

# The Beagle Record

EDITED BY R.D. KEYNES





# *The Beagle Record*

*Selections from the original pictorial  
records and written accounts of the  
voyage of H.M.S. Beagle*

EDITED BY R.D. KEYNES



Port. Beagle -  
Dec. 25. 1833 -

no further aft -



An account of the voyage of H.M.S. *Beagle* round the world in 1831-36, taken from the letters of Darwin and FitzRoy, Darwin's diary, and the books about the voyage published by Darwin and FitzRoy in 1839. It is illustrated chiefly by the pencil drawings and water-colours made by the *Beagle's* official artist, Conrad Martens, but pictures made on board by other members of the crew are also included.

The bulk of the illustrations are previously unpublished, as are the letters written by Captain FitzRoy and Conrad Martens. Most of the other written sources are currently out of print.

The book tells the story of the voyage of the *Beagle* in the words of the participants as recorded at the time, and illustrates it with a selection from the original pictorial records.

*Jacket illustration: Christmas Day at Port Desire by Conrad Martens, reproduced by permission of the Syndics of the University Library, Cambridge.*



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*Edited by* RICHARD DARWIN KEYNES  
M.A., SC.D., F.R.S.



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TO  
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# Preface

Enough has been written about the voyage of H.M.S. *Beagle* round the world in 1831–6 to make it seem an unpromising topic for yet another book. My excuse for producing one arose from a chance encounter in Buenos Aires during the summer of 1968 with Dr Armando Braun Menendez, whose extensive collection of books, manuscripts and pictures related to the exploration of the southern hemisphere turned out to include two of the original sketchbooks used by Conrad Martens during his nine months as the *Beagle*'s official artist. The excellence of the drawings as a topographical record was at once apparent, but more important was the immediacy of their portrayal of life on board the *Beagle*. One could not but be stirred by the picture painted by Martens when the crew went ashore at Port Desire in December 1833, and spent what the Captain described as 'a very cheerful Christmas Day' engaged in sports and games like slinging the monkey. The vividness of the scene, with a group of men standing round the 'monkey' suspended from a tripod, a member of the crew having temporarily been substituted for the keg of rum, and *Beagle* and *Adventure* at anchor in the background, is striking; and its authenticity is brought home by the initials R. F. in the top right corner, though the pencilled notes below show that FitzRoy was not entirely happy with the artist's positioning of the *Beagle*'s masts. But these were early days for Martens, and no fault was found with later pictures of the ship. Again, how interesting to see the white sands of Botofogo Bay in Rio, now alas a multi-lane super-highway, where Darwin once shared a cottage with Martens's predecessor, Augustus Earle, and Miss Fuegia Basket, 'who daily increases in every direction except height'. And how sad are the exquisite pencil drawings of the temperate rain forest in Chiloe, long since vanished under the axe and saw, where in the *Beagle*'s time the explorers' feet could not touch the ground for fallen tree trunks.

These exciting pictures seemed to me to deserve to be better known. And there were others, for Dr Braun Menendez also had in his possession a manuscript catalogue by the late Professor David James of some 150 extant drawings and watercolours made by Martens on the *Beagle*. This list, later published in a Spanish translation,<sup>1</sup> gave me an invaluable start towards producing the more complete one included here. On returning home, I consulted Nora Barlow, editor of the diary kept by Darwin on the *Beagle*, and of his letters to his family and to Professor

<sup>1</sup>James (1971).



Henslow. With her interest and enthusiastic support, *The Beagle Record* was born.

During the period that he spent on the *Beagle*, the practice normally adopted by Martens was to make pencil studies and sometimes watercolours in a series of sketchbooks that he carried with him in the field. Two or three such sketchbooks were evidently in use at any one time, so that there is an appreciable overlap in the dates of the drawings. Four sketchbooks numbered on their covers I, II, III and IV were subsequently given by Martens to a favourite pupil, Mrs Macarthur Onslow, and remained for many years in the possession of her descendants at Camden Park, near Sydney. Through the cooperation of Dr Braun Menendez and the generosity of Nora Barlow, Sketchbooks I and III have now joined the Darwin papers in the Cambridge University Library. Sketchbooks II and IV are still at Camden Park, together with a number of loose drawings. There are also some smaller sketchbooks in the Dixson Library in Sydney.

The majority of these studies were carefully labelled and dated, and colour values and other details were noted by Martens so that accurate watercolours could be developed from them at his leisure. When submitted to FitzRoy for his approval, they were initialled RF in the top righthand corner if they passed muster. A few of which copies were also required for the chart makers at the Hydrographical Office in London were marked H.O. At some later date, those that served to illustrate Volumes 1 and 2 of the *Narrative of the Surveying Voyages of His Majesty's Ships Adventure and Beagle between the years 1826 and 1836*, were marked in another hand with the page on which they appeared; page references were also noted on a few drawings of which engravings were not actually made. Almost all of the published engravings were made from watercolour developments of the pencil studies, which were sent to London while the sketchbooks stayed in Australia. These watercolours were retained by FitzRoy, and eventually passed from his son Robert and his daughter Laura to members of the Smyth family. Those that are now in the National Maritime Museum at Greenwich were presented to the museum by the Misses Smyth. In a number of instances, Martens painted more than one version of the same scene with minor variations. He continued to produce these variants in Sydney long after he settled there in 1835; of the few that are dated, one was executed as late as 1872.

One of Martens's official duties on the *Beagle* was to produce coastal silhouettes for the chart makers, and 19 of them are now preserved in the archives of the Hydrographic Department of the Ministry of Defence at Taunton. With them are dozens of others painted by Augustus Earle, Lieutenant J. C. Wickham, Midshipman P. G. King and FitzRoy himself, but apart from a fine watercolour view of Coquimbo by FitzRoy, they are not sufficiently interesting to merit reproduction. The bulk of them depict the coasts of Patagonia, Tierra del Fuego and Chile, and there are relatively few for the latter part of the voyage. When the *Beagle* was in the Galapagos Islands, P. G. King made some drawings that were engraved in Volume 2 of the *Narrative*; these are in the naval archives, and include an attractive watercolour of Charles Island that I have reproduced here. As will be painfully apparent from the two little sketches that are among the papers in the Cambridge University Library, Darwin was no draughtsman. His assistant, Syms



Covington, was more competent in this direction, and I have chosen two of his pictures from the collection belonging to the Linnean Society of New South Wales that is lodged in the Mitchell Library.

So much for the pictorial material. For the accounts of the voyage written on the spot, we are mainly dependent on Darwin, whose notebooks, diary and family letters are all at Down House. His first impressions were jotted down in note form in a series of 18 small notebooks. As may be seen from the transcriptions published by Nora Barlow in *Charles Darwin and the voyage of the Beagle*, this record was intended to refresh his own memory rather than serve as a coherent description of what he saw and did. It is therefore much less readable than the diary that he wrote as soon as he had time to spare, generally within a week of the event, but sometimes after a longer lapse of time. Completed sections were sent home at intervals to his family, and faithfully preserved by them, so that the manuscript survives in its entirety, together with three copies typed for Sir Horace Darwin in 1891. In order to produce those parts of Volume 3 of the *Narrative* concerned with his daily activities, Darwin printed verbatim or with some condensation about two thirds of the diary. The scientific detail and discussion in the *Narrative* was drawn from the geological, zoological and ornithological notes that he kept separately. Since my primary concern in *The Beagle Record* is to provide a general narrative of events, I have taken my material mainly from Nora Barlow's edition of *Charles Darwin's Diary of the Voyage of H.M.S. Beagle*, and have resisted the temptation to include more than a few representative passages from the *Narrative*. However, Darwin's volume of the *Narrative* has reappeared in numerous editions as *Journal of Researches into the Natural History and Geology of the Countries visited during the Voyage of H.M.S. Beagle round the World under the Command of Capt. FitzRoy, R.N.*, and so is readily accessible to the reader. The manuscript Diary contains 189,000 words, of which I have space for no more than a quarter, chosen in what must be in places a somewhat arbitrary fashion.

Often the most graphic account of the *Beagle's* doings is contained in Darwin's letters to his father and sisters, all of which are included here. They have previously been published by Nora Barlow in *Charles Darwin and the voyage of the Beagle*, but I found the task of reading the originals so enjoyable that I have produced a fresh transcript, and have corrected a few unimportant errors in her edition. I have preserved Darwin's occasionally idiosyncratic spelling throughout, but in the interests of readability have not always adhered to his rather erratic punctuation, and have introduced some paragraphing of my own. These letters were generally not concerned with Darwin's scientific activities, which he described in a separate series of letters to Henslow. Extracts from some of them were privately printed by Henslow for members of the Cambridge Philosophical Society, and they were first published in full by Nora Barlow in *Darwin and Henslow: The Growth of an Idea*. Again, I have broken some of them up into shorter paragraphs, but otherwise have used Nora Barlow's edition as it stands. In all the letters printed here, editorial additions or amendments are shown in square brackets.



Only one short section of FitzRoy's original diary has survived, so that for his side of the story we are mainly dependent on Volume 2 of the *Narrative*, written after the *Beagle's* return to England, and inevitably lacking in freshness of impact. But unlike Darwin's volume, it was never reprinted after its original publication in 1839, and so is undeservedly much less familiar to the general public. FitzRoy's literary style is less felicitous than Darwin's, but it nevertheless seems only right to allow him to tell the tale on the subjects on which he was the authority, or felt most strongly, such as the weather and the handling of the ship, the disposition of the Fuegians, the changes in the levels of the land after the great earthquake of 1835, the negotiations with Queen Pomare in Tahiti, the way in which New Zealand might be governed, and even the vexed question of reconciling the biblical account of the Flood with the scientific evidence. The extant letters written by FitzRoy on the *Beagle*, most of which are published here for the first time, comprise a series to Captain Beaufort at the Hydrographical Office in London, and two written to Darwin in 1833 when he was on shore, which afford a vivid glimpse of the relationship between the two men. These have been handled editorially in the same way as the Darwin letters.

For completeness' sake, extracts have been included from several subsidiary written sources, namely an account written by Philip Gidley King for the publisher Murray in 1890, the manuscript journal kept by Syms Covington, and some letters from B. J. Sullivan that appear in the biography written by his son.

The economics of publishing coloured illustrations are such that this book would never have seen the light of day without generous financial assistance from the Pilgrim Trust, the Lady Nora Barlow National Heritage Trust, Dr Armando Braun Menendez, the Ernest Cook Trust, the Radcliffe Trust, and the Darwin Fund of the Royal Society. I am very grateful to them all.

I wish to acknowledge the courteous assistance I have received from the staffs of all the institutions where the source material for *The Beagle Record* is kept, that is to say Cambridge University Library, the Down House Museum, the Print Room of the British Museum, the National Maritime Museum, the Hydrographic Department of the Royal Navy, the Mitchell and Dixson Libraries, the National Library of Australia, the National Gallery of Victoria, and the City Museum of Montevideo. For permission to reproduce copyright material, manuscripts and pictures in their collections, I am indebted to these institutions, and to the Linnean Society of New South Wales, the Bentham-Moxon Trust, Mr George Darwin, Mr Quentin Stanham, Sir Geoffrey Keynes, Mrs R. G. Barnet, and above all to Mr Mark Smyth.

Many individuals have helped me in ways too various to specify. In particular, I am deeply indebted to Senhor Octavio Assunção, Mr A. L. Gallup, Mr Peter Gautrey, Miss Rosemary Graham, Miss Suzanne Mourot, Miss M. J. Perry, Dr Sydney Smith, Mr Mark Smyth, Miss Mollie Smyth, Mr David Stanbury, Mr Quentin Stanham, and Mrs Margaret Twinn. Whenever my standards of historical scholarship showed signs of slipping, Dr Simon Keynes stepped in and kept me up to the mark; in so doing, he made a number of important contributions to the book.



## Introduction

The artist originally appointed as the official recorder of the topography of the places to be visited by the *Beagle* was Augustus Earle. Born in 1793, and therefore one of the oldest men on board, Earle was the son of an American painter, James Earl (1761–96), who had settled for a while in England. After a period of formal training in London, possibly in the studio of Benjamin West, Augustus Earle had spent twenty years giving full rein to an ambition to record the scenery in remote places previously unvisited by any artist. In 1815–17 he had thoroughly explored the shores of the Mediterranean in a naval gunboat; in 1818–24 he visited in turn the United States, Chile, Peru and Brazil; in 1824 he stayed for nine months in Tristan da Cunha; during 1825–8 he was established in Sydney, and made some of the earliest pictures of parts of New South Wales; and towards the end of this time he made a visit of six months to New Zealand. Always in search of fresh targets for his brush, he left Australia northward bound in October 1828, passed through the Caroline islands, Guam, Manila, Singapore and Penang, and came to rest once more in Madras. However, the climate of India proved too much for his health, and he was soon obliged to return to England, not neglecting an opportunity to spend a short while recording panoramic views in Mauritius when held up there in the course of his voyage home.

With this background, Earle was a natural choice for an appointment which FitzRoy described as follows: 'Knowing well that no one actively engaged in the surveying duties on which we were going to be employed, would have time – even if he had ability – to make much use of the pencil, I engaged an artist, Mr Augustus Earle, to go out in a private capacity; though not without the sanction of the Admiralty, who authorized him also [i.e. in addition to Darwin] to be victualled.' Already when the *Beagle* reached Rio de Janeiro in May 1832, Earle's health was troubling him again, and Darwin noted that he was suffering agonies from rheumatism, though after a fortnight on shore in their cottage he was nearly well. He was still on board the ship when she visited Bahia Blanca in August 1832, but had to stay behind in Montevideo when she sailed for Tierra del Fuego in December. Although he remained there until the *Beagle* returned from the south the following year, he was never fit enough to rejoin her. He made his way back to England, and died in London on 10 December 1838.

Earle's enforced absence from the *Beagle* during that first visit to Tierra del Fuego was a pity, for he was the best figure painter on board at any time, and might perhaps have left us some less unflattering portraits of the Fuegians and



Patagonians than those of FitzRoy, P. P. King and Martens. As it turned out, his share in the pictorial record of the voyage was restricted to a lively sketch of the ceremony of 'Crossing the Line', and some attractive pictures of Bahia, Rio de Janeiro and Montevideo. Efforts to trace the present whereabouts of the original watercolours having failed, only one or two of the engravings made of them can be reproduced here. Of Earle's personality there is little evidence beyond Darwin's references in letters to his 'eccentric character', and later on to his 'open licentiousness'. However, on reading the passages in Earle's book<sup>1</sup> that so roused the indignation of FitzRoy and Darwin, one suspects that today his behaviour would have been described in milder terms.

Fortunately, a replacement for Earle was readily found. Conrad Martens had left England in May 1833 on a three-year cruise to India at the invitation of Captain Blackwood of H.M.S. *Hyacinth*. On reaching Rio de Janeiro two months later, Martens learnt of the *Beagle*'s loss of her official artist, and immediately set off for Montevideo to offer his services to FitzRoy. He made a good impression, and early in October FitzRoy was describing him enthusiastically to Darwin. But the *Beagle* was not yet ready to sail, and Martens remained on shore until the beginning of December, his first drawing actually made on board the ship being the superb panorama from her anchorage dated 4 December 1833. His period of service on the *Beagle* lasted only nine months, for when in August 1834 she arrived in Valparaiso, where FitzRoy was obliged to dispose of the *Adventure*, there was no longer a cabin to spare for him, and in Darwin's words 'it is necessary also to leave our little painter, Martens, to wander about the world'. However, he was a prolific worker, and his output of pencil drawings and watercolours during these months constitutes much the greatest part of the pictorial record left to us of the voyage of the *Beagle*.

Conrad Martens was born at Crutched Friars, near the Tower, in 1801, son of a German, J. C. H. Martens, who came to London as Austrian consul, married an Englishwoman, and settled in England as a merchant. Pursuing, like his brothers Henry and J. W. Martens, a fixed ambition to become a painter, he studied landscape-painting under Copley Fielding (1789-1855). After the death of his father in 1816, his mother moved to Devonshire, and his earliest extant pictures are mainly Devon landscapes. By 1833 he had acquired considerable proficiency as a topographical artist, and was just the man that FitzRoy needed to fill the gap in the *Beagle*'s complement. From the strictly parochial point of view of *The Beagle Record*, his dismissal in Valparaiso was regrettable, for although the *Beagle*'s captain and several of her officers were watercolourists of no mean ability, their official duties left them little time for artistic exercises, and there are very few pictures to illustrate the final two years of the voyage. But the course of Martens's subsequent wanderings was such that the art history of the South Pacific was thereby very much the gainer. After spending several months in Valparaiso, some of them in the company of another talented travelling artist, J. M. Rugendas (1799-1858), Martens embarked on 3 December 1834 on a schooner bound for Tahiti, the *Peruvian*. Here he remained for seven weeks and made a number of

<sup>1</sup> See McCormick (1966).



sketches, one or two of which were later borrowed by FitzRoy to illustrate the second volume of the *Narrative*, for the *Beagle* visited some of the same places nearly a year later. On 4 March 1835 Martens shipped out on the *Black Warrior*, and sailed by way of the Bay of Islands in New Zealand to Sydney, where he disembarked on 17 April 1835. By the time the *Beagle* reached Sydney the following January, Martens had already amassed a substantial portfolio of sketches of the surrounding country, and had begun to take pupils. Darwin and FitzRoy visited him, and he recorded<sup>1</sup> that on 17 and 21 January he sold Darwin a *View, Ponsonby Sound and River Santa Cruz* for 3 guineas each, while on 28 January FitzRoy paid him 2 guineas for *View at Moorea*. In 1837 he married Jane Brackenbury Carter, and until he died in 1878 supported his wife and two daughters on the sale of his paintings and lithographs, and by teaching. His contribution to the recording of the Australian scene in the first half of the nineteenth century was a notable one.

The pictures reproduced in this volume can attest to Martens's capability as a topographical artist. His pencil drawings, in particular, exhibit a splendid sureness of touch, whether they portray distant landscapes or are detailed studies of plants and trees. In a lecture on the technique of landscape painting,<sup>2</sup> he advocated the exclusive use of just four strengths of pencil line, and deplored hatching because of its slowness. Mrs Macarthur Onslow, whom he taught, and to whom we owe the preservation of his *Beagle* sketchbooks, left it on record that he never lifted pencil from paper, so fast did he work. It would be difficult to claim on the basis of his *Beagle* pictures that his art showed any marked development in those few months, but some things he must have learnt during the voyage. It is not hard to discern the influence of Darwin in the notes from Lyell's *Principles of Geology* that are to be found in one of the sketchbooks in the Dixson Library; and he must surely have discussed cloud structures with FitzRoy. Perhaps it was on the *Beagle* that he acquired his lifelong interest in telescopes, to which reference is made in a letter<sup>3</sup> written to Darwin many years later:

St Leonards, Sydney. Jan. 20th/62

To Chas Darwin Esq.,

Many thanks, my old shipmate, for your kind message which I have just recd by the packet. I thought you had quite forgotten that I was in existence, and certainly the man who voluntarily sets himself down in such a place as this has no right to grumble if he [finds] such to be the case. As it appears, however, you have still two of my sketches hanging up in your room, I hope you will not refuse to accept another which I shall have much pleasure in preparing, and will send to you by the next mail.

Your 'book of the season', as the reviewers have it, I must own I have not yet read, altho Mr Clarke offered to lend it me. I am afraid of your eloquence, and I don't want to think I have an origin in common with toads and tadpoles, for if there is anything in human nature that I hate it is a toady. But of course I know nothing of the subject, and they do make such microscopes nowadays – I suppose yours is one of Ross's very best. By the by, I got him to make two eyepieces for a reflecting telescope just before

<sup>1</sup>'Account of Pictures painted at Sydney, N. S. Wales'. Dixson Library, CY MS142.

<sup>2</sup>Quoted in full by Lionel Lindsay (1968). <sup>3</sup>Cambridge University Library, Darwin MSS.



he died, as I had succeeded in casting and polishing two metals of 6 and 7 feet focus. And so now I show the good people here the mountains in the moon turned upside down, as of course they ought to be when seen from the antipodes. But I must apologise, for I suppose you don't laugh at nonsense now as you used to do in 'Beagle', or rather I suppose it does not come in your way.

Well, that was a jolly cruize, and I hope you have been well and happy ever since – and that you may continue so for some time to come is, Believe me, the sincere wish of your old shipmate,

Conrad Martens

P.S. I wonder whether the Admiral 'what is now' [is well]. I should like to send my kind regards, if you should see him, but don't if you don't like; coffee without sugar! – you remember.

The two main protagonists in the voyage of the *Beagle* stand less in need of introduction to the reader than Earle and Martens; but some biographical details may help to fill in their background. Robert FitzRoy was a member of an aristocratic family, being a grandson of the Duke of Grafton and a nephew of Lord Castlereagh. He was born at Ampton Hall in Suffolk on 5 July 1805, and after preliminary schooling at Harrow, entered the Royal Naval College at Portsmouth in February 1818. He soon proved himself academically outstanding, gaining the College Medal and the Mathematics Prize in 1819, and passing first in his examination for lieutenant in 1824. He sailed to South America for the first time as a 'college volunteer' on H.M.S. *Owen Glendower*, became a midshipman a year later, and saw service in the English Channel and the Mediterranean on H.M.S. *Hind*. In 1824 he joined H.M.S. *Thetis* as a lieutenant, and served with her in the same waters until 1828, when he transferred to H.M.S. *Ganges* as flag lieutenant to the Commander-in-Chief of the South American Station, Admiral Sir Robert Otway. This appointment did not last for long, because in October of that year Captain Philip Parker King sailed into the harbour at Rio de Janeiro with H.M.S. *Adventure* and *Beagle* to report that the captain of the *Beagle*, exhausted and depressed by the trials of surveying the stormy and desolate coast of Tierra del Fuego, had shot himself. Overruling Captain King's request that the first lieutenant of the *Beagle* should take over the command, the Admiral gave it instead to FitzRoy.

At the age of 23, FitzRoy thus became captain of a ten-gun brig engaged on 'an accurate survey' of the southern coasts of South America, from the River Plata on the east side of the continent to the Island of Chiloe on the west. His ability as a seaman was quickly put to the test by a storm of exceptional severity in the mouth of the River Plata (see p.71), but he brought the *Beagle* through it with some damage to her masts and spars, and the loss of two men overboard. The first task allotted to him by Captain King was to explore some unknown parts of the Straits of Magellan, and that completed, to chart the whole coast of Tierra del Fuego. In performing this second mission, he found himself badly hampered by the propensity of the natives to steal anything portable; but when he countered by taking hostages for the theft of his whaleboats, he found that the Fuegians preferred to retain their booty, leaving him with their comrades on his hands.



Thus it was that he acquired the Fuegians named York Minster, Boat Memory, James Button and Fuegia Basket, and becoming passionately interested in their welfare, conceived the idea of taking them back to England to be educated for a year or two and then returned to Tierra del Fuego to pass on the benefits of civilization to their people. And in October 1830 the *Beagle* docked at Plymouth with her unique cargo.

One of the Fuegians, Boat Memory, succumbed soon afterwards to an attack of smallpox, but with the aid of the rector of Walthamstow the education of the other three was duly set under way. In the summer of 1831, FitzRoy was summoned to show his Fuegians to the King and Queen, who expressed their gracious approval of his plans. The Lords of the Admiralty were, however, not entirely sympathetic with the idea that the navy should be responsible for returning the newly educated hostages to their native land, and FitzRoy was obliged to ask for twelve months' leave of absence so that he could charter a boat at his own expense to take them back to Tierra del Fuego. This was granted, but did not have to be put into effect, because under pressure from FitzRoy's influential relatives, their lordships were in the end persuaded to reappoint him to the command of the *Beagle*, so that the repatriation of the Fuegians could be combined with a continuation of the survey of the coast of South America. Their decision turned out to be a wise one, though they can hardly have anticipated the consequences that would flow from it!

It was standard practice for naval vessels dispatched on this kind of mission to combine their hydrographic work with general scientific investigations. Among the instructions given by the Admiralty to Captain P. P. King for the activities of the *Adventure* and *Beagle* in 1828-30 were: 'You are to avail yourself of every opportunity of collecting and preserving Specimens of such objects of Natural History as may be new, rare, or interesting; and you are to instruct Captain Stokes,<sup>1</sup> and all the other Officers, to use their best diligence in increasing the Collections in each ship: the whole of which must be understood to belong to the Public.' Captain King accordingly included a botanical collector in the crew of the *Adventure*, only to be disappointed later when the British Museum failed to take any interest in his collection of plants from Tierra del Fuego. On returning from South America in 1830, FitzRoy had written:<sup>2</sup>

'There may be metal in many of the Fuegian mountains, and I much regret that no person in the vessel was skilled in mineralogy, or at all acquainted with geology. It is a pity that so good an opportunity of ascertaining the nature of the rocks and earths of these regions should almost have been lost. I could not avoid often thinking of the talent and experience required for such scientific researches, of which we were wholly destitute; and inwardly resolving that if ever I left England again on a similar expedition, I would endeavour to carry out a person qualified to examine the land; while the officers and myself would attend to hydrography.'

