miles from Bahia. On the 10th we spoke the packet *Lyra*, on her voyage to Rio. I sent a short letter by her, to be sent to England on [the] first opportunity. We have been singularly unlucky in not meeting with any homeward-bound vessels, but I suppose [at] Bahia we certainly shall be able to write to England. Since writing the first part of [this] letter nothing has occurred except crossing the Equator, and being shaved. This most disagreeable operation consists in having your face rubbed with paint and tar, which forms a lather for a saw which represents the razor, and then being half drowned in a sail filled with salt water. About 50 miles north of the line we touched at the rocks of St. Paul; this little speck (about $\frac{1}{4}$ of a mile across) in the Atlantic has seldom been visited. It is totally barren, but is covered by hosts of birds; they were so unused to men that we found we could kill plenty with stones and sticks. After remaining some hours on the island, we returned on board with the boat loaded with our prey. From this we went to Fernando Noronha, a small island where the [Brazilians] send their exiles. The landing there was attended with so much difficulty owing [to] a heavy surf that the Captain determined to sail the next day after arriving. My one day on shore was exceedingly interesting, the whole island is one single wood so matted together by creepers that it is very difficult to move out of the beaten path. I find the Natural History of all these unfrequented spots most exceedingly interesting, especially the geology. I have written this much in order to save time at Bahia.

A Graceful Lightness . . .

Decidedly the most striking thing in the Tropics is the novelty of the vegetable forms. Cocoa-nuts could well be imagined from drawings, if you add to them a graceful lightness which no European tree partakes of. Bananas and plantains are exactly the same as those in hothouses, the acacias or tamarinds are striking from the blueness of their foliage; but of the glorious orange trees, no description, no drawings, will give any just idea; instead of the sickly green of our oranges, the native ones exceed the Portugal laurel in the darkness of their tint, and infinitely exceed it in beauty of form. Cocoa-nuts, papaws, the light green bananas, and or-

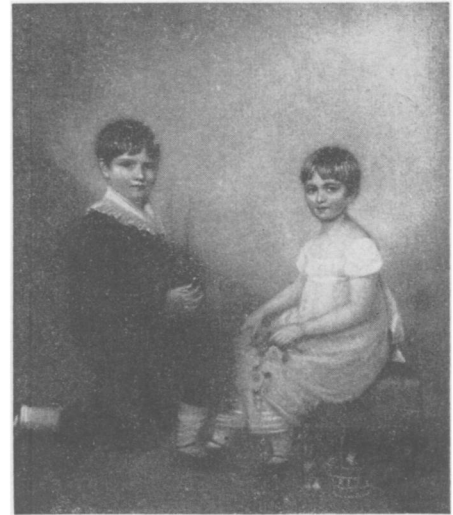
anges, loaded with fruit, generally surround the more luxuriant villages. Whilst viewing such scenes, one feels the impossibility that any description should come near the mark, much less be overdrawn.

San Salvador . . .

March 1st.—Bahia, or San Salvador. I arrived at this place on the 28th of February, and am now writing this letter after having in real earnest strolled in the forests of the new world. No person could imagine anything so beautiful as the ancient town of Bahia, it is fairly embosomed in a luxuriant wood of beautiful trees, and situated on a steep bank, and overlooks the calm waters of the great bay of All Saints. The houses are white and lofty, and, from the windows being narrow and long, have a very light and elegant appearance. Convents, porticos, and public buildings, vary the uniformity of the houses; the bay is scattered over with large ships; in short, and what can be said more, it is one of the finest views in the Brazils. But the exquisite glorious pleasure of walking amongst such flowers, and such trees, cannot be comprehended but by those who have experienced it. Although in so low a latitude the locality is not disagreeably hot, but at present it is very damp, for it is the rainy season. I find the climate as yet agrees admirably with me; it makes me long to live quietly for some time in such a country. If you really want to have [an idea] of tropical countries, study Humboldt. Skip the scientific parts, and commence after leaving Teneriffe. My feelings amount to admiration the more I read him. Tell Eyton (I find I am writing to my sisters!) how exceedingly I enjoy America, and that I am sure it will be a great pity if he does not make a start.

This letter will go on the 5th, and I am afraid will be some time before it reaches you; it must be a warning how in other parts of the world you may be a long time without hearing. A year might by accident thus pass. About the 12th we start for Rio, but we remain some time on the way in sounding the Albrohosh shoals. Tell Eyton as far as my experience goes let him study Spanish, French, drawing, and Humboldt. I do sincerely hope to hear of (if not to see him) in South America. I look forward to the letters in Rio—till each one is acknowledged, mention its date in the next.