<sup>1</sup>Captain Pringle Stokes of the *Beagle*, who came to a tragic end in 1828; he was not related to John Lort Stokes, assistant surveyor on the *Beagle*'s second voyage.

<sup>2</sup>See de Beer (1963) p.22.



When the *Beagle* was recommissioned in 1831, FitzRoy therefore

'proposed to the Hydrographer that some well-educated and scientific person should be sought for who would willingly share such accommodations as I had to offer, in order to profit by the opportunity of visiting distant countries yet little known. Captain Beaufort approved of the suggestion, and wrote to Professor Peacock, of Cambridge, who consulted with a friend, Professor Henslow, and he named Mr Charles Darwin, grandson of Dr Darwin the poet, as a young man of promising ability, extremely fond of geology, and indeed all branches of natural history. In consequence an offer was made to Mr Darwin to be my guest on board, which he accepted conditionally; permission was obtained for his embarkation, and an order given by the Admiralty that he should be borne on the ship's books for provisions. The conditions asked by Mr Darwin were, that he should be at liberty to leave the *Beagle* and retire from the Expedition when he thought proper, and that he should pay a fair share of the expenses of my table.'

Darwin can be left to tell in his own words (see p.15) how he came to accept FitzRoy's offer; but further consideration must be given to FitzRoy's motives for making it. In several recent accounts,<sup>1</sup> it has been stated categorically that FitzRoy intended his geologist to provide evidence that would establish once and for all the literal truth of the story of the Creation contained in the Bible. While there are ample indications that he was deeply distressed when his protégé eventually did just the reverse, there seems little doubt that his fundamentalist views were not in fact fully developed until soon after the end of the voyage of the *Beagle*, and that he did not hold them at the time of their departure for South America. In the final chapter of the second volume of the *Narrative* (see pp.368–82), in which he attempts to reconcile the biblical account of the Flood with the geological evidence by an extraordinary combination of arguments that are not unreasonable with others that are palpably absurd, the following passage occurs:

'While led away by sceptical ideas, and knowing extremely little of the Bible, one of my remarks to a friend, on crossing vast plains composed of rolled stones bedded in diluvial detritus some hundred feet in depth, was 'this could never have been effected by a forty days' flood' – an expression plainly indicative of the turn of mind, and ignorance of Scripture. I was quite willing to disbelieve what I thought to be the Mosaic account, upon the evidence of a hasty glance, though knowing next to nothing of the record I doubted – and I mention this particularly, because I have conversed with persons fond of geology, yet knowing no more of the Bible than I knew at that time.'

The friend in question was evidently Darwin, and the occasion was their expedition up the Rio Santa Cruz. Hence on FitzRoy's own showing he had not in 1834, and still less so in 1831, adopted the inflexible position that he had come to take up by the time he completed his book in 1838. During the voyage itself, it seems probable that it was Darwin, the former theological student, and not FitzRoy, the naval officer with practical objectives at the front of his mind, who

<sup>1</sup> See de Beer (1963) p.23; Mellersh (1968) p.73; Moorehead (1969) p.37; Chancellor (1973) p.90.



was the firmer believer in the absolute truth of the first book of Genesis.

FitzRoy's subsequent career was a distinguished one, although marred by the manic-depressive tendencies already apparent during the voyage of the *Beagle*. The tasks of writing his share of the *Narrative*, and of editing the charts and sailing directions for South American waters that resulted from the *Beagle*'s surveys, kept him busy for several years. In 1841, thanks once more to the influence of Lord Londonderry, he became Tory M.P. for the County of Durham. Soon afterwards he was appointed an Elder of Trinity House and Acting Conservator of the River Mersey. Then in 1843 he was offered the governorship of New Zealand, and resigning from the House of Commons and from his other posts, arrived at Auckland with his wife and family in December of that year. He found himself faced with a hopeless economic situation, and an impossible conflict between the claims of the white settlers and the native Maoris. Although he acted throughout with the best of intentions, and generally with little real choice over the line to be taken, his inflexibility and lack of political flair, coupled with the tendency to take precipitate action without first consulting his superiors at home that he had previously displayed in his dealings with the Admiralty, led to his recall after only two years. During the next five years, he interested himself in the application of steam to the propulsion of ships, and having in 1848 been appointed acting superintendent of Woolwich Dockyard, conducted the trials of the Navy's first screw-driven steamship, named all too aptly H.M.S. *Arrogant*.

In 1850 he resigned from active service in the Navy, though in view of the importance of his later work to the safety of navigation of the high seas, he was subsequently promoted rear-admiral (1857) and finally vice-admiral (1865). His distinction as a hydrographer and scientific navigator was recognized the following year by his election as a Fellow of the Royal Society, his supporters including Darwin and Beaufort. In 1853 he had a brief spell as private secretary to another of his relatives, Lord Hardinge, who was commander-in-chief of the Army. Then came the job that occupied him for the rest of his life, in which he can be said to have found his true vocation. On the advice of the Royal Society, the Board of Trade put him in charge of a new organization which from modest beginnings ultimately became the Meteorological Office. He had the title of Meteorological Statist, and a staff of three. He threw himself with characteristic intensity into the immense task of collecting the information on which the forecasting of weather conditions off the coasts of Great Britain would depend. One step that he instituted was to see that coastal towns and villages were equipped to make basic meteorological observations, which was achieved by the issue of what came to be known as the FitzRoy Barometer, and an official *Barometer Manual*. Another was the introduction of a system of warning cones that were hoisted at ports and harbours when a gale was expected. In 1862 he published his *Weather Book*, a popular account of world weather phenomena, and a guide to the practical problems of weather recording and forecasting. Throughout the book he emphasized that the prime purpose of making barometric observations was not just to describe the present state of the air, but was to foretell the weather to come. However, his undoubtedly correct insistence



on the importance of prediction contained the seeds of disaster for him. At a time when telegraphic communication was in its infancy, and the network of reporting stations much less widely spread than is considered essential today, mistakes in the forecasts were inevitable. Criticism grew, both from private and public quarters, and FitzRoy took it all to heart. On 30 April 1865, in a deeper fit of depression than usual, he cut his throat. He deserves to be remembered not just as Darwin's captain on the *Beagle*, although the importance of the help and encouragement that he gave during the voyage, and his role in stimulating the development of Darwin's ideas, are not to be lightly dismissed. He was also a hydrographer in the front rank, parts of whose charts of South American waters and sailing directions for them are still in use nearly 150 years after the survey was conducted. Above all, he was one of the principal founders of the science of meteorology.

Finally, what of our philosopher? Charles Darwin was born at Shrewsbury on 9 February 1809, the second son and fifth of the six children of Dr Robert Darwin and Susannah Wedgwood. His rather formidable father was a highly regarded and prosperous physician. From 1818 to 1825 he attended Shrewsbury School, but was not an outstanding pupil, earning a public rebuke from the headmaster for wasting his time on chemical experiments with his brother Erasmus in a tool shed at home, and being castigated by his father with the words, 'You care for nothing but shooting, dogs, and rat-catching, and you will be a disgrace to yourself and all your family.' He proceeded to Edinburgh University as a medical student, but after two years it became clear that although he had some aptitude for anatomy and zoology – and, because of the dullness of the teaching, a positive aversion to geology – he did not look forward to the prospect of actually practising medicine. His father therefore proposed that he should instead take holy orders in the Church of England, and in 1827 he duly matriculated at Christ's College, Cambridge, with this intention. His theological studies did not, however, flourish noticeably better than had his medical ones, for he devoted most of his energy to sporting activities and to natural history, and although he achieved a pass in his final examination, his position on the list of candidates was not distinguished. Nevertheless, he had not entirely wasted his time, for his beetle collecting brought him into contact with John Stevens Henslow, professor of botany, who kept open house where undergraduates could meet senior members of the university. Henslow himself gave Darwin an indoctrination in botany and other branches of natural history, and the frequency of their excursions together led to his becoming known in university circles as 'the man who walks with Henslow'. Through Henslow, Darwin met Adam Sedgwick, professor of geology, and in the summer of 1831 accompanied him on a geological trip to North Wales that not only dispelled for ever his previous distaste for the subject, but also taught him a valuable lesson in scientific reasoning.

When Darwin embarked on the *Beagle* he had, on the face of it, had little formal training either as a naturalist or as a geologist. But his sponsors in Cambridge had faith in the latent talent that they perceived in him, and it was abundantly justified. It is clear, moreover, that by judicious reading and the attention he had paid to the practical instruction given him by Henslow and Sedgwick, he was much better



prepared for his task than the charmingly self-derogatory remarks in his letters would lead one to suppose. Judging from his diary and notebooks, the manner in which from the very start he set to work can only be described as highly professional. He was a superb observer, and his ingenious speculations on the relation between cause and effect for every phenomenon that he examined are a joy to read. Already in 1832 he had found at Bahia Blanca the fossil glyptodont whose resemblance to the living armadillos seemed to need an explanation; the following year he was puzzling over the relationship between changes in habitat and the geographical range of closely similar species; in the Falkland Islands in March 1834 he began to think about the populations of isolated islands; and in September 1835 came the crowning experience of the Galapagos Islands. With the application of such an acute and highly analytical approach to the wide range of new facts that, grasping his matchless opportunity with a sure hand, he was privileged to discover, the ultimate emergence of *The Origin of Species* was inevitable.

The achievements of the *Beagle* did not just depend on FitzRoy's skill as a hydrographer, nor on Darwin's skill as a natural scientist, but on the thoroughly effective fashion in which everyone on board pulled together. Of course Darwin and FitzRoy had their quarrels, but all things considered, they were remarkably infrequent. To have shared such cramped quarters for nearly five years with a man often suffering from serious depression, prostrate part of the time with sea sickness, with so little friction, Darwin must have been one of the best-natured people ever! This is, indeed, apparent in his letters. And anyone who has participated in a scientific expedition will agree that when he wrote from Valparaiso in July 1834 that 'The Captain keeps all smooth by rowing everyone in turn, which of course he has as much right to do as a gamekeeper to shoot partridges on the first of September', he was putting a finger on an important ingredient in the *Beagle's* success.

On 24 January 1839, Darwin was elected a Fellow of the Royal Society, and five days later he was married to his cousin Emma Wedgwood. The first three and a half years of their married life were spent in London at a house in Gower Street, but in the autumn of 1842 they were compelled by his persistent ill health to move to the quiet of the country at Down House, in the village of Downe in Kent. Here he worked until his death from a heart attack on 19 April 1882. From 1838 to 1841 he was Secretary of the Geological Society of London, but apart from service on its Council and that of the Royal Society, he withdrew completely from public life.

The contrast between the semi-invalid of Down House and the Darwin of *Beagle* days, who made light of the hardships of life at sea, who roughed it with gauchos and made journeys of many hundreds of miles on horseback, and who cheerfully tackled mountains that would have daunted a practised mountaineer, is a striking one. Yet his doctors were never able to find any organic cause for his ailments. A theory<sup>1</sup> that has found some support is that he was infected in Argentina or Chile with *Trypanosoma cruzi*, the agent identified in 1909 as the cause

<sup>1</sup> See Adler (1959).



of Chagas's Disease, which was endemic in many parts of South America, and remains a major health problem today. Undoubtedly he may have been exposed to this disease, because the vector is *Triatoma infestans*, the Benchuca bug, by which he was bitten on 25 March 1835 and perhaps on other occasions that he did not trouble to record; and a case can be made for matching its rather widely ranging symptoms with his. However, only a very small proportion of the victims survive to their seventies as he did, and it is inconsistent with this diagnosis that his health actually showed some improvement during the last ten years of his life. For these and other reasons,<sup>1</sup> the hypothesis that Darwin contracted Chagas's disease has to be rejected. Another speculation<sup>2</sup> is that he was exposed to chronic arsenic poisoning; but again the evidence is strictly circumstantial, and any direct proof is lacking. The alternative view is that Darwin's illness arose from a deep seated psychoneurosis. To a twentieth century descendant plagued with committee work, the suggestion<sup>3</sup> that the cause was 'the conflict between his passionate desire to collect convincing evidence for his hypothesis and the threat imposed on his work by social intercourse' is an appealing one. For although his normal working day was sadly reduced in length by the habitual dyspepsia and other bodily disorders from which he suffered so severely, *The Origin of Species*, and a host of other books without which science would have been much the poorer, did emerge from the seclusion of Down House. However, it has been authoritatively argued<sup>4</sup> that an even greater source of mental stress was 'his determination to win acceptance for his evolutionary theory, and his anxieties over the difficulties of proving this theory and over some of its ideological consequences'. Both theories seem to run into some difficulty in that the periods when his illness was most acute did not always coincide with those when he would have been under the greatest psychological pressure. But they are not mutually exclusive, and the truth may be that stresses of many kinds combined to produce their destructive effects on Darwin's health.

<sup>1</sup>Woodruff (1965). <sup>2</sup>Winslow (1971). <sup>3</sup>Pickering (1974). <sup>4</sup>Colp (1977).







*Complement of the 'Beagle', 1831-1836*

Robert FitzRoy	Commander and Surveyor
John Clements Wickham	Lieutenant
Bartholomew James Sullivan	Lieutenant
Edward Main Chaffers	Master
Robert MacCormick	Surgeon (to April 1832)
Benjamin Bynoe	Assistant Surgeon until 1832, Surgeon for rest of voyage
William Kent	Assistant Surgeon (from September 1833)
George Rowlett	Purser (until June 1834)
John Edward Dring	Acting Purser (from 1834)
Alexander Derbishire	Mate (to April 1832)
Robert Hamond	Mate (August 1832 to May 1833)
Peter Benson Stewart	Mate
John Lort Stokes	Mate and Assistant Surveyor
Arthur Mellersh	Midshipman, received Mate's warrant in 1832
Philip Gidley King	Midshipman (to February 1836)
Charles Forsyth	Midshipman (from 1832)
Alexander Burns Usborne	Master's Assistant
Charles Richardson Johnson	Midshipman, later Mate
Charles Musters	Volunteer 1st Class (to May 1832)
Jonathan May	Carpenter
Edward Hellyer	Clerk (to March 1833)
Thomas Sorrell	Acting Boatswain
Charles Darwin	Naturalist
Augustus Earle	Draughtsman (to August 1832)
Conrad Martens	Draughtsman (1833 to 1834)
George James Stebbing	Instrument Maker
Syms Covington	Mr Darwin's servant
Richard Matthews	Missionary (to 1833)
About 50 marines, seamen and boys	



# *The Beagle Record*

At the end of August 1831, Charles Darwin received a letter from the Rev. George Peacock of Trinity College, Cambridge, Lowndean Professor of Astronomy in the University, inviting him to go as naturalist on the voyage about to be undertaken by H.M.S. *Beagle*, under the command of Captain Robert FitzRoy, R.N.

GEORGE PEACOCK TO C.D.

[NO DATE OR ADDRESS]

My dear Sir,

I received Henslow's letter last night too late to forward it to you by the post, a circumstance which I do not regret, as it has given me an opportunity of seeing Captain Beaufort at the Admiralty (the Hydrographer) & of stating to him the offer which I have to make to you: he entirely approves of it & you may consider the situation as at your absolute disposal: I trust that you will accept it as it is an opportunity which should not be lost & I look forward with great interest to the benefit which our collections of natural history may receive from your labours.

The circumstances are these. Captain FitzRoy (a nephew of the Duke of Grafton's) sails at the end of September in a ship to survey in the first instance the S. Coast of Terra del Fuego, afterwards to visit the S. Seas Islands & to return by the Indian Archipelago to England: the expedition is entirely for scientific purposes & the ship will generally wait your leisure for researches in natural history etc: Captain Fitzroy is a public spirited & zealous officer, of delightful manners & greatly beloved by all his brother officers: he went with Captain Beechey & spent 1500 L in bringing over & educating at his own charge 3 natives of Patagonia: he engages at his own expense an artist at 200 a year to go with him: you may be sure therefore of having a very pleasant companion, who will enter heartily into all your views.

The ship sails about the end of September & you must lose no time in making known your acceptance to Captain Beaufort & Admiralty Lords.

I have had a good deal of correspondence about this matter [*with Henslow*] who feels in common with myself the greatest anxiety that you should go: I hope that no other arrangements are likely to interfere with it.

Captain will give you the rendezvous & all requisite information: I should recommend you to come up to London in order to see him & to complete your arrangements.

I shall leave London on Monday: perhaps you will have the goodness to write





*Charles Darwin as a young man, 1840*

to me at Denton, Darlington, to say that you will go.

The Admiralty are not disposed to give a salary, though they will furnish you with an official appointment & every accommodation: if a salary should be required however I am inclined to think that it would be granted.

Believe me, My dear Sir, very truly yours

Geo Peacock

If you are with Sedgwick I hope you will give my kind regards to him.

*Darwin and Henslow pp.31-32*



What followed is best described in this passage from Darwin's Autobiography:

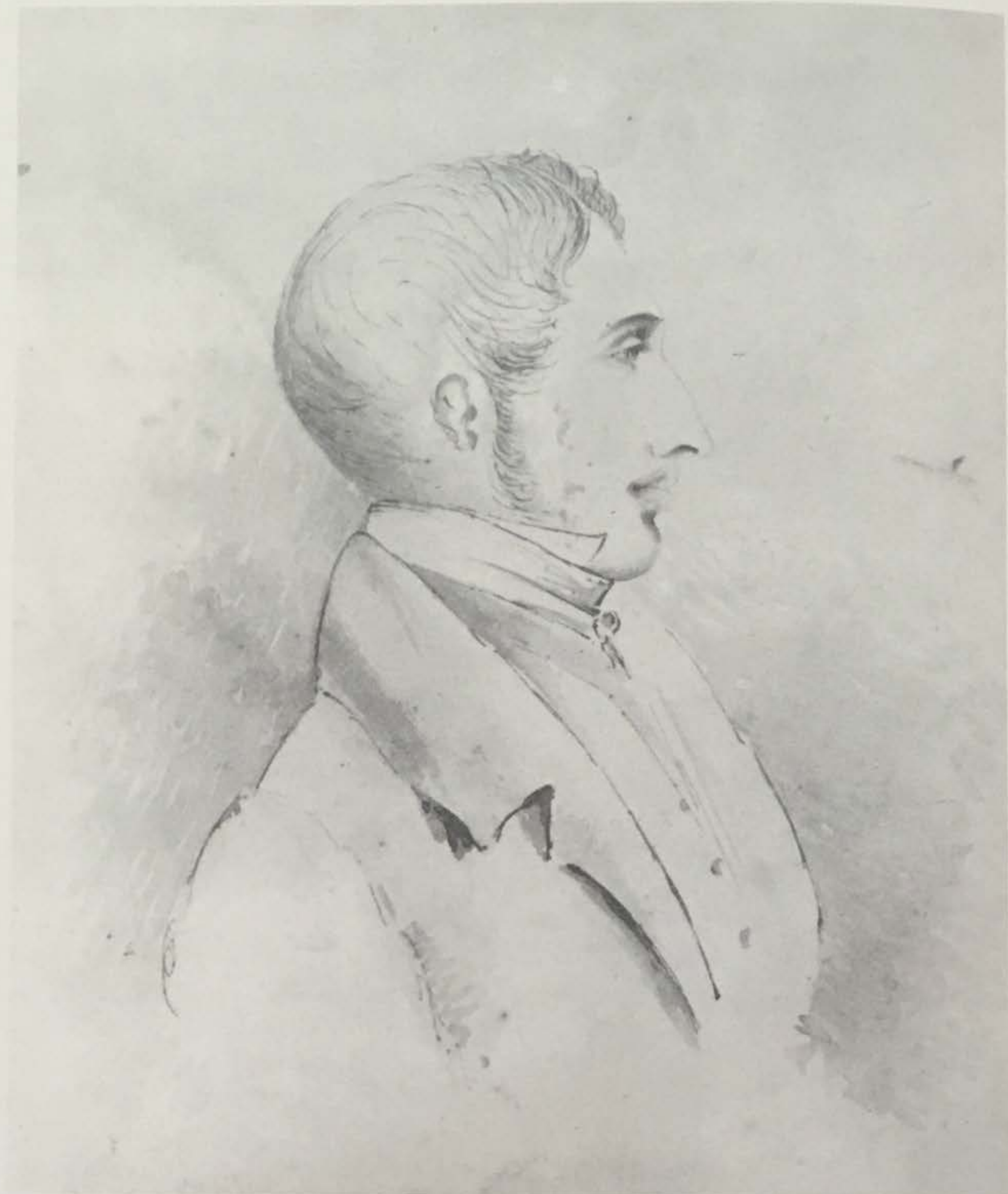
On returning home from my short geological tour in N. Wales, I found a letter from Henslow, informing me that Captain Fitz-Roy was willing to give up part of his own cabin to any young man who would volunteer to go with him without pay as naturalist to the Voyage of the *Beagle*. I have given as I believe in my M.S. Journal an account of all the circumstances which then occurred; I will here only say that I was instantly eager to accept the offer, but my father strongly objected, adding the words fortunate for me, 'If you can find any man of common sense, who advises you to go, I will give my consent.' So I wrote that evening and refused the offer. On the next morning I went to Maer to be ready for September 1st, and whilst out shooting, my uncle sent for me, offering to drive me over to Shrewsbury and talk with my father. As my uncle thought it would be wise in me to accept the offer, and as my father always maintained that he was one of the most sensible men in the world, he at once consented in the kindest manner. I had been rather extravagant at Cambridge and to console my father said, 'that I should be deuced clever to spend more than my allowance whilst on board the *Beagle*'; but he answered with a smile, 'But they all tell me you are very clever.'

Next day I started for Cambridge to see Henslow, and thence to London to see Fitz-Roy, and all was soon arranged. Afterwards on becoming very intimate with Fitz-Roy, I heard that I had run a very narrow risk of being rejected, on account of the shape of my nose! He was an ardent disciple of Lavater, and was convinced that he could judge a man's character by the outline of his features; and he doubted whether anyone with my nose could possess sufficient energy and determination for the voyage. But I think he was afterwards well-satisfied that my nose had spoken falsely.

Fitz-Roy's character was a singular one, with many very noble features: he was devoted to his duty, generous to a fault, bold, determined, indomitably energetic, and an ardent friend to all under his sway. He would undertake any sort of trouble to assist those whom he thought deserved assistance. He was a handsome man, strikingly like a gentleman, with highly courteous manners, which resembled those of his maternal uncle, the famous Lord Castlereagh, as I was told by the Minister at Rio. Nevertheless he must have inherited much in his appearance from Charles II, for Dr Wallich gave me a collection of photographs which he had made, and I was struck with the resemblance of one to Fitz-Roy; on looking at the name, I found it Ch. E. Sobieski Stuart, Count d'Albanie, illegitimate descendant of the same monarch.

Fitz-Roy's temper was a most unfortunate one. This was shown not only by passion but by fits of long-continued moroseness against those who had offended him. His temper was usually worst in the early morning, and with his eagle eye he could generally detect something amiss about the ship, and was then unsparing in his blame. The junior officers when they relieved each other in the forenoon used to ask 'whether much hot coffee had been served out this morning,' which meant how was the Captain's temper? He was also somewhat suspicious and occasionally in very low spirits, on one occasion bordering on insanity. He seemed to me





*Robert FitzRoy, 1838*

often to fail in sound judgment or common sense. He was extremely kind to me, but was a man very difficult to live with on the intimate terms which necessarily followed from our messing by ourselves in the same cabin. We had several quarrels; for when out of temper he was utterly unreasonable. For instance, early in the voyage at Bahia in Brazil he defended and praised slavery, which I abominated, and told me that he had just visited a great slave-owner, who had called up many of his slaves and asked them whether they were happy, and whether they wished to be free, and all answered 'No.' I then asked him, perhaps with a sneer, whether he thought that the answers of slaves in the presence of their



master was worth anything. This made him excessively angry, and he said that as I doubted his word, we could not live any longer together. I thought that I should have been compelled to leave the ship; but as soon as the news spread, which it did quickly, as the captain sent for the first lieutenant to assuage his anger by abusing me, I was deeply gratified by receiving an invitation from all the gun-room officers to mess with them. But after a few hours Fitz-Roy showed his usual magnanimity by sending an officer to me with an apology and a request that I would continue to live with him. I remember another instance of his candour. At Plymouth before we sailed, he was extremely angry with a dealer in crockery who refused to exchange some article purchased in his shop: the Captain asked the man the price of a very expensive set of china and said 'I should have purchased this if you had not been so disobliging.' As I knew that the cabin was amply stocked with crockery, I doubted whether he had any such intention; and I must have shown my doubts in my face, for I said not a word. After leaving the shop he looked at me, saying You do not believe what I have said, and I was forced to own that it was so. He was silent for a few minutes and then said You are right, and I acted wrongly in my anger at the blackguard.