We have beat all the ships in manoeuvring, so much so that the commanding officer says, we need not follow his



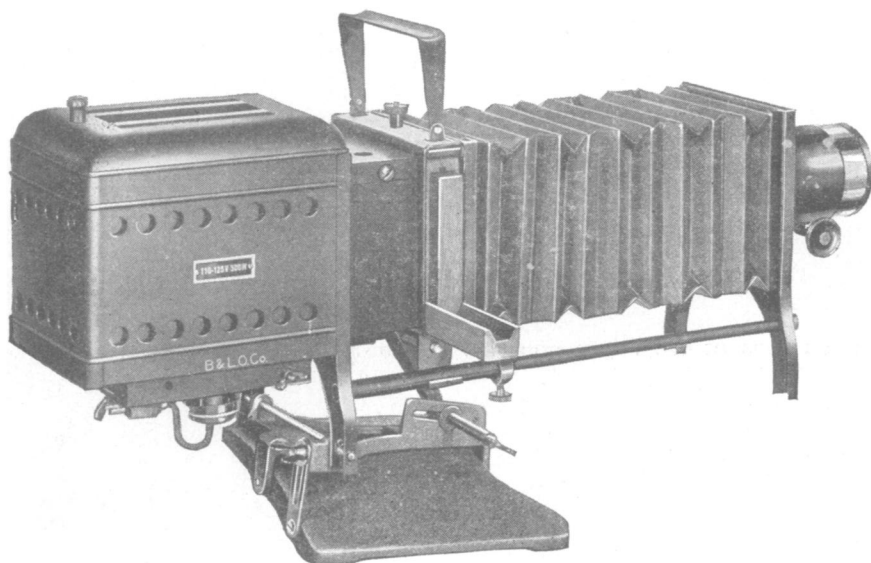
CHARLES DARWIN

Aged 7, with his sister Catherine, aged 6. He had also three older sisters and an older brother.

example; because we do everything better than his great ship. I begin to take great interest in naval points, more especially now, as I find they all say we are the No. 1 in South America. I suppose the Captain is a most excellent officer. It was quite glorious today how we beat the *Samarang* in furling sails. It is quite a new thing for a "sounding ship" to beat a regular man-of-war; and yet the *Beagle* is not at all a particular ship. Erasmus will clearly perceive it when he hears that in the night I have actually sat down in the sacred precincts of the quarter deck. You must excuse these queer letters, and recollect they are generally written in the evening after my day's work. I take more pains over my log-book, so that eventually you will have a good account of all the places I visit. Hitherto the voyage has answered *admirably* to me, and yet I am now more fully aware of your wisdom in throwing cold water on the whole scheme; the chances are so numerous of turning out quite the reverse; to such an extent do I feel this, that if my advice was asked by any person on a similar occasion, I should be very cautious in encouraging him. I have not time to write to anybody else, so send to Maer to let them know, that in the midst of the glorious tropical scenery, I do not forget how instrumental they were in placing me there. I will not rapturise again, but I give myself great credit in not being crazy out of pure delight.

Give my love to every soul at home, and to the Owens.

I think one's affections, like other



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good things, flourish and increase in these tropical regions.

The conviction that I am walking in the New World is even yet marvellous in my own eyes, and I dare say it is little less so to you, the receiving a letter from a son of yours in such a quarter.

Believe me, my dear Father,
Your most affectionate son,
CHARLES DARWIN.

Science News Letter, December 19, 1931

ENGINEERING

Wear on Tires Measured By Use of Depth Gages

RESearch to determine the amount of rubber eaten from automobile tires by hungry highway surfaces during carefully controlled test runs was reported to the Highway Research Board of the National Research Council meeting at Washington by A. A. Anderson and H. B. Wright, highway engineers of Chicago.

Sensitive gages used to measure the decreasing depth of the tire tread proved to be the most accurate means of checking wear. The tires were also weighed at the end of every thousand miles, but this method of determining the loss of rubber proved ineffective because the tire weight varies with weather conditions such as temperature and humidity. The engineers found that data on front wheel tires varied so much that the figures were worthless while readings on the rear wheels remained uniform.

From runs of more than 3,000 miles on non-skid asphaltic concrete and on Portland cement concrete it was found that the tires wore less on Portland cement than on the asphaltic pavement, the report stated. To get uniform wear Mr. Wright and Mr. Anderson increased tire pressure four pounds per square inch above the recommendation of the Tire and Rim Association.

Other conclusions show that increase in temperature from early morning to noon may be enough to swell balloon tires and make a car that ran smoothly at eight o'clock bounce uncomfortably at twelve.

Science News Letter, December 19, 1931

American chestnut trees, which have been so widely destroyed by fungus blight, appear to be developing resistance, since new shoots from roots of trees killed by the fungus are growing rapidly and even producing fair-sized crops of chestnuts.