At Conception in Chile, poor Fitz-Roy was sadly overworked and in very low spirits; he complained bitterly to me that he must give a great party to all the inhabitants of the place. I remonstrated and said that I could see no such necessity on his part under the circumstances. He then burst out into a fury, declaring that I was the sort of man who would receive any favours and make no return. I got up and left the cabin without saying a word, and returned to Conception where I was then lodging. After a few days I came back to the ship and was received by the Captain as cordially as ever, for the storm had by that time quite blown over. The first Lieutenant, however, said to me: 'Confound you, philosopher, I wish you would not quarrel with the skipper; the day you left the ship I was dead-tired (the ship was refitting) and he kept me walking the deck till midnight abusing you all the time.' The difficulty of living on good terms with a Captain of a Man-of-War is much increased by its being almost mutinous to answer him as one would answer anyone else; and by the awe in which he is held – or was held in my time, by all on board. I remember hearing a curious instance of this in the case of the purser of the *Adventure*, the ship which sailed with the *Beagle* during the first voyage. The Purser was in a store in Rio de Janeiro, purchasing rum for the ship's company, and a little gentleman in plain clothes walked in. The Purser said to him, 'Now Sir, be so kind as to taste this rum, and give me your opinion of it.' The gentleman did as he was asked, and soon left the store. The store-keeper then asked the Purser, whether he knew that he had been speaking to the Captain of a Line of Battleships which had just come into the harbour. The poor Purser was struck dumb with horror; he let the glass of spirit drop from his hand onto the floor, and immediately went on board, and no persuasion, as an officer on the *Adventure* assured me, could make him go on shore again for fear of meeting the Captain after his dreadful act of familiarity.

I saw Fitz-Roy only occasionally after our return home, for I was always afraid of unintentionally offending him, and did so once, almost beyond mutual



reconciliation. He was afterwards very indignant with me for having published so unorthodox a book (for he became very religious) as the *Origin of Species*. Towards the close of his life he was as I fear, much impoverished, and this was largely due to his generosity. Anyhow after his death a subscription was raised to pay his debts. His end was a melancholy one, namely suicide, exactly like that of his uncle Ld Castlereagh, whom he resembled closely in manner and appearance.

His character was in several respects one of the most noble which I have ever known, though tarnished by grave blemishes.

The voyage of the *Beagle* has been by far the most important event in my life and has determined my whole career; yet it depended on so small a circumstance as my uncle offering to drive me 30 miles to Shrewsbury, which few uncles would have done, and on such a trifle as the shape of my nose. I have always felt that I owe to the voyage the first real training or education of my mind. I was led to attend closely to several branches of natural history, and thus my powers of observation were improved, though they were already fairly developed.

The investigation of the geology of all the places visited was far more important, as reasoning here comes into play. On first examining a new district nothing can appear more hopeless than the chaos of rocks; but by recording the stratification and nature of the rocks and fossils at many points, always reasoning and predicting what will be found elsewhere, light soon begins to dawn on the district, and the structure of the whole becomes more or less intelligible. I had brought with me the first volume of Lyell's *Principles of Geology*, which I studied attentively; and this book was of the highest service to me in many ways. The very first place which I examined, namely St Jago in the Cape Verde islands, showed me clearly the wonderful superiority of Lyell's manner of treating geology, compared with that of any other author, whose works I had with me or ever afterwards read.

Another of my occupations was collecting animals of all classes, briefly describing and roughly dissecting many of the marine ones; but from not being able to draw and from not having sufficient anatomical knowledge a great pile of MS. which I made during the voyage has proved almost useless. I thus lost much time, with the exception of that spent in acquiring some knowledge of the Crustaceans, as this was of service when in after years I undertook a monograph of the Cirripedia.

During some part of the day I wrote my Journal, and took much pains in describing carefully and vividly all that I had seen; and this was good practice. My Journal served, also, in part as letters to my home, and portions were sent to England, whenever there was an opportunity.

The above various special studies were, however, of no importance compared with the habit of energetic industry and of concentrated attention to whatever I was engaged in, which I then acquired. Everything about which I thought or read was made to bear directly on what I had seen and was likely to see; and this habit of mind was continued during the five years of the voyage. I feel sure that it was this training which has enabled me to do whatever I have done in science.

Looking backwards, I can now perceive how my love for science gradually



preponderated over every other taste. During the first two years my old passion for shooting survived in nearly full force, and I shot myself all the birds and animals for my collection; but gradually I gave up my gun more and more, and finally altogether to my servant, as shooting interfered with my work, more especially with making out the geological structure of a country. I discovered, though unconsciously and insensibly, that the pleasure of observing and reasoning was a much higher one than that of skill and sport. The primeval instincts of the barbarian slowly yielded to the acquired tastes of the civilized man. That my mind became developed through my pursuits during the voyage, is rendered probable by a remark made by my father, who was the most acute observer whom I ever saw, of a sceptical disposition, and far from being a believer in phrenology; for on first seeing me after the voyage, he turned round to my sisters and exclaimed, 'Why, the shape of his head is quite altered.'

To return to the voyage. On September 11th (1831) I paid a flying visit with Fitz-Roy to the *Beagle* at Plymouth. Thence to Shrewsbury to wish my father and sisters a long farewell. On Oct. 24th, I took up my residence at Plymouth, and remained there until December 27th when the *Beagle* finally left the shores of England for her circumnavigation of the world. We made two earlier attempts to sail, but were driven back each time by heavy gales. These two months at Plymouth were the most miserable which I ever spent, though I exerted myself in various ways. I was out of spirits at the thought of leaving all my family and friends for so long a time, and the weather seemed to me inexpressibly gloomy. I was also troubled with palpitations and pain about the heart, and like many a young ignorant man, especially one with a smattering of medical knowledge, was convinced that I had heart-disease. I did not consult any doctor, as I fully expected to hear the verdict that I was not fit for the voyage, and I was resolved to go at all hazards.

I need not here refer to the events of the voyage – where we went and what we did – as I have given a sufficiently full account in my published Journal. The glories of the vegetation of the Tropics rise before my mind at the present time more vividly than anything else. Though the sense of sublimity, which the great deserts of Patagonia and the forest-clad mountains of Tierra del Fuego excited in me, has left an indelible impression on my mind. The sight of a naked savage in his native land is an event which can never be forgotten. Many of my excursions on horseback through wild countries, or in the boats, some of which lasted several weeks, were deeply interesting; their discomfort and some degree of danger were at that time hardly a drawback and none at all afterwards. I also reflect with high satisfaction on some of my scientific work, such as solving the problem of coral-islands, and making out the geological structure of certain islands, for instance, St Helena. Nor must I pass over the discovery of the singular relations of the animals and plants inhabiting the several islands of the Galapagos archipelago, and of all of them to the inhabitants of South America.

As far as I can judge of myself I worked to the utmost during the voyage from the mere pleasure of investigation, and from my strong desire to add a few facts to the great mass of facts in natural science. But I was also ambitious to take a fair



place among scientific men – whether more ambitious or less so than most of my fellow-workers I can form no opinion.

The geology of St Jago is very striking yet simple: a stream of lava formerly flowed over the bed of the sea, formed of triturated recent shells and corals, which it has baked into a hard white rock. Since then the whole island has been upheaved. But the line of white rock revealed to me a new and important fact, namely that there had been afterwards subsidence round the craters, which had since been in action, and had poured forth lava. It then first dawned on me that I might perhaps write a book on the geology of the various countries visited, and this made me thrill with delight. That was a memorable hour to me, and how distinctly I can call to mind the low cliff of lava beneath which I rested, with the sun glaring hot, a few strange desert plants growing near, and with living corals in the tidal pools at my feet. Later in the voyage Fitz-Roy asked to read some of my Journal, and declared it would be worth publishing; so here was a second book in prospect!

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 Soc. 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. After reading this letter I clambered over the mountains of Ascension with a bounding step and made the volcanic rocks resound under my geological hammer! All this shows how ambitious I was; but I think that I can say with truth that in after years, though I cared in the highest degree for the approbation of such men as Lyell and Hooker, who were my friends, I did not care much about the general public. I do not mean to say that a favourable review or a large sale of my books did not please me greatly; but the pleasure was a fleeting one, and I am sure that I have never turned one inch out of my course to gain fame.

*Autobiography* pp. 71–82

During November and December, the *Beagle* remained at anchor in the dockyard, making abortive attempts to sail on December 10th and again on December 21st. Darwin began to become acquainted with her officers.

DEC. 13th. An idle day; dined for the first time in Captain's cabin & felt quite at home. Of all the luxuries the Captain has given me, none will be so essential as that of having my meals with him. I am often afraid I shall be quite overwhelmed with the number of subjects which I ought to take into hand. It is difficult to mark out any plan & without method on shipboard I am sure little will be done. The principal objects are 1st, collecting, observing & reading in all branches of Natural history that I possibly can manage. Observations in Meteorology, French & Spanish, Mathematics, & a little Classics, perhaps not more than Greek







## GENERAL CHART shewing the PRINCIPAL

*The voyage of the 'Beagle'*

intelligent men who have seen so much & whose characters are so early & decidedly brought out, should be so entirely devoid of interest.

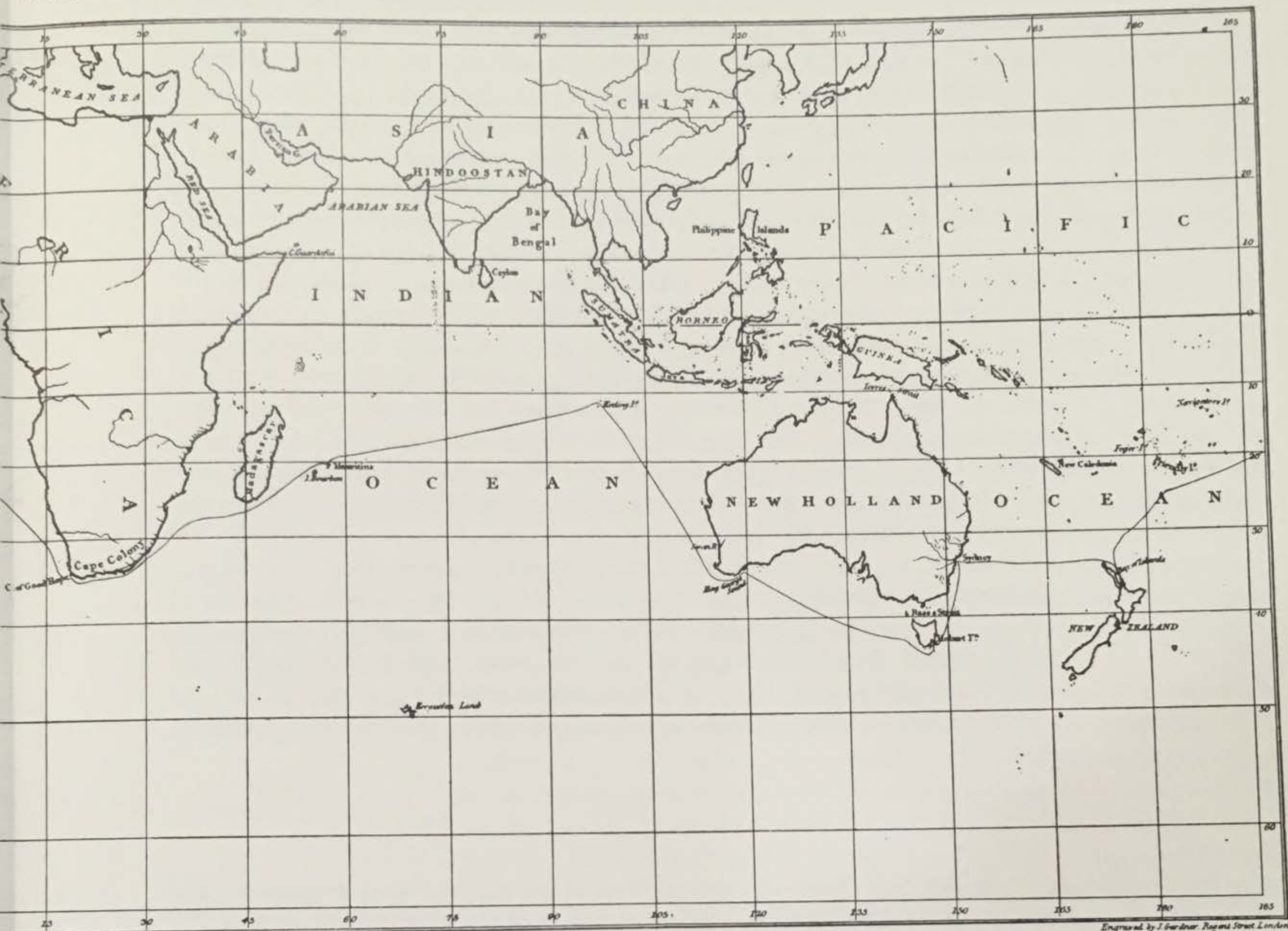
*Diary p. 17*

The *Beagle* sailed from Plymouth on December 27th 1831. Her first landfall was made at Madeira on January 4th, but bad weather dissuaded FitzRoy from anchoring in the Funchal Roads. She proceeded to the Canary Islands, where because of reports of cholera in England, permission to land was refused.

JAN. 6 th. After heaving to during the night we came in sight of Teneriffe at day



## TRACKS of H.M.S. BEAGLE - 1831-6



break, bearing S.W. about 12 miles off. We are now a few miles, tacking with a light wind to Santa Cruz, which at this distance looks a small town, built of white houses & lying very flat. Point Naga, which we are doubling, is a rugged uninhabited mass of lofty rock with a most remarkably bold & varied outline. In drawing it you could not make a line straight. Every thing has a beautiful appearance: the colours are so rich & soft. The peak or sugar loaf has just shown itself above the clouds. It towers in the sky twice as high as I should have dreamed of looking for it. A dense bank of clouds entirely separates the snowy top from its rugged base. It is now about 11 o'clock & I must have another gaze at this long wished for object of my ambition. Oh misery, misery, we were just preparing to



drop our anchor within half a mile of Santa Cruz, when a boat came alongside, bringing with it our death-warrant. The consul declared we must perform a rigorous quarantine of twelve days. Those who have never experienced it can scarcely conceive what a gloom it cast on every one: matters were soon decided by the Captain ordering all sail to be set & make a course for the Cape Verd Islands. And we have left perhaps one of the most interesting places in the world, just at the moment when we were near enough for every object to create without satisfying our utmost curiosity. The abrupt vallies which divided in parallel rows the brown & desolate hills were spotted with patches of a light green vegetation & gave the scenery to me a very novel appearance. I suppose, however, that Volcanic islands under the same zone have much the same character. On deck to day the view was compared as very like to other places, especially to Trinidad in West Indies. Santa Cruz is generally accused of being ugly & uninteresting, it struck me as much the contrary. The gaudy coloured houses of white, yellow & red; the oriental-looking Churches & the low dark batteries, with the bright Spanish flag waving over them were all most picturesque. The small trading vessels with their raking masts & the magnificent back ground of Volcanic rock would together have made a most beautiful picture. But it is past & tomorrow morning we shall probably only see the grey outline of the surrounding hills. We are however as yet only a few miles from the town, it is now about 10 o'clock & we have been becalmed for several hours. The night does its best to sooth our sorrow; the air is still & deliciously warm; the only sounds are the waves rippling on the stern & the sails idly flapping round the masts. Already, can I understand Humboldt's enthusiasm about the tropical nights; the sky is so clear & lofty, & stars innumerable shine so bright, that like little moons, they cast their glitter on the waves.

*Diary* pp. 20-1

[JAN. 7th] Observations on shore being indispensable for our purpose, and finding, after some discussion, that there was no chance of attaining our object in a manner that would at all compensate for the delay caused by anchoring and performing quarantine, we weighed without further loss of time, and made sail for the Cape Verd Islands.

This was a great disappointment to Mr Darwin, who had cherished a hope of visiting the Peak. To see it – to anchor and be on the point of landing, yet be obliged to turn away without the slightest prospect of beholding Teneriffe again – was indeed to him a real calamity.

During the whole of the 7th, the Peak was visible; but on the following day no land was in sight, and we made rapid progress. A very long swell from the north-west, which we felt until the 10th, was probably caused by a gale in the northern Atlantic; and, judging from its size and velocity, I should think that it could not have subsided before traversing many, perhaps ten more, degrees of latitude; which would be to about 10° north. It is interesting to notice how far the undulatory movement of water reaches: in this case it extended through at least



ten degrees of latitude where the wind was from different quarters, and probably much farther.

An unusual appearance was observed on the 12th. A cloud like a dense fog-bank approached; and as it drew near, the lower and darker part became arched, and rose rapidly, while under it was a white glare, which looked very suspicious. Sail was immediately reduced – we expected a violent squall; but the cloud dispersed suddenly, and only a common fresh breeze came from the foreboding quarter. Neither the sympiesometer nor the barometer had altered at all; but the cloud was so threatening that I put no trust in their indications, not being then so firm a believer in their prophetic movements as I am at present. Nevertheless, I would by no means advocate the neglect of any precaution suggested by appearance of the weather, although no change should be foretold by the glasses. A mistake may be made by the observer, or a variation in the height of the column may have passed unheeded; while it is seldom that a practised eye can be deceived by the visible signs of an approaching squall or gale of wind.

Undoubtedly the worst wind, next to a hurricane, which a vessel can encounter, is a violent 'white squall', so called because it is accompanied by no cloud or peculiar appearance in the sky, and because of its tearing up the surface of the sea, and sweeping it along so as to make a wide sheet of foam. By squalls of this description, frequent in the West-Indies, and occasionally felt in other parts of the world, no notice will be given much above the horizon; but by consulting a good barometer or sympiesometer, and frequently watching the surface of the sea itself, even a white squall may be guarded against in sufficient time.

Squalls accompanied by clouds are so common, and at sea every one is so much accustomed to look out for them, that I may cause a smile by these notices; yet as there is often much doubt in a young officer's mind, whether an approaching cloud will be accompanied by wind or rain, or by both, and many persons are unable to distinguish, by the mere appearance of a cloud, what is likely to come with or from it, I will venture to mention that when they look hard, or hard-edged (like Indian ink rubbed upon an oily plate), they indicate wind, and perhaps rain; but before the rain falls, those clouds will assume a softer appearance. When they are undefined, and look soft, rain will follow, but probably not much wind.

Dark clouds, hard mixed with soft, and inky fragments in rapid motion beneath them, accompanied perhaps by lightning and distant thunder, are the forerunners of a heavy squall. Soft, shapeless clouds, in which it is impossible to point out a definite edge, usually bring rain, but not wind: and, generally speaking, the more distinctly defined the edges of clouds are, the more wind they foretell. A little attention to these simple observations, so familiar to persons who have been some time at sea, may save young officers unnecessary anxiety in one case, and prompt them to shorten sail at a proper time in the other.

In again trying for soundings with three hundred fathoms of line, near the Island of St Jago, we became fully convinced of the utility of a reel, which Captain Beaufort had advised me to procure, and of which Captain Vidal had spoken to him in very favourable terms. Two men were able to take in the deep sea line, by this machine, without interfering with any part of the deck, except the place near



the stern, where the reel was firmly secured. Throughout our voyage this simple contrivance answered its object extremely well, and saved the crew a great deal of harassing work.

*Narrative* 2 pp.49-51

JAN. 10th. We crossed the Tropic this morning; if our route did not extend further, Neptune would here celebrate the awful ceremonies of the Equator. The weather is beautiful, & very little hotter than the middle of our summer: we have all put on our light clothes; what a contrast one fortnight has brought about as compared to the miserable wet weather of Plymouth. There was a glorious sunset this evening & is now followed by an equally fine moonlight night. I do not think I ever before saw the sun set in a clear horizon. I certainly never remarked the marvellous rapidity with which the disk after having touched the ocean dips behind it. I proved to day the utility of a contrivance which will afford me many hours of amusement & work, it is a bag four feet deep, made of bunting, & attached to [a] semicircular bow: this by lines is kept upright, & dragged behind the vessel. This evening it brought up a mass of small animals & tomorrow I look forward to a greater harvest.

11th. I am quite tired having worked all day at the produce of my net. The number of animals that the net collects is very great & fully explains the manner so many animals of a large size live so far from land. Many of these creatures, so low in the scale of nature, are most exquisite in their forms & rich colours. It creates a feeling of wonder that so much beauty should be apparently created for such little purpose. The weather is beautiful & the blueness of the sky when contrasted with white clouds is certainly striking. Again did I admire the rapid course of the setting sun. It did not at first occur to me that it was owing to the change of Latitude: I forgot that the same vertical motion of the sun which causes the short twilight at the Equator, must necessarily hasten its disappearance beneath the horizon. The mean Temp. from 12 observations for the 10th was  $73\frac{1}{2}$ .

12th, 13th. These have been two quiet uninteresting days: my time since the making of the net has been fully occupied with collecting & observing the numerous small animals in the sea. I find sea-life so far from unpleasant, that I am become quite indifferent whether we arrive a week sooner or later at any port. I cannot help much regretting we were unable to stay at Teneriffe. St Jago is so miserable a place that my first landing in a Tropical country will not make that lasting impression of beauty which so many have described.

14th & 15th. These, like the last two days, have rapidly glided past with nothing to mark their transit. The weather has been light & to sailors very annoying: all the 15th we were tacking about the N.W. end of St Jago, making so little way, from the effects of a strong current, that after some hours we scarcely got on a mile. Some few birds have been hovering about the vessel & a large gay coloured cricket found an insecure resting place within the reach of my fly-nippers. He must at the least have flown 370 miles from the coast of Africa.

*Diary* pp.22-3



Darwin went ashore for the first time at St Jago, in the Cape Verde Islands.

MONDAY, JAN. 16th. At about 11 o'clock we neared the Western coast of St Jago & by about three we anchored in the bay of Porto Praya. St Jago viewed from the sea is even much more desolate than the land about Santa Cruz. The Volcanic fire of past ages, & the scorching heat of a tropical sun, have in most places rendered the soil sterile & unfit for vegetation. The country rises in successive steps of table land, interspersed by some truncate conical hills, & the horizon is bounded by an irregular chain of more lofty & bolder hills. The scene, when viewed through the peculiar atmosphere of the tropics was one of great interest: if, indeed, a person fresh from sea, & walking for the first time in a grove of cocoa-nut trees, can be a judge of anything but his own happiness. At three o'clock I went with a party to announce our arrival to the 'Governador'. After having found out the house, which certainly is not suited to the grandeur of his title, we were ushered into a room, where the great man most courteously received us. After having made out our story in a very ludicrous mixture of Portuguese, English & French, we retreated under a shower of bows. We then called on the American Consul who likewise acts for the English. The Portugeese might with great advantage have instilled a little of his well-bred politesse into this quarter. I was surprised at the houses: the rooms are large & airy, but with uncommonly little furniture, & that little in vile taste. We then strolled about the town, & feasted upon oranges: which I believe are now selling a hundred per shilling. I likewise tasted a Banana: but did not like it, being maukish & sweet with little flavour. The town is a miserable place, consisting of a square & some broad streets, if indeed they deserve so respectable a name. In the middle of these 'Ruas' are lying together goats, pigs & black & brown children: some of whom boast of a shirt, but quite as many not: these latter look less like human beings than I could have fancied any degradation could have produced. There are a good many black soldiers; it would be difficult, I should think, to pick out a less efficient body of men. Many of them only possess for arms, a wooden staff. Before returning to our boat, we walked across the town & came to a deep valley. Here I first saw the glory of tropical vegetation: Tamarinds, Bananas & Palms were flourishing at my feet. I expected a good deal, for I had read Humboldt's descriptions, & I was afraid of disappointments: how utterly vain such fear is, none can tell but those who have experienced what I to day have. It is not only the gracefulness of their forms or the novel richness of their colours, it is the numberless & confused associations that rush together on the mind, & produce the effect. I returned to the shore, treading on Volcanic rocks, hearing the notes of unknown birds, & seeing new insects fluttering about still newer flowers. It has been for me a glorious day, like giving to a blind man eyes, he is overwhelmed with what he sees & cannot justly comprehend it. Such are my feelings, & such may they remain.

JAN. 17th. Immediately after breakfast I went with the Captain to Quail Island. This is a miserable desolate spot, less than a mile in circumference. It is intended to fix here the observatory & tents; & will of course be a sort of head quarters to us. Uninviting as its first appearance was, I do not think the impression this day has



made will ever leave me. The first examining of Volcanic rocks, must to a Geologist be a memorable epoch, & little less so to the naturalist is the first burst of admiration at seeing Corals growing on their native rocks. Often whilst at Edinburgh, have I gazed at the little pools of water left by the tide: & from the minute corals of our own shore pictured to myself those of larger growth: little did I think how exquisite their beauty is & still less did I expect my hopes of seeing them would ever be realized. And in what a manner has it come to pass, never in the wildest castles in the air did I imagine so good a plan; it was beyond the bounds of the little reason that such day-dreams require. After having selected a series of geological specimens & collected numerous animals from the sea, I sat myself down to a luncheon of ripe tamarinds & biscuit; the day was hot, but not much more so than the summers of England & the sun tried to make cheerful the dark rocks of St Jago. The atmosphere was a curious mixture of haziness & clearness, distant objects were blended together: but every angle & streak of colour was brightly visible on the nearer rocks.

Let those who have seen the Andes be discontented with the scenery of St Jago. I think its unusually sterile character gives it a grandeur which more vegetation might have spoiled. I suppose the view is truly African, especially to our left, where some round sandy hills were only broken by a few stunted Palms. I returned to the ship heavily laden with my rich harvest, & have all evening been busily employed in examining its produce.

*Diary pp. 24-6*

JAN. 19th. I took a walk with Musters. I went to the West along the coast, & then returned by a more inland path. My imagination never pictured so utterly barren a place as this is. It is not the absence of vegetation solely that produces this effect: every thing adds to the idea of solitude: nothing meets the eye but plains strewn over with black & burnt rocks rising one above the other. And yet there was a grandeur in such scenery & to me the unspeakable pleasure of walking under a tropical sun on a wild & desert island. It is quite glorious the way my collections are increasing. I am even already troubled with the vain fear that there will be nobody in England who will have the courage to examine some of the less known branches. I have been so incessantly engaged with objects full of new & vivid interest that the three days appear of an indefinite length. I look back to the 16th as a period long gone by.

*Diary p. 26*

JAN. 21st. All day I have been working at yesterday's produce. Geology is at present my chief pursuit, & this island gives full scope for its enjoyment. There is something in the comparative nearness of time, which is very satisfactory whilst viewing Volcanic rocks. There have been two bright meteors passing from East to West.

*Diary p. 27*



JAN. 30th. Walked to the coast West of Quail Island with King, & collected numerous marine animals, all of extreme interest. I am frequently in the position of the ass between two bundles of hay; so many beautiful animals do I generally bring home with me. In the morning a few drops of rain fell.

*Diary* p. 31

FEB. 5th. This day or rather the 6th was originally fixed for sailing but the Captain is so much engaged with experiments on Magnetism, that the time is put off till tomorrow. I was engaged with my usual occupation of collecting marine animals in the middle of the day & examining them in the evening. Daily do I feel myself very hardly used, when on returning to the ship I find it growing dark soon after six o'clock. The days are exactly the same as in a dry hot summer in England, but it is very surprising the sun choosing to set before its accustomed time, about 8 o'clock.

6th. Went in a boat dredging for Corals; but did not succeed in obtaining any. Tomorrow we certainly sail. And I am glad of it, for I am becoming rather impatient to see tropical Vegetation in greater luxuriance than it can be seen here. Upon the whole the time has been for me of a proper length & has flown away very pleasantly. It is now three weeks, & – what may appear very absurd – it seems to me of less duration than one of its parts. During the first week every object was new & full of uncommon interest, & as Humboldt remarks, the vividness of an impression gives it the effect of duration; in consequence of this, those few days appeared to me a much longer interval than the whole three weeks does now.

*Diary* pp. 33–4

The geology of this island is the most interesting part of its natural history. On entering the harbour, a perfectly horizontal white band, in the face of the sea cliff, may be seen running for some miles along the coast, and at the height of about forty-five feet above the water. Upon examination, this white stratum is found to consist of calcareous matter, with numerous shells embedded, such as now exist on the neighbouring coast. It rests on ancient volcanic rocks, and has been covered by a stream of basalt, which must have entered the sea, when the white shelly bed was lying at the bottom. It is interesting to trace the changes, produced by the heat of the overlying lava, on the friable mass. For a thickness of several inches it is converted, in some parts, into a firm stone, as hard as the best freestone; and the earthy matter, originally mingled with the calcareous, has been separated into little spots, thus leaving the limestone white and pure. In other parts a highly crystalline marble has been formed, and so perfect are the crystals of carbonate of lime, that they can easily be measured by the reflecting goniometer. The change is even more extraordinary, where the lime has been caught up by the scoriaceous fragments of the lower surface of the stream; for it is there converted into groups of beautifully radiated fibres resembling arragonite. The beds of lava rise in successive gently-sloping plains, towards the interior, whence the deluges



of melted stone originally proceeded. Within historical times, no signs of volcanic activity have, I believe, been manifested in any part of St Jago. This state of quiescence is, probably, owing to the neighbouring island of Fogo being frequently in eruption. Even the form of a crater can but rarely be discovered on the summits of any of the red cindery hills; yet the more recent streams can be distinguished on the coast, forming a line of cliffs of less height, but stretching out in advance of those belonging to an older series: the height of the cliff thus affording a rude measure of the age.

During our stay, I observed the habits of some marine animals. A large *Aplysia* is very common. This sea-slug is about five inches long; and is of a dirty yellowish colour, veined with purple. At the anterior extremity, it has two pair of feelers; the upper ones of which resemble in shape the ears of a quadruped. On each side of the lower surface, or foot, there is a broad membrane, which appears sometimes to act as a ventilator, in causing a current of water to flow over the dorsal branchiae. It feeds on delicate sea-weeds, which grow among the stones in muddy and shallow water; and I found in its stomach several small pebbles, as in the gizzards of birds. This slug, when disturbed, emits a very fine purplish-red fluid, which stains the water for the space of a foot around. Besides this means of defence, an acrid secretion, which is spread over its body, causes a sharp, stinging sensation, similar to that produced by the *Physalia*, or Portuguese man-of-war.

I was much interested, on several occasions, by watching the habits of an Octopus or cuttle-fish. Although common in the pools of water left by the retiring tide, these animals were not easily caught. By means of their long arms and suckers, they could drag their bodies into very narrow crevices; and when thus fixed, it required great force to remove them. At other times they darted tail first, with the rapidity of an arrow, from one side of the pool to the other, at the same instant discolouring the water with a dark chestnut-brown ink. These animals also escape detection by a very extraordinary, chameleon-like, power of changing their colour. They appear to vary the tints, according to the nature of the ground over which they pass: when in deep water, their general shade was brownish purple, but when placed on the land, or in shallow water, this dark tint changed into one of a yellowish green. The colour, examined more carefully, was a French gray, with numerous minute spots of bright yellow: the former of these varied in intensity; the latter entirely disappeared and appeared again by turns. These changes were effected in such a manner, that clouds, varying in tint between a hyacinth red and a chestnut brown, were continually passing over the body. Any part being subjected to a slight shock of galvanism, became almost black: a similar effect, but in a less degree, was produced by scratching the skin with a needle. These clouds, or blushes, as they may be called, when examined under a glass, are described as being produced by the alternate expansions and contractions of minute vesicles, containing variously-coloured fluids.

This cuttle-fish displayed its chameleon-like power both during the act of swimming and whilst remaining stationary at the bottom. I was much amused by the various arts to escape detection used by one individual, which seemed fully aware that I was watching it. Remaining for a time motionless, it would then



stealthily advance an inch or two, like a cat after a mouse; sometimes changing its colour: it thus proceeded, till having gained a deeper part, it darted away, leaving a dusky train of ink to hide the hole into which it had crawled.

While looking for marine animals, with my head about two feet above the rocky shore, I was more than once saluted by a jet of water, accompanied by a slight grating noise. At first I did not know what it was, but afterwards I found out that it was the cuttle-fish, which, though concealed in a hole, thus often led me to its discovery. That it possesses the power of ejecting water there is no doubt, and it appeared to me certain that it could, moreover, take good aim by directing the tube or siphon on the under side of its body. From the difficulty which these animals have in carrying their heads, they cannot crawl with ease when placed on the ground. I observed that one which I kept in the cabin was slightly phosphorescent in the dark.

*Narrative* 3 pp. 5-7

On February 8th the *Beagle* sailed to the south-west towards South America. Three days later Darwin dispatched his first letter home.

C.D. TO DR ROBERT DARWIN

2 Days sail SW of St Jago, Lat: 11 N. Feb. 10th 1832

My dear Father

I have a long letter all ready written, but the conveyance by which I send this is so uncertain that I will not hazard it, but rather wait for the chance of meeting a homeward bound vessel. Indeed I only take this opportunity as perhaps you might be anxious, not having heard from me. All day long we have been in chace of a packet bound to Rio & have this evening overtaken her, tomorrow a boat will go on board of her & this letter will be conveyed to Rio & from thence to Shrewsbury or to the fire.

We have had a most prosperous quick & pleasant voyage. At first – indeed till the Canary Islands – I was unspeakably miserable from sea sickness & even now a little motion makes me squeamish. We did not stop at Madeira owing to its blowing fresh & at the Canary Islands they wanted to put us in strict quarantine for 12 days. Sooner than submit to that we sailed to Cape de Verds & arrived at St Jago on the 16th of January, having left England on the 27th of December. The voyage from Teneriffe to St Jago was very pleasant & our three weeks at it have been quite delightful. St Jago although generally reckoned very uninteresting was the most exciting. Of course the little Vegetation that there was, was purely tropical. And my eyes have already feasted on the exquisite form & colours of Cocoa nuts, Bananas & the beautiful orange trees. Hot houses give no idea of these forms, especially orange trees, which in their appearance are as widely different & superior to the English ones as their fresh fruit is to the imported. Natural History goes on excellently & I am incessantly occupied by new & most interesting animals. There is only one sorrowful drawback, the enormous period of time before I shall be back in England. I am often quite frightened when I look forward. As yet everything has answered brilliantly, I like everybody about the



ship, & many of them very much. The Captain is as kind as he can be. Wickham is a glorious fine fellow. And what may appear quite paradoxical to you is that I *literally* find a ship (when I am not sick) nearly as comfortable as a house. It is an excellent place for working & reading, & already I look forward to going to sea, as a place of rest, in short my home. I am throughly convinced that such a good opportunity of seeing the world might not [come] again for a century. I think, if I can so soon judge, I shall be able to do some original work in Natural History – I find there is little known about many of the tropical animals.

The effect of my sending this letter will be to spoil my longer one – but I was determined not to lose any opportunity (at Cape Verds there was none) & it is doubtful how long it will be before we arrive at Rio. The Albolhos banks on coast of Brazil may last us some time. As yet I have not felt the heat more than in England. In about a week it will be widely different. You will always find my letters home very badly written, as I am exactly in [the] case of having half an hours talk & then it would be a struggle what should come out first. This delay in letters will be a lesson not too soon to expect letters. Give my very best love to everybody & believe me my dearest Father,

Your most affectionate son  
Charles Darwin

*Darwin and Beagle* pp. 58–9

On February 15th the *Beagle* reached the isolated St Paul Rocks, lying in mid-Atlantic close to the Equator. The next day a party went ashore.

FEB. 15th. Saw the rocks of St Paul's right ahead: heaved to during the night, & this morning (16th) we were a few miles distant from them. When within 3 miles, two boats were lowered, one with Mr Stokes for surveying the island, the other with Mr Wickham & myself for geologizing & shooting. St Paul's may be considered as the top of a submarine mountain. It is not above 40 feet above the sea, & about half a mile in circumference. Bottom could not be found within a mile of the Island, & if the depth of the Atlantic is as great as it is usually supposed, what an enormous pyramid this must be.

We had some difficulty in landing as the long swell of the open sea broke with violence on the rocky coast. We had seen from a distance large flocks of sea-birds soaring about, & when we were on the Island a most extraordinary scene was presented. We were surrounded on every side by birds, so unaccustomed to men that they would not move. We knocked down with stones & my hammer, the active and swift tern. Shooting was out of the question, so we got two of the boat's crew & the work of slaughter commenced. They soon collected a pile of birds, & hats full of eggs.

Whilst we were so active on shore, the men in the boat were not less so. They caught a great number of fine large fish & would have succeeded much better had not the sharks broken so many of their hooks & lines: they contrived to land three of these latter fish, & during our absence 2 large ones were caught from the ship. We returned in great triumph with our prey, but were a good deal fatigued. The



island is only 50 miles from the Equator, & the rocks being white from the birds' dung, reflected a glaring heat. The birds were only of two sorts, Booby and Noddys, & these with a few insects were the only organized beings that inhabited this desolate spot. In the evening the ceremonies for crossing the line commenced. The officer on watch reported a boat ahead. The Captain turned 'hands up, shorten sail', and we heaved to in order to converse with Mr Neptune. The Captain held a conversation with him through a speaking trumpet, the result of which was that he would in the morning pay us a visit.

*Diary* pp.35-6

St Paul Rocks, or Peñedo de San Pedro, were seen on the horizon at sunset of the 15th. They appeared extremely small, being about eight miles distant; and had we not been looking out for them, I doubt whether they would have attracted attention. Excepting 'Las Hormigas', on the coast of Peru, I never saw such mere rocks at so great a distance from any land.

At daylight next morning, two boats were sent to land upon, and examine them; while the Beagle sailed round this 'sunk mountain top', sounding, and taking angles. Good observations were made during the day, as the sky was clear, and the water smooth.

When our party had effected a landing through the surf, and had a moment's leisure to look about them, they were astonished at the multitudes of birds which covered the rocks, and absolutely darkened the sky. Mr Darwin afterwards said, that till then he had never believed the stories of men knocking down birds with sticks; but there they might be kicked, before they would move out of the way.

The first impulse of our invaders of this bird-covered rock, was to lay about them like schoolboys; even the geological hammer at last became a missile. 'Lend me the hammer?' asked one. 'No, no,' replied the owner, 'you'll break the handle'; but hardly had he said so, when, overcome by the novelty of the scene, and the example of those around him, away went the hammer, with all the force of his own right-arm.

While our party were scrambling over the rock, a determined struggle was going on in the water, between the boats' crews and sharks. Numbers of fine fish, like the groupars (or garoupas) of the Bermuda Islands, bit eagerly at baited hooks put overboard by the men; but as soon as a fish was caught, a rush of voracious sharks was made at him, and notwithstanding blows of oars and boat hooks, the ravenous monsters could not be deterred from seizing and taking away more than half the fish that were hooked.

*Narrative* 2 p.56

FEB. 17th. We have crossed the Equator, & I have undergone the disagreeable operation of being shaved. About 9 o'clock this morning we poor 'griffins', two & thirty in number, were put altogether on the lower deck. The hatchways were battened down, so we were in the dark & very hot. Presently four of Neptune's constables came to us, & one by one led us up on deck. I was the first & escaped



easily: I nevertheless found this watery ordeal sufficiently disagreeable. Before coming up, the constable blindfolded me & thus lead along, buckets of water were thundered all around; I was then placed on a plank, which could be easily tilted up into a large bath of water. They then lathered my face & mouth with pitch & paint, & scraped some of it off with a piece of roughened iron hoop: a signal being given I was tilted head over heels into the water, where two men received me & ducked me. At last, glad enough, I escaped: most of the others were treated much worse: dirty mixtures being put in their mouths & rubbed on their faces. The whole ship was a shower bath, & water was flying about in every direction: of course not one person, even the Captain, got clear of being wet through.

*Diary* p.36

At sunset that day we were out of sight of St Paul (or St Peter), and soon after dark were hailed by the gruff voice of a pseudo-Neptune. A few credulous novices ran upon the forecastle to see Neptune and his car, and were received with the watery honours which it is customary to bestow, on such occasions.

Next morning we crossed the Equator, and the usual ceremonies were performed.

Deep was the bath, to wash away all ill;  
Notched was the razor – of bitter taste the pill.  
Most ruffianly the barber looked – his comb was trebly nailed –  
And water, dashed from every side, the neophyte assailed.

The disagreeable practice alluded to has been permitted in most ships, because sanctioned by time; and though many condemn it as an absurd and dangerous piece of folly, it has also many advocates. Perhaps it is one of those amusements, of which the omission might be regretted. Its effects on the minds of those engaged in preparing for its mummeries, who enjoy it at the time, and talk of it long afterwards, cannot easily be judged of without being an eye-witness.

*Narrative* 2 pp.57–8

Mr Darwin has related his landing on St Paul's Rocks near the Equator, but he makes no mention of the amusing incidents usually observed on crossing the Line, too trivial of course for his pen, but they never could be effaced from his memory. On approaching Neptune's whereabouts as usually looked for by seamen, the Ship's Company became up to any and every sort of devilment, and the usual liberty to indulge in the ceremonial observances was accorded, discipline for the nonce being partially dispensed with. Father Neptune must have his tribute, and it was freely given him. The story has been often told, but the effect produced on the young naturalist's mind was unmistakably remarkable. His first impression was [that] the Ship's crew from Captain downwards had gone off their heads. 'What fools these sailors make of themselves' he said as he descended the companion ladder to wait below till he was wanted.

The Captain received his godship and Amphitrite his wife with becoming





*Crossing the line*

solemnity: Neptune was surrounded by a set of the most ultra-demonical looking beings that could be well imagined. Stripped to the waist, their naked arms and legs bedaubed with every conceivable color which the ship's stores could turn out, the orbits of their eyes exaggerated with broad circles of red and yellow pigments, those demons danced a sort of nautical war dance, exulting on the fate awaiting their victims below.

Putting his head down the after Companion, the Capt called out 'Darwin look up here'! Up came the young naturalist, in wonderment but yet prepared for any extravagance in the world that seamen could produce. A gaze for a moment at the scene on deck was sufficient, he was convinced he was amongst madmen, and giving one yell disappeared again down the ladder. He was of course the first to be called by the official secretary, and Neptune received him with grace and courtesy, observing that in deference to his high standing on board as a friend and messmate of the Captain, his person would be held sacred from the ordinary rites observed in the locality. Of course Mr Darwin readily entered into the fun, and



submitted to a few buckets of water thrown over him and the Captain as they sat together by one of the youngsters, as if by accident.

[From P. G. King's 'Account of the voyage of the Beagle', written in 1891. Cambridge University Library, Darwin MS. 106/7.]

On February 28th the *Beagle* anchored in the port of Bahia (now known as Salvador), and Darwin was able to post a longer letter to his father.

C.D. TO DR ROBERT DARWIN

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

(Brazils) Bahia or St Salvador

My dear Father

I am writing this on the 8th of February, one day's sail past St Jago (Cape de Verd), & 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 & give a short account of our progress. We sailed, as you know, on the 27th of December & have been fortunate enough to have had from that time to the present a fair & moderate breeze. It afterwards proved that we escaped a heavy gale in the Channel, another off Madeira, & another on [the] coast of Africa. But in escaping the gale we felt its consequence – a heavy sea. In the Bay of Biscay there was a long & continued swell & the misery I endured from sea-sickness is far 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 24 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. On the 4th of January we were not many miles from Madeira, but as there was a heavy sea running & the Island lay to Windward it was not thought worth while to beat up to it. It afterwards has turned out it was lucky we saved ourselves the trouble: I was much too sick even to get up to see the distant outline. On the 6th in the evening we sailed into the harbour of Santa Cruz. I now first felt even moderately well, & I was picturing to myself all the delights of fresh fruit growing in beautiful valleys, & reading Humboldt's descriptions of the Islands glorious views. When perhaps you may nearly guess at our disappointment, when a small pale man informed us we must perform a strict quarantine of 12 days. There was a deathlike stillness in the ship; till the Captain cried 'Up Jib', & we left this long wished for place.

We were becalmed for a day between Teneriffe & the grand Canary & 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 visiting this glorious island. 'Tell Eyton never to forget either [the] Canary islands or S 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 repent 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, & fully occupied my time in my cabin, & on deck the weather was so delightful, & clear, that the sky & water together made a picture. On the 16th we arrived at Port Praya, the capital of the Cape de Verds, & there we remained 23 days, viz till yesterday the 7th of February.

The time has flown away most delightfully, indeed nothing can be pleasanter; exceedingly busy, & that business both a duty & 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 kinds of Nat. History. I find the descriptions scarcely worth anything of many of the commoner animals that inhabit the Tropic. I allude of course to those of the lower classes. Geologising in a Volcanic country is most delightful, besides the interest attached to itself it leads you into most beautiful & retired spots. Nobody but a person fond of Nat. History can imagine the pleasure of strolling under Cocoa nuts in a thicket of Bananas & Coffee plants, & an endless number of wild flowers. And this Island that has given me so much instruction & 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 dissimilarity 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 & those raptures badly expressed.

I find my collections are increasing wonderfully, & from Rio I think I shall be obliged to send a Cargo home. 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 & observing in the different branches of Natural Hist. 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, & being cramped makes one so methodical, 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 to home after staying away from it. In short I find a ship a very comfortable house, with everything you want, & 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 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 & young King & Stokes & indeed all of them. The Captain continues steadily very kind & 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, & 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 & stand the little heat we have had as yet as well as anybody. We are now sailing for Fernando Norunho off the coast of Brazil, where we shall not stay very long, & then examine the shoals between there & Rio, touching perhaps at Bahia. I will finish this letter when an opportunity of sending it occurs.

Feb 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 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 & being shaved. This most disagreeable operation consists in having your face rubbed with paint & tar which forms a lather for a saw which represents the razor & 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 & 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 Nat. History of all these unfrequented spots most exceedingly interesting, especially the geology. I have written this much in order to save time at Bahia.

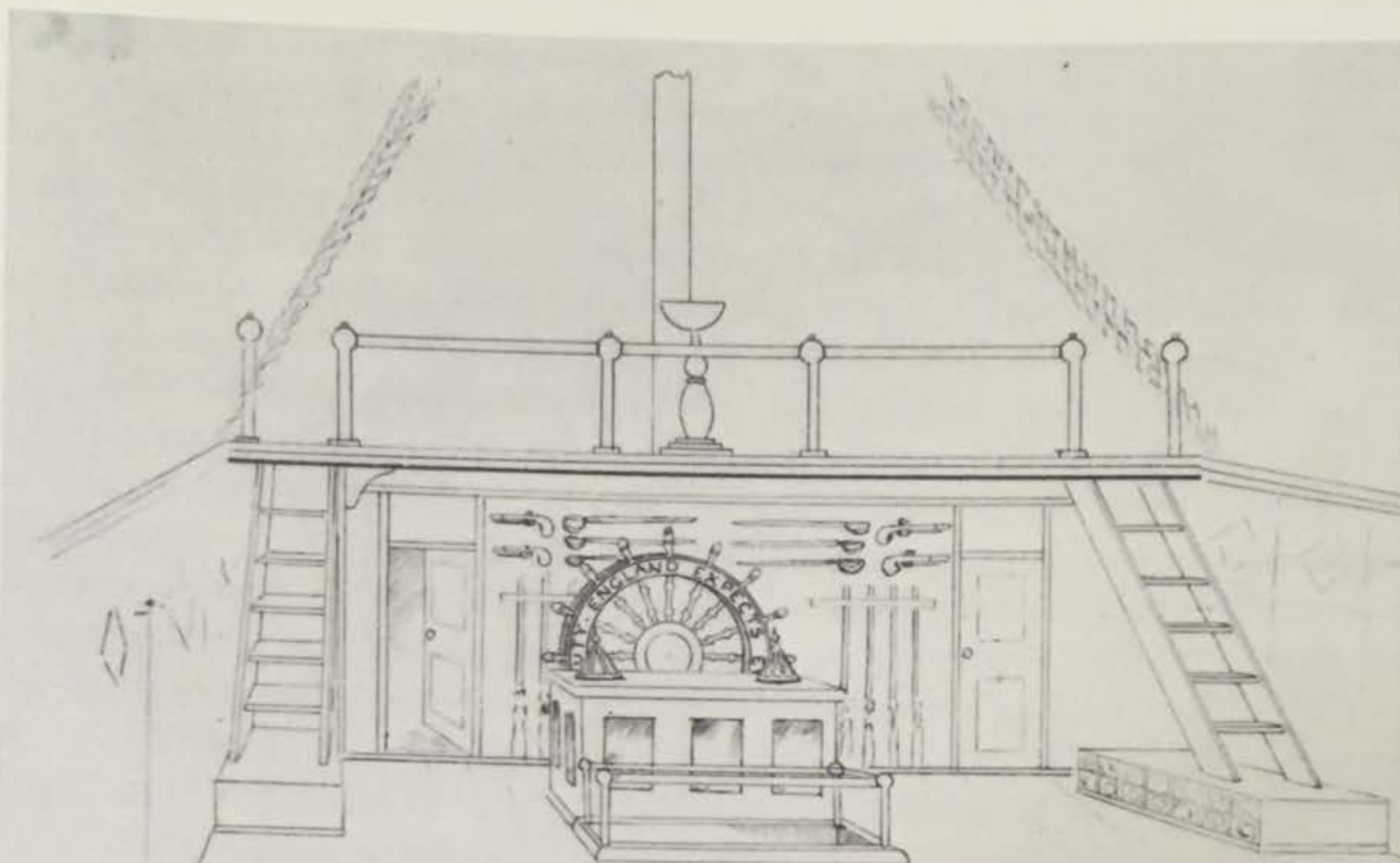
Decidedly the most striking thing in the Tropics is the novelty of the vegetable forms. Cocoa nuts could well be imagined from drawings if you add to them a graceful lightness which no European tree partakes of. Bananas & Plantains are exactly the same as those in hothouses: the acacias or tamarinds 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 portugul laurel in the darkness of their tint & infinitely exceed it in beauty of form. Cocoa-nuts, Papaws, the light-green Bananas & oranges loaded with fruit generally surrounded the more luxuriant villages. Whilst viewing such scenes, one feels the impossibility that any description should come near the mark, much less be overdrawn.

March 1st, Bahia or St Salvador. I arrived at this place on the 28th of Feb & 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 antient town of Bahia; it is fairly embosomed in a luxuriant wood of beautiful trees – & situated on a steep bank, overlooks the calm waters of the great bay of All Saints. The houses are white & lofty, & from the windows being narrow & long have a very light & elegant appearance. Convents, porticos & public buildings vary the uniformity of the

(copied from my journal)

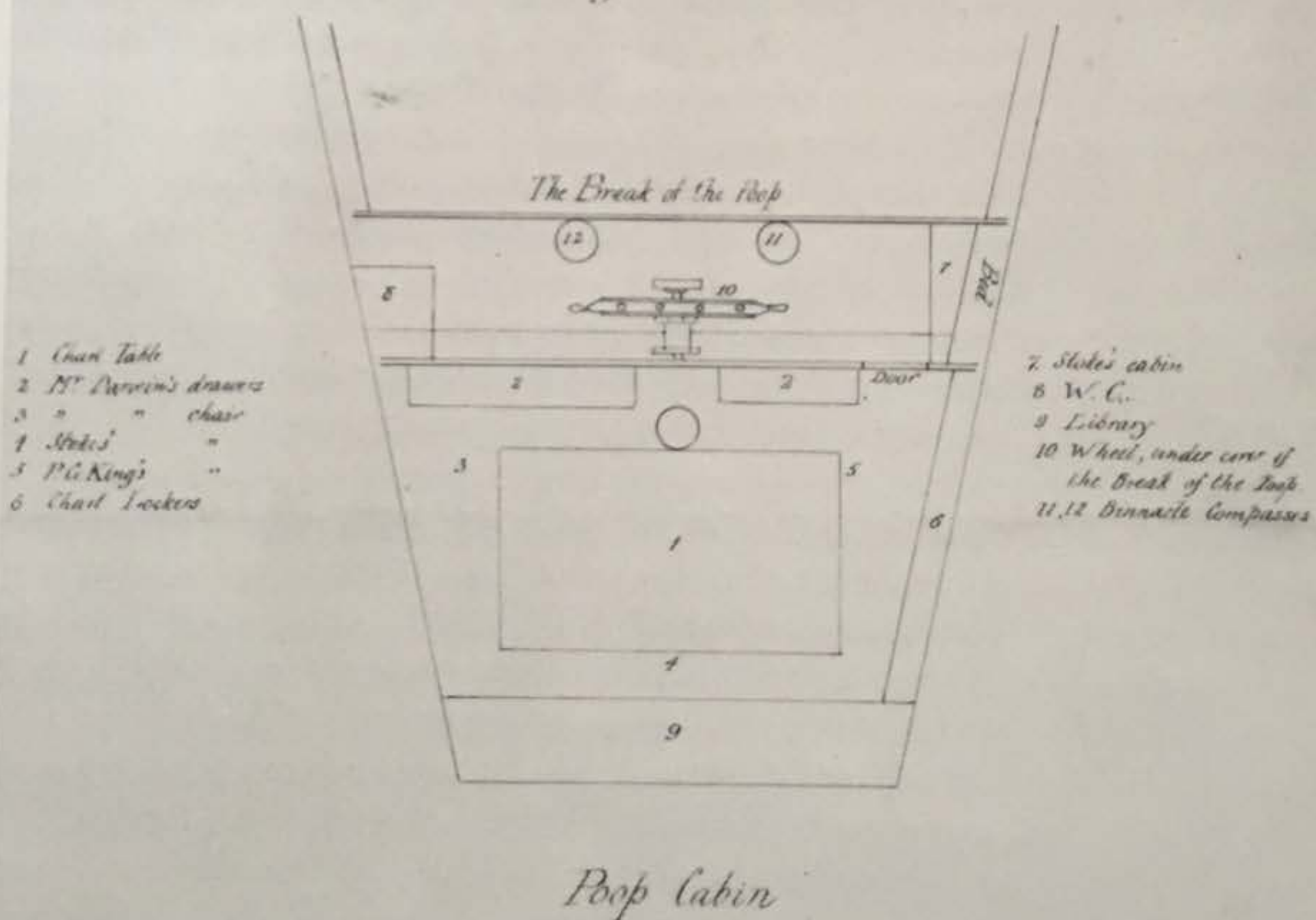
houses; the bay is scattered over with large ships, in short & what can be said





Note. The circle in centre of wheel was a drawing by Esart, the artist, of Neptune with his trident.

### *H.M.S. Beagle's Quarter-deck*



*Quarter-deck and poop cabin*



more it is one of the finest views in the Brazils'. But the exquisite glorious pleasure of walking amongst such flowers & such trees cannot be comprehended but by those who have experienced it. Although in so low a Latitude the weather 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 a [notion] of tropical countries, *study* Humboldt. Skip t[he] scientific parts & 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 & that I am sure it will be a great pity if [he] does not make a start. This letter will go [on] the 5th & 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 from [me]. 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 Albrolos shoals. Tell Eyton as far as my experience goes let him study Spanish, French, Drawing & Humboldt. I do sincerely hope to hear of (if not to see him) in S 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 maneuvering, so much so that [the] commanding officer says we need follow his 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 to day 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 & recollect they are generally written in the evening after my days 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, & 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 any body 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 rapturize again: but I give myself great credit in not being crazy out of pure delight. Give my love to every soul at home, & to the Owens. I think ones affections, like other good things, flourish & increase in these tropical regions.

The conviction that I am walking in the new world is even yet marvellous in my own eyes, & I daresay it is little less so to you, the receiving a letter from a son of yours in such a quarter.

Believe me, My dearest Father, Your most affectionate son  
Charles Darwin



While FitzRoy checked the performance of his chronometers and the *Beagle* took on water and provisions, Darwin had his first taste of tropical scenery. He was not disappointed.

FEB 28th. About 9 o'clock we were near to the coast of Brazil; we saw a considerable extent of it, the whole line is rather low & irregular, & from the profusion of wood & verdure of a bright green colour. About 11 o'clock we entered the bay of All Saints, on the Northern side of which is situated the town of Bahia or San Salvador. It would be difficult [to] imagine, before seeing the view, anything so magnificent. It requires, however, the reality of nature to make it so. If faithfully represented in a picture, a feeling of distrust would be raised in the mind, as I think is the case in some of Martin's<sup>1</sup> views. The town is fairly embossed in a luxuriant wood & situated on a steep bank overlooks the calm waters of the great bay of All Saints. The houses are white & lofty & from the windows being narrow & long have a very light & elegant appearance. Convents, Porticos & public buildings vary the uniformity of the houses: the bay is scattered over with large ships; in short the view is one of the finest in the Brazils. But these beauties are as nothing compared to the Vegetation; I believe from what I have seen Humboldt's glorious descriptions are & will for ever be unparalleled: but even he with his dark blue skies & the rare union of poetry with science which he so strongly displays when writing on tropical scenery, with all this falls far short of the truth. The delight one experiences in such times bewilders the mind; if the eye attempts to follow the flight of a gaudy butter-fly, it is arrested by some strange tree or fruit; if watching an insect one forgets it in the stranger flower it is crawling over; if turning to admire the splendour of the scenery, the individual character of the foreground fixes the attention. The mind is a chaos of delight, out of which a world of future & more quiet pleasure will arise. I am at present fit only to read Humboldt; he like another sun illumines everything I behold.

29th. The day has passed delightfully: delight is however a weak term for such transports of pleasure: I have been wandering by myself in a Brazilian forest: amongst the multitude it is hard to say what set of objects is most striking; the general luxuriance of the vegetation bears the victory, the elegance of the grasses, the novelty of the parasitical plants, the beauty of the flowers, the glossy green of the foliage, all tend to this end. A most paradoxical mixture of sound & silence pervades the shady parts of the wood: the noise from the insects is so loud that in the evening it can be heard even in a vessel anchored several hundred yards from the shore: yet within the recesses of the forest a universal stillness appears to reign. To a person fond of Natural history such a day as this brings with it pleasure more acute than he ever may again experience. After wandering about for some hours, I returned to the landing place. Before reaching it I was overtaken by a Tropical storm. I tried to find shelter under a tree so thick that it would never have been penetrated by common English rain, yet here in a couple of minutes, a little torrent flowed down the trunk. It is to this violence we must attribute the verdure in the bottom of the wood: if the showers were like those of a colder

<sup>1</sup>Presumably John Martin (1789–1854), the historical and landscape painter. RDK



clime, the moisture would be absorbed or evaporated before reaching the ground.

*Diary* pp. 39-40

In a private letter to Captain Beaufort dated March 5, 1832, FitzRoy wrote:

'Darwin is a very sensible, hard-working man and a very pleasant messmate. I never saw a "shore-going fellow" come into the ways of a ship so soon and so thoroughly as Darwin. I cannot give a stronger proof of his good sense and disposition than by saying "Everyone respects and likes him."' It is pleasant to find that what FitzRoy could say of Darwin after a few months' experience was substantially repeated by his other shipmates after five years' knowledge of his character. Thus, for instance, Admiral Mellersh, who was mate on board the *Beagle*, wrote: 'I think he was the only man I ever knew against whom I never heard a word said; and as people when shut up in a ship for five years are apt to get cross with each other, that is saying a good deal.'

FitzRoy goes on: 'He was terribly sick until we passed Teneriffe, and I sometimes doubted his fortitude holding out against such a beginning of the campaign. However, he was no sooner on his legs than anxious to set to work, and a child with a new toy could not have been more delighted than he was with St Jago. It was odd to hear him say, after we left Porto Praya, "Well, I am *glad* we are *quietly* at sea again, for I shall be able to arrange my collections and set to work more methodically." He was sadly disappointed by not landing at Teneriffe and not seeing Madeira, but there was no alternative.'

Darwin had written to his sister: 'I daresay you expect I shall turn back at Madeira; if I have a morsel of stomach left I won't give up.' With regard to this part of the voyage, he wrote in 1846: 'Farewell, dear FitzRoy, I often think of your many acts of kindness to me, and not seldomest on the time, no doubt quite forgotten by you, when before making Madeira, you came and arranged my hammock with your own hands, and which, as I afterwards heard, brought tears into my father's eyes.'

It was at St Jago, in the Cape de Verd Islands, that his career as a discoverer in geology began. He wrote in his 'Autobiography': 'That was a memorable hour to me, and how distinctly I can call to mind the low cliff of lava beneath which I rested, with the sun glaring hot, and a few strange desert plants growing near, and with living corals in the tidal pools at my feet.'

In an official letter to the Hydrographer dated March 4, 1832, FitzRoy had written:

'Mr Darwin has found abundant occupation already, both at sea and on shore; he has obtained numbers of curious though small inhabitants of the ocean, by means of a Net made of Bunting, which might be called a floating or surface Trawl, as well as by searching the shores and the land. In Geology he has met with far much more interesting employment in Porto Praya than he had at all anticipated. From the manner in which he pursues his occupation, his good sense, inquiring disposition, and regular habits, I am certain you will have good reason to feel much satisfaction in the reflection that such a person is on board the *Beagle*, and the



certainly that he is taking the greatest pains to make the most of time and opportunity.'

[Sir Francis Darwin, quoting in 1912 from FitzRoy-Beaufort letters that have since been lost.]

MARCH 5th. King & myself started at 9 o'clock for a long naturalizing walk. Some of the valleys were even more beautiful than any I have yet seen. There is a wild luxuriance in these spots that is quite enchanting. One of the great superiorities that Tropical scenery has over European is the wildness even of the cultivated ground. Cocoa Nuts, Bananas, Plantain, Oranges, Papaws are mingled as if by Nature, & between them are patches of the herbaceous plants such as Indian corn, Yams & Cassada: & in this class of views, the knowledge that all conduces to the subsistence of mankind, adds much to the pleasure of beholding them. We returned to the ship about  $\frac{1}{2}$  after 5 o'clock & during these eight hours we scarcely rested one. The sky was cloudless & the day very hot, yet we did not suffer much. It appears to me that the heat merely brings on indolence, & if there is any motive sufficient to overcome this it is very easy to undergo a good deal of fatigue. During the walk I was chiefly employed in collecting numberless small beetles & in geologising. King shot some pretty birds & I a most beautiful large lizard. It is a new & pleasant thing for me to be conscious that naturalizing is doing my duty, & that if I neglected that duty I should at same time neglect what has for some years given me so much pleasure.

*Diary* pp.41-2

On March 18th the *Beagle* sailed south-eastwards for the Abrolhos Island, an uninhabited group for which the accuracy of the chart was to be checked.

MARCH 21st. The greatest event of the day has been catching a fine young shark with my own hook. It certainly does not require much skill to catch them, yet this no way diminishes the interest. In this case the hook was bigger than the palm of the hand & the bait only a bit of salted pork just sufficient to cover the point. Sharks when they seize their prey turn on their backs; no sooner was the hook astern, than we saw the silvery belly of the fish & in a few moments we hauled him on deck.

*Diary* p.45

As far as we had time to examine, the chart of these islands, by the Baron Roussin, appeared to be satisfactory; but the soundings are so very irregular in the vicinity of the Abrolhos, that little dependence could be placed on the lead. More than once we had four or five fathoms under one side of the vessel, and from fifteen to twenty under the other. These sudden and startling changes, called by the French, 'Sauts de sonde,' are very unpleasant and perplexing.

The tide, or rather current, which we found when lying at anchor near the islets, set continually to the southward, varying in strength from half a mile to a mile and a half an hour; but we had only three days' experience.



I had imagined, from what I had heard, that the rock of which these islets were chiefly composed was coral; but was surprized to find only coralline growing upon gneiss or sandstone.

While sounding near the Abrolhos we made a great number of experiments with Massey's lead, in order to verify its qualities; and found it [to] agree remarkably well with the common lead, while in less than forty fathoms, but differ from it frequently when the depth of water exceeded seventy fathoms; and wholly fail when used in upwards of one hundred and twenty fathoms. The failure, in great depths, was in consequence of the small hollow cylinder, to which the vanes were attached, bursting, or rather, being compressed by the weight of water.

We anchored near the islets, at dusk, on the 28th [March], after being in frequent anxiety, owing to sudden changes in the depth of water; and next morning, moved to a better berth at the west side, very near them. They are rather low, but covered with grass, and there is a little scattered brushwood. The highest point rises to about a hundred feet above the sea. Their geological formation, Mr Darwin told me, is of gneiss and sandstone, in horizontal strata. When our boats landed, immense flights of birds rose simultaneously, and darkened the air. It was the breeding and moulting season; nests full of eggs, or young unfledged birds, absolutely covered the ground, and in a very short time our boats were laden with their contents.

A large black bird, with a pouch like that of a pelican, but of a bright red colour, was very remarkable, as it hovered, or darted among the bright verdure, and at a distance looked handsome; but when seen close, it at once descended to the level of a carrion-eating cormorant or buzzard.

Turtle are to be found at times: we observed the shell and skeleton of an extremely large one lying on a sandy spot at the north side of the northern islet. Some very fine fish, of the cod kind, were caught; one was so large, that, until hauled on board, it was supposed to be a shark. The anchorage is good, and easy of access: all swell is stopped by the shallow places, and by the islets themselves. There is no fresh water.

If a general reader should honour these pages by his perusal, and find such details about wood, water, fish, birds, &c., at places about which few know, and still fewer care – extremely tiresome, he will of course pass them over; but, in my own exculpation, I must beg to be permitted to remind him that the *Beagle* was employed by Government, to obtain practical information likely to be useful to shipping; and that I might neglect my duty by omitting to mention such matters, when speaking of places which are seldom visited, and hitherto but slightly known.

*Narrative* 2 pp.64–5

After two days of surveying in the Abrolhos, the *Beagle* resumed her course southwards. Fifty miles east of Rio de Janeiro, she rounded Cabo Frio, where H.M.S. *Thetis* had been wrecked with the loss of twenty-five of her crew on December 5th 1830.



APRIL 1st. All hands employed in making April fools. At midnight nearly all the watch below was called up in their shirts; carpenters for a leak: quarter masters, that a mast was sprung: midshipmen, to reef top-sails. All turned in to their hammocks again, some growling, some laughing. The hook was much too easily baited, for me not to be caught: Sullivan cried out: 'Darwin, did you ever see a Grampus: Bear a hand then.' I accordingly rushed out in a transport of Enthusiasm, & was received by a roar of laughter from the whole watch.

2nd. A rainy, squally morning, very unusual at this time of year in these Latitudes; being now about 130 miles East of Rio. A large flock of Mother Carys chickens are hovering about the stern in same manner as swallows do on a calm summer evening over a lake. A flying fish fell on the deck this morning; it struck the mast high up, near the main yard: sticking to the fish was a crab, the pain of which caused perhaps this unusual degree of action.

3rd. This morning Cape Frio was in sight: it is a memorable spot to many in the Beagle, as being the scene of the disgraceful wreck of the Thetis. All day we ran along the coast & in the evening drew near to the harbour of Rio. The whole line is irregularly mountainous, & interspersed with hills of singular forms. The opening of the port is recognised by one of these, the well known Sugar-loaf. As it would be impossible to get a good anchorage or enjoy the view so late in the evening, the Captain has put the ship's head to the wind & we shall, to my great joy, cruize about for the night. We have seen great quantities of shipping; & what is quite as interesting, Porpoises, Sharks & Turtles; altogether, it has been the most idle day I have spent since I left England. Everybody is full of anxiety about letters & news papers. Tomorrow morning our fates will be decided.

*Diary* pp.46-7

There was no reason to suspect the existence of much current near Cape Frio, when the Thetis was lost, except on such general grounds as those just mentioned, because no pilot, as far as I know, was aware of such a fact. With strong southerly winds, ships of large size do not often leave Rio de Janeiro – coasting vessels never – therefore few persons could have experienced its effect when sailing from the port; and when approaching Rio in similar weather, vessels sail before a fair wind, steer by sight of the land, and take little notice of the log: besides which, they then employ but three or four hours in passing through that space of sea where the Thetis was detained nineteen.

In all probability, such a current as that which drove the Thetis on the rocks is only to be found during southerly winds, and in the summer season of that climate, when the general set of the current is along the coast, towards the south and west.

If a man of war is accidentally lost, a degree of astonishment is expressed at the unexpected fate of a fine ship, well found, well manned, and well officered; and blame is imputed to some one: but before admitting a hastily-formed opinion as fact, much inquiry is necessary. As in the case of the Thetis, an English man-of-war may incur risk in consequence of a praiseworthy zeal to avoid delaying in port,



as a merchant-ship would probably be obliged to do, from her being unable to beat out against an adverse wind, and, like that frigate, may be the first to prove the existence of an unsuspected danger.

Those who never run any risk; who sail only when the wind is fair; who heave to when approaching land, though perhaps a day's sail distant; and who even delay the performance of urgent duties until they can be done easily and quite safely; are, doubtless, extremely prudent persons – but rather unlike those officers whose names will never be forgotten while England has a navy.

*Narrative* 2 pp. 71–2

The *Beagle* came to anchor in the harbour of Rio de Janeiro on the evening of April 4th.

APRIL 4th. The winds being very light we did not pass under the Sugar loaf till after dinner: our slow cruize was enlivened by the changing prospects of the mountains; sometimes enveloped by white clouds, sometimes brightened by the sun, the wild & stony peaks presented new scenes. When within the harbor the light was not good, but like to a good picture this evening's view prepared the mind for the morrow's enjoyment. In most glorious style did the little *Beagle* enter the port & lower her sails alongside the Flag ship. We were hailed that from some trifling disturbances we must anchor in a particular spot. Whilst the Captain was away with the commanding officer, we tacked about the harbor & gained great credit from the manner in which the *Beagle* was manned & directed. Then came the ecstasies of opening letters, largely exciting the best & pleasantest feelings of the mind; I wanted not the floating remembrance of ambition now gratified, I wanted not the real magnificence of the view to cause my heart to revel with intense joy; but united with these, few could imagine & still fewer forget the lasting & impressive effect.

5th. In the morning I landed with Earl at the Palace steps; we then wandered through the streets, admiring their gay & crowded appearance. The plan of the town is very regular, the lines, like those in Edinburgh, running parallel, & others crossing them at right angles. The principal streets leading from the squares are straight & broad; from the gay colours of the houses, ornamented by balconys, from the numerous Churches & Convents & from the numbers hurrying along the streets the city has an appearance which bespeaks the commercial capital of Southern America. The morning has been for me very fertile in plans: most probably I shall make an expedition of some miles into the interior, – & at Botofogo Earl & myself found a most delightful house which will afford us most excellent lodgings.

I look forward with the greatest pleasure to spending a few weeks in this most quiet & most beautiful spot. What can be imagined more delightful than to watch Nature in its grandest form in the regions of the Tropics? We returned to Rio in great spirits & dined at a Table d'Hôte, where we met several English officers serving under the Brazilian colours. Earl makes an excellent guide, as he formerly lived some years in the neighbourhead: it is calamitous how short & uncertain life





*Mole, palace and cathedral at Rio de Janeiro*

is in these countries: to Earl's enquiries about the number of young men whom he left in health & prosperity, the most frequent answer is 'He is dead & gone'. The deaths are generally to be attributed to drinking: few seem able to resist the temptation, when exhausted by business in this hot climate, of strongly exciting themselves by drinking spirits.

*Diary pp.47-8*

Darwin made plans for an expedition on horseback to an estate on the Rio Macao belonging to Mr Patrick Lennon.

APRIL 6th. The day has been frittered away in obtaining the passports for my expedition into the interior. It is never very pleasant to submit to the insolence of men in office; but to the Brazilians, who are as contemptible in their minds as their persons are miserable, it is nearly intolerable. But the prospect of wild forests tenanted by beautiful birds, Monkeys & Sloths, & lakes by Cavies & Alligators, will make any Naturalist lick the dust even from the foot of a Brazilian.

*Diary pp.48-9*

Before departing he wrote to his sister Caroline.

C.D. TO MISS CAROLINE DARWIN

[*Beagle*, at sea]

My dear Caroline.

We are now about a hundred miles East of Rio & tomorrow the 3d of April we



expect to arrive at the capital of the Brazils. My last letter was from Bahia, which place the Beagle sailed from on the 18th of last month. On the whole I much enjoyed my first visit to S America. I was however very unfortunate in being confined to my hammock for eight days by a prick on the knee becoming much inflamed. Bahia has one great disadvantage in being situated on so large a space: that it was impossible for us to walk but in one direction. Luckily it was by far the most beautiful. The scenery here chiefly owes its charms to the individual forms of the vegetation: when this is united to lofty hills & a bold outline, I am quite sure the incapability of justly praising it will be almost distressing. I talk of *enjoying Bahia* in order to be moderate: but this enjoyment, weighted with 8 days confinement, is well worth all the misery I endured between England & Teneriffe.

I am looking forward with great interest for letters, but with very little pleasure to answering them. It is very odd what a difficult job I find this same writing letters to be. I suppose it is partly owing to my writing everything in my journal: but chiefly to the number of subjects, which is so bewildering that I am generally at a loss either how to begin or end a sentence, and this all hands must allow to be an objection. The *mean* temperature of Bahia was  $80^{\circ}$ , being more accustomed to heat I suffered less from it than at Praya, where mean temp was  $73^{\circ}$ . The great difference of climate in the Tropics & colder zones consists in the higher temps of the nights. A mean of  $84^{\circ}$  for the whole year at Guyara in Columbia is the hottest place in the world. So certainly I have experienced a very considerable degree. To me it is most enjoyable: I had expected to wish for the cold thawing days which you have lately been shivering under. No, give me the regions of Palms and Oranges & away with frost & snow. It requires a little additional energy to set about anything & a good deal more to resist a siesta after dinner: when having so indulged one wakes bathed in perspiration but with the skin as cool as a young child.

We shall in all probability stay more than a month at Rio. I have some thoughts, if I can find tolerably cheap lodgings, of living in a beautiful village about 4 miles from the town. It would be excellent for my collection & for knowing the Tropics, moreover I shall escape cauking & painting & various other bedevilments which Wickham is planning. The part of my life as sailor (& I am becoming one i.e. knowing ropes & how to put the ship about &c) is unexpectedly pleasant; it is liking the bare living on the water. I am the only person on this ship who wishes for long passages: but of course I cautiously bargain with Aeolus when I pray to him that with the winds he may keep the sea equally quiet. Coming out of Bahia my stomach was but just able to save its credit. I will finish this letter full of I, I, I, when at Rio.

Rio de Janeiro, April 5th. I this morning received your letter of Decr 31 & Catherine's of Feb 4th. We lay to during last night as the Captain was determined we should see the harbor of Rio & be ourselves seen in broad daylight. The view is magnificent & will improve on acquaintance, it is at present rather too novel to behold mountains as rugged as those of Wales clothed in an evergreen vegetation & the tops ornamented by the light form of the Palm. The city, gaudy with its towers & Cathedrals, is situated at the base of these hills & commands a vast bay



studded with men of war, the flags of which bespeak every nation. We came in first rate style alongside the Admiral's ship, & we to their astonishment took in every inch of canvass & then immediately set it again: A sounding ship doing such a perfect manoeuvre with such certainty & rapidity is an event hitherto unknown in that class. It is a great satisfaction to know that we are in such beautiful order & discipline.

In the midst of our Tactics the bundle of letters arrived. 'Send them below', thundered Wickham, 'every fool is looking at them & neglecting his duty'. In about an hour I succeeded in getting mine, the sun was bright & the view resplendent, our little ship was working like a fish; so I said to myself, I will only just look at the signatures: it would not do; I sent wood & water, Palms & Cathedrals to old Nick & away I rushed below, there to feast over the thrilling enjoyment of reading about you all: at first the contrast of home vividly brought before one's eyes makes the present more exciting, but the feeling is soon divided & then absorbed by the wish of seeing those who make all associations dear. It is seldom that one individual has the power [of] giving to another such a sum of pleasure as you this day have granted me. I know not whether the conviction of being loved be more delightful or the corresponding one of loving in return. I ought, for I have experienced them both in excess. With yours I received a letter from Charlotte, talking of parsonages in pretty countries & other celestial views. I cannot fail to admire such a short sailor-like 'splicing' match. The style seems prevalent, Fanny seems to have done the business in a ride. Well it may be all very delightful to those concerned, but as I like unmarried woman better than those in the blessed state, I vote it a bore: by the fates at this pace I have no chance for the parsonage: I direct of course to you as Miss Darwin. I own I am curious to know to whom I am writing. Susan I suppose bears the honors of being Mrs J. Price. I want to write to Charlotte, & how & where to direct I don't know: it positively is an inconvenient fashion this marrying: Maer won't be half the place it was & as for Woodhouse, if Fanny was not perhaps at this time Mrs Biddulph I would say poor dear Fanny till I fell to sleep. I feel much inclined to philosophise, but I am at a loss what to think or say, whilst really melting with tenderness I cry my dearest Fanny why, I demand, should I distinctly see the sunny flower garden at Maer? on the other hand, but I find that my thoughts & feelings & sentences are in such a maze that between crying & laughing I wish you all good night.

April 5th. A merchant in this town is going to visit a large estate about 150 miles in the country. He has allowed me to accompany him. On the 8th we start & do not return for a fortnight. It is an uncommon & most excellent opportunity, and I shall thus see, what has been so long my ambition, virgin forest uncut by man & tenanted by wild beasts. You will all be terrified at the thought of my combating with alligators & Jaguars in the wilds of the Brazils: The expedition is really quite a safe one, else I will wager my life my host & companion would not venture on it. I believe a packet will sail before I return, if so this letter will go. I will of course write again from Rio. When I return I shall live in a cottage at the village of Botofogo: Earl & King will be my companions; I look forward to living there as an Elysium. The house & garden is overwhelmed by flowers & is





*The Sugar Loaf, Rio de Janeiro*

situated close to a retired lake, or rather loch as it is connected with the sea but landlocked by lofty hills. I suppose we shall be here for 5 weeks: & then to Monte Video which will be my direction for a very long time. With your nice letters I received a most kind and affectionate one from Henslow. It is not impossible I shall have occasion to draw for some money. Most certainly this is the most expensive place we shall perhaps ever again visit. My time is so very much occupied that my letters must be for the whole family. Before leaving Rio I shall send a begging letter for some books (the enjoyment of which is immense) & instruments. I have had a great deal of plague in getting my passport: a revolution is expected tomorrow which made it more difficult. I am very sleepy & hot. So my dearest Caroline & all of you good bye.

Yrs very affectionately  
Chas Darwin.

My love to everybody who cares for me. I hope I shall hear from Mr Owen (& Fanny). His so kindly talking of me I value more than almost anybody.

*Darwin and Beagle* pp.60-3

APRIL 15th. We were obliged to have a black man to clear the way with a sword; the woods in this neighbourhood contain several forms of vegetation which I had



not before seen; some species of most elegant tree ferns; a grass like the Papyrus; & the Bamboo, the circumference of the stems were 12 inches. I was rather disappointed in them, & can hardly believe they were good specimens. On arriving at the estate, there was a most violent & disagreeable quarrell between Mr Lennon & his agent, which quite prevented us from wishing to remain there. This Fazenda is the most interior piece of cleared ground, until you pass the mountains; its length is 2 & a  $\frac{1}{2}$  miles, Mr Lennon is not sure how many broad: it may be guessed what a state the country must be in when I believe every furlong of this might be cultivated. In the evening it rained very hard, I suffered from the cold, although the thermometer was  $75^{\circ}$ . During Mr Lennon's quarrell with his agent, he threatened to sell at the public auction an illegitimate mulatto child to whom Mr Cowper was much attached: also he nearly put into execution taking all the women & children from their husbands & selling them separately at the market at Rio. Can two more horrible & flagrant instances be imagined? & yet I will pledge myself that in humanity & good feeling Mr Lennon is above the common run of men. How strange & inexplicable is the effect of habit & interest. Against such facts how weak are the arguments of those who maintain that slavery is a tolerable evil!

16th. Started early in the morning to Senhor Manuel at Socêgo, whom it was agreed upon should be arbitrator. Again I enjoyed the never failing delight of riding through the forests.

17th & 18th. These two days were spent at Socêgo, & was the most enjoyable part of the whole expedition; the greater part of them was spent in the woods, & I succeeded in collecting many insects & reptiles. The woods are so thick & matted that I found it quite impossible to leave the path. The greater number of trees, although so lofty, are not more than from 3 to 4 feet in circumference. These are interspersed with others of a much greater size. Senhor Manuel was making a canoe 70 feet long, & on the ground was left 40 more feet, so that there was 110 feet of straight solid trunk. The contrast of the Palms amongst other trees never fails to give the scene a most truly tropical appearance: the forests here are ornamented by one of the most elegant, the Cabbage Palm; with a stem so narrow, that with the two hands it may be clasped, it waves its most elegant head from 30 to 50 feet above the ground. The soft part, from which the leaves spring, affords a most excellent vegetable. The woody creepers, themselves covered by creepers, are of great thickness, varying from 1 to nearly 2 feet in circumference. Many of the older trees present a most curious spectacle, being covered with tresses of a liana, which much resembles bundles of hay. If the eye is turned from the world of foliage above, to the ground, it is attracted by the extreme elegance of the leaves of numberless species of ferns & mimosas. Thus it is easy to specify individual objects of admiration; but it is nearly impossible to give an adequate idea of the higher feelings which are excited; wonder, astonishment & sublime devotion, fill & elevate the mind.





*Botofogo Bay, Rio de Janeiro*

Darwin returned to the cottage on Botofogo Bay that he shared with the artist Augustus Earle.

C.D. TO MISS CAROLINE DARWIN

Botofogo Bay. April 25th

My dear Caroline,

I had sealed up the first letter all ready to be sent off during my absence: but no good opportunity occurred so it & this will go together. I take the opportunity of Maccormick returning to England, being invalided, i.e. being disagreeable to the Captain & Wickham. He is no loss. Derbyshire is also discharged the service from his own desire, not choosing his conduct, which has been bad about money matters, to be investigated. All this has been a long parenthesis.

My expedition lasted 15 days, most of which were ones of uncommon fatigue; I suppose for a civilised country travelling could not be worse – the greatest difficulty in getting anything to eat & not undressing for the five first days. I was very unwell for two days & the misery of riding in a scorching sun for about 10 hours was extreme. My horror of being left utterly destitute in a Venda will be better than any schoolmaster to make me learn Spanish as soon as we get into those countries. On the other side, there was a great interest & novelty in seeing the manner of living amongst the Brazilians, which [I] have [had the] opportunity



of doing during a few days in which I resided at a Fazenda, that is one of the most interior cleared estates. Their habits of life were quite patriarchal. Forest & flowers & birds I saw in great perfection & the pleasure of beholding them is infinite. I advise you to get a French engraving, *Le Foret du Bresil*: it is most true & clever. This letter will be odds and ends as really I have scarcely time for writing. I send in a packet my commonplace Journal. I have taken a fit of disgust with it & want to get it out of my sight. Any of you that like, may read it. A great deal is absolutely childish: Remember however this, that it is written solely to make me remember this voyage & that it is not a record of facts but of my thoughts – and in excuse recollect how tired I generally am when writing it.

Earl & myself are now living in this most retired & beautiful spot. I trust to spend a most delightful fortnight. I have begun however with a bad omen. Whilst landing, the boat was swamped & a heavy sea knocked me head over heels & filled the boat. I never shall forget my agony seeing all my useful books, papers, instruments, microscopes &c &c, gun, rifle, all floating in the Salt Water: every thing is a little injured but not much: I must harden myself to many such calamities. It is very lucky I have such nice lodgings as the ship is turned inside out. A large party of the officers have gone up the river in the cutter. I came just too late for this cruise. I believe King is coming to live here, he is the most perfect pleasant boy I ever met with & is my chief companion. Wickham is a fine fellow – and we are very good friends – which in a selfish way is no common advantage.

And now for the Captain, as I daresay you feel some interest in him. As far as I can judge, he is a very extraordinary person. I never before came across a man whom I could fancy being a Napoleon or a Nelson. I should not call him clever, yet I feel convinced nothing is too great or too high for him. His ascendancy over everybody is quite curious: the extent to which every officer & man feels the slightest rebuke or praise would have been, before seeing him, incomprehensible. It is very amusing to see all hands hauling at a rope, they not supposing him on deck & then observe the effect when he utters a syllable: it is like a string of dray horses when the waggoner gives one of his awful smacks. His candor & sincerity are to me unparralleled: & using his own words his 'vanity & petulance' are nearly so. I have felt the effects of the latter: but then bringing into play the former ones so forcibly makes one hardly regret them. His greatest fault as a companion is his austere silence, produced from excessive thinking: his many good qualities are great & numerous: altogether he is the strongest marked character I ever fell in with.

Be sure you mention the receiving of my journal, as anyhow to me it will [be] of considerable future interest as it [is] an exact record of all my first impressions & such a set of vivid ones they have been must make this period of my life always one of interest to myself. If you will speak quite sincerely, I should be glad to have your criticisms, only recollect the above mentioned apologies.

I like this sort of life very much: I can laugh at the miseries of even Brazilian travelling. I must except one morning when I did not get my breakfast till one o'clock having ridden many miles over glaring sand. Generally one is obliged to wait two hours before you can get anything to eat, be the time what it may.



Although I like this knocking about, I find I steadily have a distant prospect of a very quiet parsonage & I can see it even through a grove of Palms.

Friday. The Captain has just paid us a visit & taken me to the Ministers, where I dine on Monday & meet the very few gentlemen there are in the place. He has communicated to me an important piece of news: the Beagle on the 7th of May sails back to Bahia. The reason is a most unexpected difference is found in the Longitudes. It is a thing of great importance & the Captain has written to the Admiralty accordingly. Most likely I shall live quietly here, it will cost a little but I am quite delighted at the thought of enjoying a little more of the Tropics. I am sorry the first part of this letter has already been sent to the Tyne; I must tell you for your instruction that the Captain says, Miss Austens novels are on everybody[']s table, which solely means the Jerseys, Londonderrys &c.

You shall hear from me again from Rio, how I wish I could do the same from you. Remember me most affectionately to every body, & to my Father, Susan & Catherine, & Erasmus. The latter must not forget to write to me. I would write to each of you, only it is in reality useless.

April 26th  
Rio de Janeiro

Good bye & good night to all of you,  
Yours ever affectionately,  
Charles Darwin

*Darwin and Beagle* pp.64-6

MAY 5th & 6th. These days have quietly glided away; there have been torrents of rain, & the fields are quite soaked with water; if I had wished to walk it would have been very disagreeable, but as it is, I find one hour's collecting keeps me in full employment for the rest of the day. The naturalist in England, in his walks, enjoys a great advantage over others in frequently meeting with something worthy of attention; here he suffers a pleasant nuisance in not being able to walk a hundred yards without being fairly tied to the spot by some new & wondrous creature.

7th. Went on board & spent the day there; in the evening brought with me a few things which I wanted before the departure of the Beagle.

8th. Torrents of rain. I am at present chiefly collecting spiders. In the course of a few hours .26 [inches] rain fell.

9th. Went out collecting & took the direction of the Botanic Garden; I soon came to one of the salt water lakes or bays, by which the surrounding country is often penetrated. Many of the views were exceedingly beautiful; yet in tropical scenery, the entire newness, & therefore absence of all associations, which in my own case (& I believe in others) are unconsciously much more frequent than I ever thought, requires the mind to be wrought to a high pitch, & then assuredly no delight can be greater; otherwise your reason tells you it is beautiful but the feelings do not correspond. I often ask myself, why can I not calmly enjoy this; I might answer myself by also asking, what is there that can bring the delightful ideas of rural quiet & retirement, what that can call back the recollection of childhood & times past, where all that was unpleasant is forgotten; untill ideas, in their effects similar to them, are raised, in vain may we look amidst the glories of



this almost new world for quiet contemplation.

The Captain called in the evening & says the *Beagle* sails tomorrow. We also today heard the bad news that three of the party, who went up in the Cutter to Macucù for snipe shooting, are taken seriously ill with Fevers. There is reason to fear that others were beginning to feel the bad effects of their excursion. The first case occurred 4 days after the arrival of the party on board on the 2nd. A boat from the *Warspite* started yesterday for the same purpose. I very nearly succeeded in joining it; my good star presided over me when I failed. Four of us belonging to the *Beagle* are now living here. Earl, who is unwell & suffers agonies from the Rheumatism. The serjeant of Marines, who is recovering from a long illness, & Miss Fuegia Basket, who daily increases in every direction except height.

*Diary* pp. 59-60

On May 10th the *Beagle* set sail for Bahia once more, in order to investigate a discrepancy between her observations and the French chart. It turned out that although the relative positions of Bahia and the Abrolhos Islands were shown correctly on the chart, there was an error of four miles in longitude between the Islands and Rio de Janeiro.

On this passage one of our seamen died of a fever, contracted when absent from the *Beagle* with several of her officers, on an excursion to the interior part of the extensive harbour of Rio de Janeiro. One of the ship's boys, who was in the same party, lay dangerously ill, and young Musters seemed destined to be another victim to this deadly fever.

It was while the interior of the *Beagle* was being painted, and no duty going on except at the little observatory on Villegagnon Island, that those officers who could be spared made this excursion to various parts of the harbour. Among other places they were in the river Macacu, and passed a night there. No effect was visible at the time; the party returned in apparent health, and in high spirits; but two days had not elapsed when the seaman, named Morgan, complained of headach and fever.

The boy Jones and Mr Musters were taken ill, soon afterwards, in a similar manner; but no serious consequences were then apprehended, and it was thought that a change of air would restore them to health. Vain idea! they gradually became worse; the boy died the day after our arrival in Bahia; and, on the 19th of May, my poor little friend Charles Musters, who had been entrusted by his father to my care, and was a favourite with every one, ended his short career.

My chief object in now mentioning these melancholy facts is to warn the few who are not more experienced than I was at that time, how very dangerous the vicinity of rivers may be in hot climates. Upon making more inquiry respecting those streams which run into the great basin of Rio de Janeiro, I found that the Macacu was notorious among the natives as being often the site of pestilential malaria, fatal even to themselves. How the rest of our party escaped, I know not; for they were eleven or twelve in number, and occupied a day and night in the river. When they left the ship it was not intended that they should go up any river; the object of their excursion being to visit some of the beautiful islets which stud



the harbour. None of us were aware, however, that there was so dangerous a place as the fatal Macacu within reach. I questioned every one of the party, especially the second lieutenant and master, as to what the three who perished had done different from the rest; and discovered that it was believed they had bathed during the heat of the day, against positive orders, and unseen by their companions; and that Morgan had slept in the open air, outside the tent, the night they passed on the bank of the Macacu.

As far as I am aware, the risk, in cases such as these, is chiefly encountered by sleeping on shore, exposed to the air on or near the low banks of rivers, in woody or marshy places subject to great solar heat. Those who sleep in boats, or under tents, suffer less than persons sleeping on shore and exposed; but they are not always exempt, as the murderous mortalities on the coast of Africa prove. Whether the cause of disease is a vapour, or gas, formed at night in such situations, or only a check to perspiration when the body is peculiarly affected by the heat of the climate, are questions not easy to answer, if I may judge from the difficulty I have found in obtaining any satisfactory information on the subject. One or two remarks may be made here, perhaps. The danger appears to be incurred while sleeping; or when over-heated; not while awake and moderately cool; therefore we may infer that a check to the perspiration which takes place at those times is to be guarded against, rather than the breathing of any peculiar gas, or air, rising from the rivers or hanging over the land, which might have as much effect upon a person awake, as upon a sleeper. Also, to prevent being chilled by night damp, and cold, as well as to purify the air, if vapour or gas should indeed be the cause of fever, it is advisable to keep a large fire burning while the sun is below the horizon. But the subject of malaria has been so fully discussed by medical men, that even this short digression is unnecessary.

*Narrative* 2 pp. 76-7

Darwin remained in Rio, and occupied himself in writing his first letter to his mentor in Cambridge, and another to his sister.

C.D. TO PROFESSOR HENSLOW

Rio de Janeiro. May 18th 1832

My dear Henslow.

I have delayed writing to you till this period as I was determined to have a fair trial of the voyage. I have so many things to write about, that my head is as full of oddly assorted ideas, as a bottle on the table is with animals. You being my chief Lord of the Admiralty, must excuse this letter being full of my's & I's.

After our two attempts to put to sea in spite of the SWly gales, the time at Plymouth passed away very unpleasantly. I would have written, only I had nothing to say, excepting what had better be left unsaid: so that I only wrote to Shrewsbury. At length we started from Plymouth on the 27th of December with a prosperous wind which has lasted during our whole voyage. The two little peeps at sea-sick misery gave me but a faint idea of what I was going to undergo. Till arriving at Teneriffe (we did not touch at Madeira) I was scarcely out of my





*The Corcovado, Rio de Janeiro*

hammock & really suffered more than you could well imagine from such a cause. At Santa Cruz, whilst looking amongst the clouds for the Peak & repeating to myself Humboldt's sublime descriptions, it was announced we must perform 12 days strict quarantine. We had made a short passage, so 'Up Jib' & away for St Jago.

You will say all this sounds very bad, & so it was: but from that to the present time it has been nearly one scene of continual enjoyment. A net over the stern kept me at full work, till we arrived at St Jago: here we spent three most delightful weeks. The geology was preeminently interesting & I believe quite new: there are some facts on a large scale of upraised coast (which is an excellent epoch for all the Volcanic rocks to date from) that would interest Mr Lyell. One great source of perplexity to me is an utter ignorance whether I note the right facts & whether they are of sufficient importance to interest others. In the one thing collecting, I cannot go wrong. St Jago is singularly barren & produces few plants or insects — so that my hammer was my usual companion & in its company most delightful hours I spent. On the coast I collected many marine animals chiefly gasteropodous (I think some new). I examined pretty accurately a Caryophyllea & if my eyes were not bewitched former descriptions have not the slightest resemblance to the animal. I took several specimens of an Octopus which possessed a most marvellous power of changing its colours: equalling any chamaelion, & evidently



accommodating the changes to the colour of the ground which it passed over – yellowish green, dark brown & red were the prevailing colours: this fact appears to be new, as far as I can find out. Geology & the invertebrate animals will be my chief object of pursuit through the whole voyage.

We then sailed for Bahia, & touched at the rock of St Paul. This is a Serpentine formation. Is it not the only island in the Atlantic which is not *Volcanic*? We likewise staid a few hours at Fernando Noronha; a tremendous surf was running, so that a boat was swamped, & the Captain would not wait. I find my life on board, when we are in blue water most delightful; so very comfortable & quiet: it is almost impossible to be idle, & that for me is saying a good deal. Nobody could possibly be better fitted out in every respect for collecting than I am: many cooks have not spoiled the broth this time; Mr Browne's little hint about microscopes etc have been invaluable. I am well off in books; the Dic. Class: is *most useful*. If you should think of any thing or book that would be useful to me: if you would write one line E. Darwin Whyndham Club St James St. He will procure them & send them with some other things to *Monte Video*, which for the next year will be my head quarters.

Touching at the Abrolhos we arrived here on April 4th, when amongst others I received your most kind letter: you may rely on it, during the evening, I thought of the many most happy hours I have spent with you in Cambridge. I am now living at Botofogo, a village about a league from the city, & shall be able to remain a month longer. The Beagle has gone back to Bahia, & will pick me up on its return. There is a most important error in the longitude of S America, to settle which this second trip has been undertaken. Our Chronometers at least 16 of them, are going superbly: none on record ever have gone at all like them.

A few days after arriving I started on an expedition of 150 miles to Rio Macaò, which lasted 18 days. Here I first saw a Tropical forest in all its sublime grandeur. Nothing but the reality can give any idea, how wonderful, how magnificent, the scene is. If I was to specify any one thing I should give the preeminence to the host of parasitical plants. Your engraving is exactly true, but underates, rather than exaggerates the luxuriance. I never experienced such intense delight. I formerly admired Humboldt, I now almost adore him; he alone gives any notion, of the feelings which are raised in the mind on first entering the Tropics. I am now collecting fresh-water & land animals: if what was told me in London is true viz that there are no small insects in the collections from the Tropics – I tell Entomologists to look out & have their pens ready for describing. I have taken as minute (if not more so) as in England, Hydropori, Hygroti, Hydrobii, Pselaphi, Staphylini, Curculio, Bembididous insects etc etc. It is exceedingly interesting observing the difference of genera & species from those which I know; it is however much less than I had expected. I am at present red-hot with Spiders; they are very interesting, & if I am not mistaken I have already taken some new genera. I shall have a large box to send very soon to Cambridge, & with that I will mention some more Natural History particulars.

The Captain does everything in his power to assist me, & we get on very well – but I thank my better fortune he has not made me a renegade to Whig principles: I



would not be a Tory, if it was merely on account of their cold hearts about that scandal to Christian Nations, Slavery. I am very good friends with all the officers; & as for the Doctor he has gone back to England – as he chose to make himself disagreeable to the Captain & to Wickham. He was a philosopher of rather an antient date; at St Jago by his own account he made *general* remarks during the first fortnight & collected particular facts during the last.

I have just returned from a walk, & as a specimen how little the insects are know[n], *Noterus*, according to Dic. Class. contains solely 3 European species; I, in one haul of my net took five distinct species – is this not quite extraordinary?

June 16th – I have determined not to send a box till we arrive at Monte Video – it is too great a loss of time both for Carpenters & myself to pack up whilst in harbor. I am afraid when I do send it, you will be disappointed, not having skins of birds & but very few plants, & geological specimens small: the rest of the things in bulk make very little show. I received a letter from Herbert, stating that you have a vol. of Dic. Class. Will you send it to Whyndham Club. I suppose you are at this moment in some seaport with your pupils. I hope for their & your sake, that there will be but few rainy mathematical days. How I should enjoy one week with you: quite as much as you would one in the glorious Tropics.

We sail for Monte Video at the end of this month (June) so that I shall have been here nearly 3 months. This has been very lucky for me, as it will be some considerable period before we again cross the Tropics. I am sometimes afraid I shall never be able to hold out for the whole voyage. I believe 5 years is the shortest period it will consume. The mind requires a little case-hardening, before it can calmly look at such an interval of separation from all friends. Remember me most kindly to Mrs Henslow & the two Signoritas; also to L. Jenyns, Mr Dawes & Mr Peacock. Tell Prof. Sedgwick he does not know how much I am indebted to him for the Welch expedition – it has given me an interest in geology which I would not give up for any consideration. I do not think I ever spent a more delightful three weeks, than in pounding the NW mountains. I look forward to the Geology about M. Video – as I hear there are slate [formations?] there. So I presume in that district I shall find the junction of the Pampas of the enormous granite formation of Brazils. At Bahia the Pegmatite & gneiss in beds had same direction as observed by Humboldt prevailing over Columbia, distant 1300 miles: is it not wonderful? M. Video will be for long time my direction: I hope you will write again to me – there is nobody, from whom I like receiving advice so much as from you. I shall be much obliged if you will get one of the engravings of poor Mr Ramsay & keep it for me. Excuse this almost unintelligible letter & believe me dear Henslow – with the warmest feelings of respect & friendship

Yours affectionately  
Chas Darwin

June 16th

P.S. I found the other day a beautiful *Hymenophallus* (but broke it to pieces in bringing home) & with an accompanying *Leiodes* – a most perfect copy of the Barmouth specimen.

*Darwin & Henslow* pp. 52–7



C.D. TO MISS CATHERINE DARWIN

May-June. Botofogo Bay, Rio de Janeiro

My dear Catherine,

I have now altogether received three letters; yours & Carolines together, which latter I have answered & also sent my Journal by the Tyne, which was returning to England. Susans (& one from Mr Owen) I received May 3d. The Beagle has not yet returned; so I am living quietly here & thoroughly enjoying so rare an opportunity of seeing the country & collecting in every branch of Nat. History. I have just been rereading all your nice affectionate letters, & in consequence I have summoned resolution to begin a letter. I am so wearied of writing letters & telling the same story; that if I stumble through this, it is almost more than I expect. I have sent a list of commissions for poor Erasmus to execute, directed to Whyndam club. Tell my Father I am afraid some of them are expensive, but he cannot imagine the value such things are in a country where even a watch never yet has been manufactured. I am very glad to hear the hothouse is going on well; how when I return I shall enjoy seeing some of my old friends again – do get a Banana plant, they are easily reared & the foliage is wonderfully beautiful. I have not yet ceased marvelling at all the marriages: as for Maer & Woodhouse, they might as well be shut up. I received a very kind letter from Mr Owen & Fanny. The former contained the warmest expressions of friendship to my Father. (This letter will be odds & ends.) I suppose by this time you see how uncertain ship-letters must always be. When we get to the South & have a 5 month cruize without seeing an homeward bound sail, together with the chances both before & after, the time might be almost indefinite between two of my letters. The Admirals secretary here was under Cap. Maling; who seems to have had a great deal of duty at a very precarious time: the secretary says that Mrs Maling entirely managed the political part.

June 6th – The Beagle has returned from Bahia & brought most calamitous news – a large party of our officers & 2 sailors before leaving Rio went a party in the Cutter for snipe shooting up the bay. Most of them were slightly attacked with fever, but the two men & poor little Musters were seized violently & died in a few days. The latter & one man were buried at Bahia. The poor little fellow only two days before his illness heard of his mother's death. What numbers snipe-shooting has killed, & how rapidly they drop off. The Beagle will stay another 14 days at least & then we sail for Monte Video, touching I hope at St Catherines. She is getting in beautiful order; increased our compliment; got a new gun; put up boarding nettings, & rigged sweeps – & now there is not a pirate afloat whom we care for, & a thousand savages together would be harmless.

I have written letters to Charlotte, Mr Owen, Fox, & Henslow & Herbert; I mention it, being always anxious, when it is possible, to know whether my letters have arrived safely. I received a nice long one from Caroline, dated Maer – & directed to Mr Darwin, H.M.S. Am I a ship? or is His Majesty's Ship Beagle a dog? that you stick a *the* before it. One would suppose she did not know the Jib boom from the Taffrill – to see her direct in such a manner (odds & ends as I before said). Capt. Harding, brother of Mrs Hunt, second Capt. of the Warspite, is



here & is very civil to me. He sent to me to say he had 800 men under his command, & that I might have a boat for an hour or week as I choose. One of our officers lives at Falmouth, he gives the following direction for letters. There are two packets sail every month, one for Rio & the other touching at Rio proceeds to M Video. This one sails the Friday after the 3d Tuesday in the month, & is of course the best way of sending my monthly letter. The letter ought to be in a day before the Friday. Whenever you should [be] in doubt about direction, put South American Station. Till I tell you, stick to Monte Video.

You cannot imagine anything more calmly & delightfully than these weeks have passed by – there never was a greater piece of good luck than the Beagle returning to Bahia. Give my best love to Marianne & thank her for her postscript; & tell her to remember me most kindly to Dr Parker. Remember me to all friends, especially Major Bagley & the Eytons – tell Tom to keep his courage up, for the Canaries or Madeira would be very feasible. I drew 40£ (mentioned in my last letter) & I am afraid I shall be forced to draw 10£ more. I really am very sorry, but 12 weeks here instead of 4 has been a great increase. My lodgings & board only cost 22 shillings per week.

I am ashamed to send so uninteresting a letter; but it will be to you unintelligible how difficult I find writing letters. At [the] latter end of this month (June) we sail for M. Video. Our first course will be I believe down the coast to Rio Negro, where there is a small settlement of Spaniards. Our next will be to where Man has never yet been (that is as far as is known). How glad I am the Beagle does not carry a years provisions; formerly it was like going into the grave for that time. Living with the Captain is a great advantage in having what society there is at my command – I am [the] only one in the ship who is regularly asked to the Admiral's, Chargé d'Affaire's, & other great Men.

with my very best love to every one, dear Katty,

Yours most affectionately,

Chas Darwin

[added in another hand]

Captn Beaufort presents his compliments to Miss Darwin with the enclosed letter, and perhaps she will pardon the liberty he takes in adding that Capt Fitzroy omits no opportunity of expressing the unqualified satisfaction he feels in Mr Darwin's society – and in his last dispatch he says 'D. is equally liked and respected by every person in the ship'.

Admiralty June 29/32

*Darwin and Beagle* pp.67–9

JUNE 9th. Started at half after six with Derbyshire for a very long walk to the Gavia. This mountain stands near the sea, & is recognised at a great distance by its most singular form. Like the generality of the hills, it is a precipitous rounded cone, but on the summit is a flat angular mass, whence it takes the name of 'table' or *topsail* mountain. The narrow path wound round its Southern base; the morning was delightful; & the air most fragrant & cool. I have no where seen such liliaceous plants & those with large leaves in such luxuriant plenty; growing



1832 RIO DE JANEIRO

on the border of the clear shaded rivulets & as yet glittering with drops of dew, they invited the traveller to rest. The ocean, blue from the reflected sky, was seen in glimpses through the forest. Islands crowned with palms varied our horizon. As we passed along, we were amused by watching the humming-birds. I counted four species – the smallest at but a short distance precisely resembles in its habits & appearance a sphinx. The wings moved so rapidly, that they were scarcely visible, & so remaining stationary the little bird darted its beak into the wild flowers; making an extraordinary buzzing noise at the same time, with its wings. Those that I have met with, frequent shaded & retired forests & may there be seen chasing away the rival butterfly. In vain we attempted to find any path to ascend the Gavia; this steep hill subtends to the coast at an angle of  $42^{\circ}$ . We returned home; at our furthest point we had a good view of the coast for many miles. It was skirted by a band of thick brushwood behind which was a wide plane of marshes & lakes; which in places were so green, they they looked like meadows.

*Diary* pp.69–70

JUNE 18th. King came & spent the day with me; we both on horseback started for the old forest. He shot some birds & as is generally the case I found many interesting animals of the lower classes. We found a little Palm tree, only a few inches in circumference, which I believe to be 305 years old. I judge of this from its number of rings, each of which I imagine marks a year. On the road home I overtook my old friend the Padre, returning with his dogs from the Gavia. He presented to me a magnificent specimen of the little once [ounce], which after five hours hunting, he had succeeded in shooting.

*Diary* p.72

JUNE 27th. This is my last day on shore; so I was determined it should not be an idle one. In the bay I found some fine Corallines; the examination of which occupied me during the whole day. Upon the whole I am tolerably contented with what I have done at Rio in Natural History; several important branches have been cut off: Geology is uninteresting, Botany & Ornithology too well known; & the sea totally unproductive excepting in one place in Botofogo Bay; so that I have been reduced to the lower classes, which inhabit the dry land or fresh water. The number of species of Spiders which I have taken is something enormous. The time during these eleven weeks has passed so delightfully, that my feelings on leaving Botofogo are full of regret & gratitude.

*Diary* p.74

Darwin summarizes some of his observations on the natural history of Brazil.

At these times the fireflies are seen flitting about from hedge to hedge. All that I caught belonged to the family of Lampyridae, or glowworms, and the greater number were *Lampyris occidentalis*. I found that this insect emitted the most brilliant flashes when irritated: in the intervals the abdominal rings were



obscured. The flash was almost co-instantaneous in the two rings, but it was first just perceptible in the anterior one. The shining matter was fluid and very adhesive: little spots, where the skin had been torn, continued bright with a slight scintillation, whilst the uninjured parts were obscured. When the insect was decapitated the rings remained uninterruptedly bright, but not so brilliant as before: local irritation with a needle always increased the vividness of the light. The rings in one instance retained their luminous property nearly twenty-four hours after the death of the insect. From these facts it would appear probable, that the animal has only the power of concealing or extinguishing the light for short intervals, and that at other times the display is involuntary. On the muddy and wet gravel-walks I found the larvae of this lampyris in great numbers: they resembled in general form the female of the English glowworm. These larvae possessed but feeble luminous powers; very differently from their parents, on the slightest touch they feigned death, and ceased to shine; nor did irritation excite any fresh display. I kept several of them alive for some time: their tails are very singular organs, for they act, by a well-fitted contrivance, as suckers, or organs of attachment, and likewise as reservoirs for saliva, or some such fluid. I repeatedly fed them on raw meat; and I invariably observed, that every now and then the extremity of the tail was applied to the mouth, and a drop of fluid exuded on the meat, which was then in the act of being consumed. The tail, notwithstanding so much practice, does not seem to be able to find its way to the mouth; at least the neck was always touched first, and apparently as a guide.

When we were at Bahia, an elater (*Pyrophorus luminosus*, Illig.) seemed the most common luminous insect. The light in this case was also rendered more brilliant by irritation. I amused myself one day by observing the springing powers of this insect, which have not, as it appears to me, been properly described. The elater, when placed on its back and preparing to spring, moved its head and thorax backwards, so that the pectoral spine was drawn out, and rested on the edge of its sheath. The same backward movement being continued, the spine, by the full action of the muscles, was bent like a spring; and the insect at this moment rested on the extremity of its head and elytra. The effort being suddenly relaxed, the head and thorax flew up, and, in consequence, the base of the elytra struck the supporting surface with such force, that the insect by the reaction was jerked upwards to the height of one or two inches. The projecting points of the thorax, and the sheath of the spine, served to steady the whole body during the spring. In the descriptions which I have read, sufficient stress does not appear to have been laid on the elasticity of the spine: so sudden a spring could not be the result of simple muscular contraction, without the aid of some mechanical contrivance.

On several occasions I enjoyed some short but most pleasant excursions in the neighbouring country. One day I went to the Botanic Garden, where many plants, well known for their great utility, might be seen growing. The leaves of the camphor, pepper, cinnamon, and clove trees were delightfully aromatick; and the bread fruit, the jack, and the mango, vied with each other in the magnificence of their foliage. The landscape in the neighbourhood of Bahia almost takes its character from the two latter trees. Before seeing them, I had no idea that any trees



could cast so black a shade on the ground. Both of them bear to the ever green vegetation of these climates, the same kind of relation which laurels and hollies in England do to the lighter green of the deciduous trees. It may be observed, that the houses within the tropics are surrounded by the most beautiful forms of vegetation, because many of them are at the same time most useful to man. Who can doubt that these qualities are united in the banana, the cocoa-nut, the many kinds of palm, the orange, and the bread-fruit tree?

During this day I was particularly struck with a remark of Humboldt's, who often alludes to 'the thin vapour which, without changing the transparency of the air, renders its tints more harmonious, softens its effects', &c. This is an appearance which I have never observed in the temperate zones. The atmosphere, seen through a short space of half or three-quarters of a mile, was perfectly lucid, but at a greater distance all colours were blended into a most beautiful haze, of a pale French gray, mingled with a little blue. The condition of the atmosphere between the morning and about noon, when the effect was most evident, had undergone little change, excepting in its dryness. In the interval, the difference between the dew point and temperature had increased from  $7^{\circ}.5$  to  $17^{\circ}$ .

On another occasion I started early and walked to the Gavia, or topsail mountain. The air was delightfully cool and fragrant; and the drops of dew still glittered on the leaves of the large liliaceous plants, which shaded the streamlets of clear water. Sitting down on a block of granite, it was delightful to watch the various insects and birds as they flew past. The humming-birds seem particularly fond of such shady retired spots. Whenever I saw these little creatures buzzing round a flower, with their wings vibrating so rapidly as to be scarcely visible, I was reminded of the sphinx moths: their movements and habits are indeed, in many respects, very similar.

Following a pathway I entered a noble forest, and from a height of five or six hundred feet, one of those splendid views was presented, which are so common on every side of Rio. At this elevation the landscape has attained its most brilliant tint; and every form, every shade, so completely surpasses in magnificence all that the European has ever beheld in his own country, that he knows not how to express his feelings. The general effect frequently recalled to my mind the gayest scenery of the Opera-house or the great theatres. I never returned from these excursions empty-handed. This day I found a specimen of a curious fungus, called *Hymenophallus*. Most people know the English *Phallus*, which in autumn taints the air with its odious smell: this, however, as the entomologist is aware, is to some of our beetles a delightful fragrance. So was it here; for a *Strongylus*, attracted by the odour, alighted on the fungus as I carried it in my hand. We here see in two distant countries a similar relation between plants and insects of the same families, though the species of both are different. When man is the agent in introducing into a country a new species, this relation is often broken: as one instance of this I may mention, that the leaves of the cabbages and lettuces, which in England afford food to such a multitude of slugs and caterpillars, in the gardens near Rio are untouched.

During our stay in Brazil I made a large collection of insects. A few general



observations on the comparative importance of the different orders, may be interesting to the English entomologist. The large and brilliantly-coloured Lepidoptera bespeak the zone they inhabit, far more plainly than any other race of animals. I allude only to the butterflies; for the moths, contrary to what might have been expected from the rankness of the vegetation, certainly appeared in much fewer numbers than in our own temperate regions. I was much surprised at the habits of *Papilio feronia*. This butterfly is not uncommon, and generally frequents the orange-groves. Although a high flier, yet it very frequently alights on the trunks of trees. On these occasions its head is invariably placed downwards; and its wings are expanded in a horizontal plane, instead of being folded vertically, as is commonly the case. This is the only butterfly which I have ever seen that uses its legs for running. Not being aware of this fact, the insect, more than once, as I cautiously approached with my forceps, shuffled on one side just as the instrument was on the point of closing, and thus escaped. But a far more singular fact, is the power which this species possesses of making a noise. Several times when a pair, probably male and female, were chasing each other in an irregular course, they passed within a few yards of me; and I distinctly heard a clicking noise, similar to that produced by a toothed wheel passing under a spring catch. The noise was continued at short intervals, and could be distinguished at about twenty yards distance. I cannot form a conjecture how it is produced; but I am certain there is no error in the observation.

*Narrative* 3 pp. 34-7

C.D. TO MISS CATHERINE DARWIN

Rio de Janeiro, HMS Beagle. July 5th

My dear Catherine

I have only  $\frac{1}{4}$  of an hour to write this – Sullivan will put it in his parcel, so that it will only cost common postage. I have received your letter directed Monte Video & previous to it one from Caroline from Maer. Tomorrow we sail for Mon: Video. If the wind is not directly against us, we shall touch at Cape Frio, the celebrated scene of diving for the Thetis wreck. They have fished up 900 000 dollars. If we are lucky enough (& it is very probable) to have a gale off St Catherine's we shall run in there. I expect to suffer terribly from sea-sickness – as we are certain to have bad weather. After lying a short time at MV: we cruize to the South – but not I believe below Rio Negro. The geography of this country is as little known as interior of Africa. I long to put my foot, where man has never trod before – and am most impatient to leave civilized ports.

We are all very anxious about reform; the last news brought intelligence that Lord Grey would perhaps re-continue in. Would [you] ask Erasmus to add to the books – Tennants quadrupeds (if not too late) in my bedroom, & Humboldt tableaux de la nature. You cannot imagine what a miser-like value is attached to books, when incapable of procuring them. We have been 3 months here: & most undoubtedly I well know the glories of a Brazilian forest. Commonly I ride some few miles, quit my horse & start by some track into the impenetrable mass of vegetation. Whilst seated on a tree & eating my luncheon in the sublime solitude



of the forest the pleasure I experience is unspeakable. The number of undescribed animals I have taken is very great – & some to Naturalists, I am sure, very interesting. I attempt class after class of animals, so that before very long I shall have notion of all – so that if I gain no other end I shall never want an object of employment & amusement for the rest of my life. (Sullivan only gives me 5 minutes more.) I am now writing in my own snug corner – & am as comfortable as man can be. I am only obeying orders in thus writing a short letter. When on the desert coasts of Patagonia, you will be a long time before hearing from me. My journal is going on better; but I find it inconvenient having sent the first part home on account of the dates. Give my very best love to my Father & all others.

Most affection[ately]

Ch Darwin

*Darwin and Beagle* pp.69–70

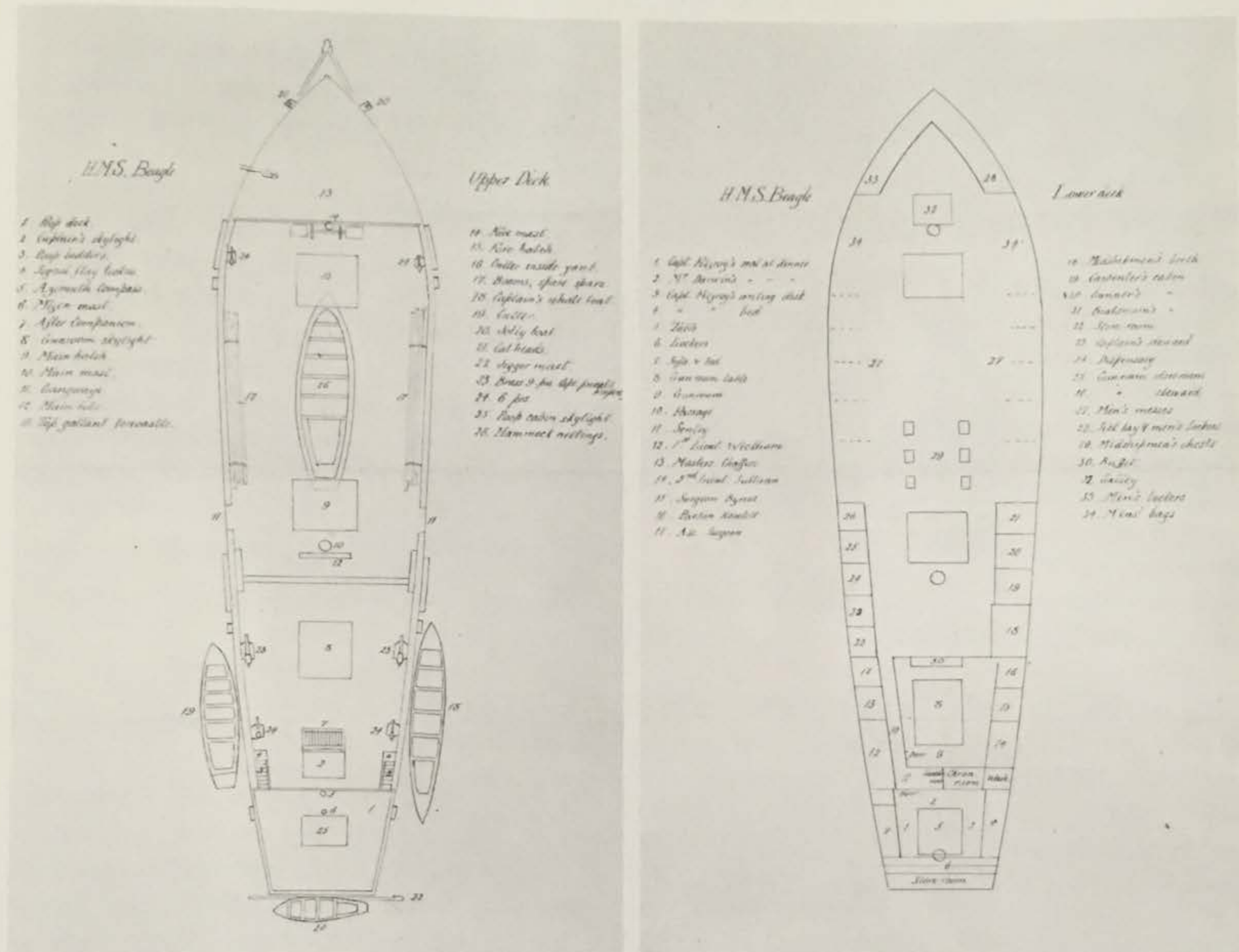
Her work in Brazil completed, the *Beagle* sailed south again.

On the 5th of July we sailed from Rio de Janeiro, honoured by a salute, not of guns, but of hearty cheers from H.M.S. Warspite. Strict etiquette might have been offended at such a compliment to a little ten-gun brig, or, indeed, to any vessel unless she were going out to meet an enemy, or were returning into port victorious: but although not about to encounter a foe, our lonely vessel was going to undertake a task laborious, and often dangerous, to the zealous execution of which the encouragement of our brother-seamen was no trifling inducement.

While in harbour, a few alterations had been made in the disposition of our guns and stores, as well as some slight changes in the sails and rigging; and as the *Beagle's* equipment afterwards remained unaltered, I will here briefly describe it. She was rigged as a bark; her masts were strongly supported by squarer cross-trees and tops, and by larger rigging than usual in vessels of her tonnage. Chains were used where found to answer, and in no place was a block or a sheave allowed which did not admit the proper rope or chain freely. There were large trysails between the masts, made of stout canvas, with several reefs, and very useful we found them. On the forecastle was a six-pound boat-carronade: before the chestree were two brass six-pound guns: close to the bulwark on each side of the waist were the 'booms'; and amidships two boats, on the diagonal principle, one stowed inside the other, and as close to the deck as possible; being secured by iron cranks, or supports. Aft the main-mast were four brass guns, two nine-pound, and two six-pound: the skylights were large; there was no capstan; over the wheel the poop-deck projected, and under it were cabins, extremely small, certainly, though filled in inverse proportion to their size. Below the upper deck her accommodations were similar to, though rather better than those of vessels of her class. Over the quarter-deck, upon skids, two whale-boats, eight-and-twenty feet long, were carried; upon each quarter was a whale-boat twenty-five feet in length, and astern was a dinghy.

*Narrative* 2 pp.81–2





*Lay-out of the decks of the 'Beagle'*

JULY 7th, Sunday 8th & 9th. The weather has been most provoking; light variable breezes, a long swell, & I very sick & miserable. This second attack of sea sickness has not brought quite so much wretchedness as the former one. But yet what it wants in degree is made up by the indignation which is felt at finding all one's efforts to do anything paralysed.

*Diary p.78*

JULY 11th. The day has passed in listless discomfort; if I had been well several things would have interested me during these latter days. The vessel has been followed by many sorts of Petrels; a very elegant one, the Cape-pidgeon, we met as is generally the case, on passing the Tropic. Several Whales have been seen. I just had a peep at one, but to my jaundiced eyes, it even possessed little interest.

*Diary p.78*

JULY 21st. The weather to day felt just like an Autumn day in England. In the



evening the wind freshened & a thick fog came on. These are very frequent in the neighbourhead of the Plata, & we are only now about 50 miles from the mouth. The night was dirty & squally: we were surrounded by Penguins & Seals which made such odd noises that in the middle watch Mr Chaffers went below to report to Mr Wickham that he heard cattle lowing on shore.

Sunday 22nd. We have had this morning a true specimen of the Plata weather. The lightning was most vivid, accompanied by heavy rain & gusts of wind. The day has been exceedingly cold & raw. We passed through large flocks of different sea birds: & some insects & a bird very like a yellow hammer flew on board. We are about 50 miles from Cape St Mary's. I have just been on deck – the night presents a most extraordinary spectacle – the darkness of the sky is interrupted by the most vivid lightning. The tops of our masts & higher yard ends shone with the Electric fluid playing about them; the form of the vane might almost be traced as if it had been rubbed with phosphorous. To complete these natural fireworks, the sea was so highly luminous that the Penguins might be tracked by the stream of light in their wake. As the night looked dirty & there were heavy squalls of rain & wind, we have dropped our anchor.

*Diary* p.80

C.D. TO MISS SUSAN DARWIN

[*Beagle*, at sea]

My dear Susan

As in all probability we shall stay but a short time at M Video, I take the opportunity of an idle evening at sea to begin a letter. We are now (July 14th) about 300 miles from Rio; today for the first time we have a fair wind, before this the calms & light contrary winds, were only disturbed by squalls & gales. For a week I suffered much from sickness, but am now nearly well again. Every body is full of eagerness to commence our real work. After laying in fresh water at M. Video, we sail for Rio Negro. Comparatively near as this is to the civilized world, yet the whole coast & interior country is *totally* unknown. Falconer's account, inaccurate as it must be, is the only one. I expect grand things in Natural History, but if that fails, the whole world, I suppose, does not produce so much game in any one spot. I believe the Captain will proceed many miles up the river & I trust I shall be of the party. I cannot imagine anything more interesting: the only thing unpropitious is the ferocity of the Indians. But I would sooner go with the Captain with 10 men than with anybody else with 20. He is so very prudent & watchful, as long as possible & so resolutely brave when pushed to it.

As far as we are able to guess, the following is the rough outline for the future. After coast of Patagonia return to M Video, then proceed to Terra del [Fuego] & settle the Fuegians. Back to M Video. Afterwards to Valparajso. From which point one more cruize will be to the South (?) & after that the wide world is open to us. Even the prospect of walking where European never before has, hardly recompenses for leaving the glorious regions of the Tropics; already is the change of weather perceptible. Every one has put on cloth cloathes & preparing for still greater extremes our beards are all sprouting – my face at presents looks of about



the same tint as a half washed chimney sweeper. With my pistols in my belt & geological hammer in hand, shall I not look like a grand barbarian?

Before leaving Rio we heard the news of Ld Greys minority, & are all most anxious to see how it will end. It is not very likely that we shall receive letters before our return from the South: this will be a sad disappointment to me, as I then expect [an] answer to my Bahia letter: for this gives to a correspondence an appearance of close connection.

I do not think I have ever given you an account of how the day passes. We breakfast at eight oclock. The invariable maxim is to throw away all politeness – that is never to wait for each other & bolt off the minute one has done eating &c. At sea, when the weather is calm, I work at marine animals, with which the whole ocean abounds; if there is any sea up, I am either sick or contrive to read some voyage or Travels. At one we dine. You shore-going people are lamentably mistaken about the manner of living on board. We have never yet (nor shall we) dined off salt meat. Rice & Peas & Calavanses are excellent vegetables & with good bread, who could want more? Judge Alderson could not be more temperate, as nothing but water comes on the table. At 5 we have tea. The midshipmen's birth have all their meals an hour before us, & the Gun-room an hour afterwards.

July 30th Monte Video. The packet will arrive here in a few days: so that I will make another attempt to fill my letter. We arrived here on the 26th after a long & disagreeable passage. The weather has been too heavy or too light. I expect the further we proceed South, the more uncomfortable I shall find sea-life. It was quite curious how much I felt the change of climate. The thermometer has scarcely ever been below 50°, but yet with thick clothes I could not make myself warm.

Wherever we go, there is sure to be some disturbance – as we passed the Frigate, she made signals to us, 'Clear for action' & 'prepare to cover our boats'. When shortly afterwards a heavy force in boats with Carronades ready mounted, passed by us to go to the Mole. This merely turned out to be a substantial argument to convince the inhabitants they must not plunder British property.

I have only had one good walk on the turf plains, which one has so often read about. There is something very delightful in the free expanse, where nothing guides or bounds your walk. Yet I was disappointed in them, & as far as regards scenery, imagination could not paint anything more dull & uninteresting. How different from the Brazilian forest, where I could sit for hours together & find every minute fresh objects of admiration.

We certainly sail before another packet arrives from England. I am sorry for it. I quite long to hear from you, after you have received a letter from me. I cannot thank you all too much for writing so regularly to me. The very regularity of time is a satisfaction, as it prevents unreasonable expectation. My main object, Natural History, goes on very well, & I certainly have taken many animals &c which would be interesting to naturalists. Independent of this satisfaction, I have begun so many branches, previously new to me, that even already I long to be in England to commence an attack upon severals obscure little individuals. I am



going to draw 25£, which will make altogether since leaving England, 80£ – out of this at least Twenty has not been wasted, in as much as it has been spent about my collection. For the next two months even with my ingenuity, I do not think I shall be able to spend a penny.

I have just received intelligence we sail tomorrow for Buenos Ayres. The Captain has heard some news about an old chart of the coast & he thinks it of sufficient importance to go there. I am glad of it: the more places the merrier: when one is about one cannot see too many. At last I shall deliver the letter to Mr Hughes from Mrs Haycock. The packet calls here on Wednesday so I leave this letter to be forwarded. Give my love to all at dear old Shrewsbury – & dear old Granny,<sup>1</sup>

I am & always shall be yours very affectionately  
Chas Darwin

July 31st

[written across in redder ink]

Monte Video

August 7th. I have procured my letter again in order to write some more. We run up to Buenos Ayres where a Guard Ship fired a shot close to us. This we took up as a great insult, & if our guns had been ready we should have returned it with interest. We immediately made sail & returned here. The Captain reported the circumstance to the frigate *Druid* lying at the Mouth, & she has gone up to Buenos Ayres & obtained ample satisfaction for the insult offered to us. Quarantine for the Cholera was the excuse! We all thought we should at last be able to spend a quiet week, but alas the very morning after the anchoring a serious mutiny in some black troops endangered the safety of the town. We immediately arrived & manned all our boats, & at the request of the inhabitants occupied the principal fort. It was something new to me to walk with Pistols & Cutlass through the streets of a town. It has all ended in smoke. But the consequence is very disagreeable to us, since from the troubled state of the country we cannot walk in the country. The Packet will not sail yet for a week.

And now for a bit of business; in my letter to Erasmus, I tell him Lieut. Blanchard will transact the shipping of my Box. We have just heard the news he has broke & gone to America. I hope Erasmus enquired at the London agent – Mr Palsgrave No. 3, Lyons Inn, Strand. If so, he will have heard of this. If not, a letter had better be sent to Falmouth. I trust they are not lost. What a loss it will be to me. If they are regained, there must be some means of forwarding them to M. Video. I am very sorry for all this trouble.

Yours affectionately,  
Chas Darwin

On the 17th we start for the Rio Negro. Adieu.

*Darwin and Beagle* pp. 71–4

On July 25th, the *Beagle* entered the mouth of the River Plate, and passed the village of Maldonado, off which she had experienced, during her previous voyage, a memorable storm, known locally as a 'pampero'.

<sup>1</sup>His nickname for Susan. RDK



At about three o'clock the wind was light, and veering about from north-west to north-east. There was a heavy bank of clouds in the south-west, and occasionally lightning was visible even in daylight. Myriads of insects, such as butterflies, dragon-flies, and moths, came off from the land; driven, as it appeared, by gusts of heated wind. At four the breeze freshened up from N.N.W., and obliged us to take in all light sails. Maldonado Tower then bore west, and Lobos Island (centre) S.W.b.S. The weather became more unsettled and threatening, though still we had no expectation of any material change before night: but soon after five it became so dark towards the south-west, and the lightning increased so much, that we shortened sail to the reefed topsails and foresail; still hoping to reach our destination before the pampero began. Shortly before six the upper clouds in the south-west quarter assumed a singularly hard, and rolled or tufted appearance, like great bales of black cotton, and altered their forms so rapidly, that I ordered sail to be shortened, and the topsails to be furled, leaving set only a small new foresail. The water was smooth, and, not being deep, there was none of that agitated swell usually noticed before a storm in the great ocean.

Gusts of hot wind came off the nearest land, at intervals of about a minute. The fore-topsail was just furled, and the men down from aloft, the main-topsail in the gaskets, but the men still on the yard, when a furious blast from the north-west struck the ship. The helm was put up, and she paid off fast; yet the wind changed still more quickly, and blew so heavily from south-west, that the foresail split to ribands, and the ship was thrown almost on her beam-ends, and no longer answered her helm. The main-topsail was instantly blown loose out of the men's hands, whose lives were in imminent danger; the fore-topsail blew adrift out of the gaskets; the mainsail blew away out of the gear; the lee hammock-netting was under water; and the vessel apparently capsizing, when topmasts and jib-boom went, close to the caps, and she righted considerably. Both anchors were cut away (for the land was under our lee), and a cable veered upon each, which brought her head to wind, and upright. The heaviest rush of wind had then passed, but it was still blowing a hard gale, and the Beagle was pitching her fore-castle into the short high waves which had risen. As the depth of water was small, and the ground tenacious clay, both anchors held firmly, and our utmost exertions were immediately directed towards clearing the wreck, and saving the remains of our broken spars and tattered sails. Had we suffered in no other way, I should have felt joy at having escaped so well, instead of the deep regret occasioned by the loss of two seamen, whose lives, it seemed, might have been spared to this day had I anchored and struck topmasts, instead of keeping under sail in hopes of entering Maldonado before the pampero began.

When the main-topsail blew away from the men, who struggled hard to keep it fast, they could scarcely hold on, or get off the yard, and the one young man fell from the lee yard-arm into the sea. Poor fellow, he swam well, but in vain: the ship was unmanageable, almost overset, the weather quarter boat stove, and the lee one under water: a grating was thrown to him, and the life-buoy let go, but he was seen no more. Another man was supposed to have been carried overboard with the main-topmast, as he was last seen on the cap.



The starboard quarter boat was stove by the force of the wind; and the other was washed away: and so loud was the sound of the tempest, that I did not hear the masts break, though standing, or rather holding, by the mizen rigging. Never before or since that time have I witnessed such strength, or, I may say, weight of wind: thunder, lightning, hail, and rain, came with it, but they were hardly noticed in the presence of so formidable an accompaniment.

*Narrative* 2 pp.86-8

The following day, the *Beagle* anchored in the bay of Montevideo, and received an unexpected welcome.

JULY 26th. We entered the bay about 9 o'clock. Just as we were coming to an anchor, signals were made from the *Druid*, a frigate lying here; which (to our utter astonishment & amusement) ordered us to 'Clear for action' & shortly after 'Prepare to cover our boats'. We set sail & the latter part of order was shortly explained by the arriving of 6 boats heavily armed with carronades & containing about 40 marines, all ready for fighting, & more than 100 blue jackets. Captain Hamilton came on board & informed us that the present government is a military usurpation; & that the head of the party had seized upon 400 horses, the property of a British subject; & that in short the flotilla of boats went to give weight to his arguments. The revolutions in these countries are quite laughable; some few years ago in Buenos Ayres, they had 14 revolutions in 12 months; things go as quietly as possible; both parties dislike the sight of blood; & so that the one which appears the strongest gains the day. The disturbances do not much affect the inhabitants of the town, for both parties find it best to protect private property. The present governor has about 260 Gaucho cavalry & about same number of Negro infantry; the opposite party is now collecting a force & the moment he enters the town the others will scamper out. Mr Parry (a leading merchant here) says he is quite certain a 150 men from the Frigate could any night take M. Video. The dispute has terminated by a promise of restitution of the horses; but which I do not think is very clear will be kept. I am afraid it is not impossible that the consequences will be very unpleasant to us. The *Druid's* officers have not for some weeks been allowed to go on shore, & perhaps we shall be obliged to act in the same manner. How annoying will be the sight of green turf plains, whilst we are performing a sort of quarantine on board.

*Diary* pp.82-3

A similar episode a few days later is described by FitzRoy.

Scarcely had the *Druid* disappeared beneath the horizon, when the chief of the Monte Video police and the captain of the port came on board the *Beagle* to request assistance in preserving order in the town, and in preventing the aggressions of some mutinous negro soldiers. I was also requested by the Consul-general to afford the British residents any protection in my power; and understanding that their lives, as well as property, were endangered by the



turbulent mutineers, who were more than a match for the few well-disposed soldiers left in the town, I landed with fifty well-armed men, and remained on shore, garrisoning the principal fort, and thus holding the mutineers in check, until more troops were brought in from the neighbouring country, by whom they were surrounded and reduced to subordination. The Beagle's crew were not on shore more than twenty-four hours, and were not called upon to act in any way; but I was told by the principal persons whose lives and property were threatened, that the presence of those seamen certainly prevented bloodshed.

*Narrative* 2 p.95

During the next few weeks Darwin occupied himself in exploring the countryside and writing another letter to Henslow.

JULY 27th. I had no opportunity of taking a long walk; so that I went with the Captain to Rat island; whilst he took sights I found some animals & amongst them there was one very curious; at first sight every one would pronounce it to be a snake: but two small hind legs or rather fins marks the passage by which Nature joins the Lizards to the Snakes.

28th. Landed early in the morning on the Mount. This little hill is about 450 feet high & being by far the most elevated land in the country gives the name Monte Video. The view from the summit is one of the most uninteresting I ever beheld. Not a tree or a house, or trace of cultivation give cheerfulness to the scene. An undulating green plain & large herds of cattle has not even the charm of novelty. Whoever has seen Cambridgeshire, if in his mind he changes arable into pasture ground & roots out every tree, may say he has seen Monte Video. Although this is true, yet there is a charm in the unconfined feeling of walking over the boundless turf plain. Moreover if your view is limited to a small space, many objects possess great beauty; some of the smallest birds are most brilliantly coloured, much more so than those in Brazil. The bright green turf being browsed short by the cattle, is ornamented by dwarf flowers; amongst which to my eyes the Daisy claimed the place of an old friend. The only other plants of large size are tall rushes & a thistle, resembling much the Acanthus; the latter with its silvery foliage covers large spaces of ground. I went on board with a party of midshipmen; who had been shooting & had killed several brace of Partridges & wild Ducks, & had caught a large Guano about 3 feet long. These lizards at certain times of the year are reckoned excellent food. The evening was calm & bright, but in the middle of the night, it blew a sudden gale. All hands were piped up to send Top-gallant masts on deck & to get in the Cutter. In such scenes of confusion, I am doubtful whether the war of the elements or shouts of the officers be most discordant.

*Diary* p.83

AUG. 13th. At last the unsettled politicks & weather have permitted us to walk in the country. Wickham, Sullivan, Hammond & myself went out shooting & if our sport was not very good the exercise was most delightful. Hammond & myself





*Montevideo*

walked in a direct line for several miles to some plains covered with thistles, whence we hoped to find a flock of Ostriches. We saw one in the distance; if I had been by myself, I should have said it was a very large deer running like a racehorse; as the distance increased it looked more like a large hawk skimming over the ground; the rapidity of its movements were astonishing. As the breeze was rather too stiff for boats, it had been determined to walk from the Mount round the bay to the town. When far distant from it, Wickham & Sullivan found themselves so tired, that they declared they could move no further. By good luck a horseman came up, whom we hired to carry them by turns till another horse was found; & thus we arrived just before the city gates were closed for the night.

*Diary p.89*

15th. As the boat was landing me at the Mount, we surprised a large Cabra[?] or Capincha on the rocks. After a long & animated chase in a little bay I succeeded in shooting it through the head with a ball. These animals abound in the Orinoco & are not uncommon here, but from their shyness & powers of swimming & diving are difficult to be obtained. It is like in its structure a large guinea pig; in its habits a water rat. It weighed 98 pounds. Having sent my game on board in triumph, I collected great numbers of different animals: some beautiful snakes & lizards & beetles. Under stones were several scorpions about 2 inches long; when pressed



by a stick to the ground, they struck it with their stings with such force as very distinctly to be heard.

The Druid has returned from Buenos Ayres & brought from its government a long apology for the insult offered to us. The Captain of the Guard-ship was immediately arrested & it was left to the British consul's choice whether he should any longer retain his commission.

*Diary* pp.89-90

C.D. TO PROFESSOR HENSLOW

15 Aug 1832 Monte Video

My dear Henslow

We are now beating up the Rio Plata, & I take the opportunity of beginning a letter to you. I did not send off the specimens from R Janeiro; as I grudged the time it would take to pack them up. They are now ready to be sent off, & most probably by the Packet. If so they go to Falmouth (where C. FitzRoy has made arrangements) & so will not trouble your Brothers agent in London. When I left England, I was not fully aware how essential a kindness you offered me, when you undertook to receive my boxes. I do not know what I should do without such headquarters. And now for an apologetical prose about my collection. I am afraid you will say it is very small, but I have not been idle & you must recollect that in lower tribes, what a very small show hundreds of species make. The box contains a good many geological specimens. I am well aware that the greater number are too small. But I maintain that no person has a right to accuse me, till he has tried carrying rocks under a Tropical sun. I have endeavoured to get specimens of every variety of rock, & have written notes upon all. If you think it worth your while to examine any of them, I shall be *very* glad of some mineralogical information, especially in any numbers between 1 & 254, which include St Jago rocks. By my Catalogue, I shall know which you may refer to. As for my Plants, 'pudet pigetque mihi'. All I can say is that when objects are present which I can observe & particularize about, I cannot summon resolution to collect where I know nothing.

It is positively distressing to walk in the glorious forest, amidst such treasures, & feel they are all thrown away upon one. My collection from the Abrolhos is interesting as I suspect it nearly contains the whole flowering Vegetation, & indeed from extreme sterility the same may almost be said of St Jago. I have sent home 4 bottles with animals in spirits; I have three more, but would not send them till I had a fourth. I shall be anxious to know how they fare. I made an enormous collection of Arachnidae at Rio. Also a good many small beetles in pill-boxes: but it is not the best time of year for the latter. As I have only  $\frac{3}{4}$  of a case of Diptera etc I have not sent them. Amongst the lower animals, nothing has so much interested me as finding 2 species of elegantly coloured true Planariae, inhabiting the dry forest! The false relation they bear to Snails is the most extraordinary thing of the kind I have ever seen. In the same genus (or more truly family) some of the marine species possess an organization so marvellous – that I can scarcely credit my eyesight. Everyone has heard of the discoloured streaks of



water in the Equatorial regions. One I examined was owing to the presence of such minute *Oscillaria* that in each square inch of surface there must have been at least one hundred thousand present. After this I had better be silent, for you will think me a Baron Munchausen amongst Naturalists.

Most assuredly I might collect a far greater number of specimens of Invertebrate animals if I took less time over each: But I have come to the conclusion that 2 animals with their original colour & shape noted down, will be more valuable to Naturalists than 6 with only dates & place. I hope you will send me your criticisms about my collection; & it will be my endeavour that nothing you say shall be lost on me. I would send home my writing with my specimens, only I find I have so repeatedly occasion to refer back, that it would be a serious loss to me. I cannot conclude about my collections, without adding that I implicitly trust in you, keeping an exact account against all the expense of *boxes etc etc*.

At this present minute we are at anchor in the mouth of the river: & such a strange scene as it is. Everything is in flames – the sky with lightning, the water with luminous particles, & even the very masts are pointed with a blue flame. I expect great interest in scouring over the plains of M Video, yet I look back with regret to the Tropics, that magic line to all Naturalists. The delight of sitting on a decaying trunk amidst the quiet gloom of the forest is unspeakable & never to be forgotten. How often have I then wished for you – when I see a Banana, I well recollect admiring them with you in Cambridge – little did I then think how soon I should eat their fruit.

AUG. 15th. In a few days the Box will go by the Emulous Packet (Capt Cooke) to Falmouth & will be forwarded to you. This letter goes the same way so that if in course of due time you do not receive the box, will you be kind enough to write to Falmouth. We have been here (Monte Video) for some time; but owing to bad weather & continual fighting on shore have scarcely ever been able to walk in the country. I have collected during the last month nothing. But today I have been out & returned like Noah's ark, with animals of all sorts. I have today to my astonishment found 2 *Planariae* living under dry stones. Ask L. Jenyns if he has ever heard of this fact. I also found a most curious snail & Spiders, beetles, snakes, scorpions ad libitum. And to conclude shot a *Cavia* weighing a cwt. On Friday we sail for the Rio Negro, & then will commence our real wild work. I look forward with dread to the wet stormy regions of the South. But after so much pleasure I must put up with some sea-sickness & misery. Remember me most kindly to everybody & believe me, my dear Henslow.

Yours affectionately  
Chas Darwin

*Darwin & Henslow pp. 57–60*

R.F. TO CAPTAIN BEAUFORT, PRIVATE

H.M.S. Beagle, Monte Video. Augt 15, 1832

My dear Sir,

I have followed your advice, as to the length of letters, and am afraid that you



will blame me for having taken your expressions *too* literally, and having said *too much* in my official letter to you. If so you will be still more annoyed by the following epistle; but the pleasure of unloading one's mind to a real friend is such that I risk his wishing me under water. Oh that time and Resources could be multiplied in proportion to the demand – I would then give you and myself satisfaction. Every fresh step only shews me a multitude of others which ought to be taken; and the more I scribble and think, the more I find to scribble and think about.

All goes well – extremely well – on board. I can say, what seldom may be said, with truth, that I do not wish to change a single Officer or Man, and that I have not more sincere friends in the world than my own Officers. From the *Druid* I have obtained an old friend and shipmate named Hamond (a passed Mid) – Captain Hamilton has *lent* him; and in some manner I *must* contrive to keep him. Mr Darwin is a very superior young man, and the very best (as far as I can judge) that could have been selected for the task. He has a mixture of necessary qualities which makes him feel at home, and happy, and makes every one his friend. By this Packet, the *Emulous*, he sends his first collection, to the *care* of Professor Henslow at Cambridge, there to await his return to England. I fancy that though of small things, it is numerous and valuable, and will convince the Cantabrigians that their envoy is no Idler.

Mr Earle has been tormented by Illness, but he is now recovering rapidly, and regaining his Strength and Spirits. His forte is the Human Figure, and in *that* he excels. We were fortunate in so soon parting with the Surgeon. He was a sad empty headed Coxcomb, and I as egregious an Ass in not finding him out at an earlier period. Mr Bynoe, now acting in his stead, is the very reverse, and esteemed by all.

Wherever we go, we find uproar, confusion and rainy weather. Revolution is actually the fashion in South America. Pernambuco, Bahia, Rio de Janeiro and Monte Video have each their civil wars, and upsetting of constitutions. We have had enough to do to keep quiet and out of harm's way. Our landing here the other day was a most unpleasant job – it was treading on cracked Ice, and right glad was I to get on board again. Refugees from both parties have been trying to induce me to give them shelter, and to interest me in their quarrels, but I plead neutrality, and haul off from all. I was very much vexed at the Buenos Ayres affair, because they were so absurd in their conduct, and it was not pleasant to have a shot near the Chronometers. A shot into the works of a Steam Engine would not do so much damage. I am *told* that the Buenos Ayrean Government have apologized to Captain Hamilton for the Insult to the Flag, and to me for the Insult to the Vessel, & that they have written a letter to me on the subject. The letter has not yet arrived.

What the French Corvette *l'Emulation* has been about, is doubtful. Every one *tells* me she has only determined the position of *some* Points, and has done little *new* work. I suspect there was a political scheme carrying on *also*, and that they were more intent upon ascertaining the resources of the country upon the banks of the river, and the state of the interior, with a view to colonization or emigration, than



in sounding the depths of water or fixing the limits of the banks. However, time will shew – Surveys cannot be made and published at the same time.

Have you heard of the Voyage round the World lately made by the French Corvette, 'La Favorite'? She arrived at Rio, and sailed thence for France, in April last. Can you ascertain what route she followed in crossing the South Seas? – and will you have the goodness to tell me, before we steer that way some two years hence? I could not ascertain at Rio, because Villeneuve did not know, or if he knew, would not tell.

The Fuegians are doing very well. In November I trust that they will revisit their native country. Long days and warmer weather will then favor us. I am most anxious to be doing, for all the past employment appears to me to be only preparing & practising.

I have landed some heavy stores, a large part of our preserved meat, and other things which will be useful to us hereafter but which will not be wanted on this side of Cape Horn. They are in perfect safety, in charge of the Consul; and by their removal we gain room & lose weight.

I have written a special letter about the acting Boatswain of this vessel, and if you will befriend *him* and gratify *me* by procuring his appointment, He – I – & – all on board this Vessel will feel *very* thankful.

Messrs Darwin, Wickham, Earle and Stokes desire their respects & kind wishes. No change, of any kind, would make me look differently upon my present employment, or induce me to relax from my utmost endeavor to give you satisfaction and fulfill your excellent Instructions. May you be happy, with your family?

Ever yours most faithfully,  
Robt FitzRoy

P.S. Aug. 19th.

I have opened my letter to tell you that a Gale of wind prevented our sailing yesterday, and that I have bought for a most *Jewish Price*, a collection of Manuscript Charts (exceedingly well done) of the coast between the Straits of Magellan and Brazil. I send the Brazil Coast, for your use, but pray let me have it again in future. The others will come into use & will find their way to you after I have *stolen* from them, after *comparison*, and have exhausted them.

Ever most truly & respectfully yours,  
Robt FitzRoy

We are under way.

[from the archives of the Hydrographic Department, Taunton]



R.F. TO CAPTAIN BEAUFORT, OFFICIAL

No. 6

His Majesty's Surveying Sloop 'Beagle', Monte Video, 16th August 1832  
Sir,

On the 5th of July the Beagle sailed from Rio de Janeiro, and on the 26th she anchored off Monte Video.

Continual strong southerly winds prevented her making a shorter passage – without carrying sail in a manner that would cause the motion of the Vessel to affect the Chronometers materially.

Being informed that some valuable manuscript Charts, unknown in Europe, were deposited in a Library at Buenos Ayres, and that they might be seen and copied; wishing also to compare the English Chart of the River Plate with that of Aizpurua, published in the United States of America, and *said* by *many* persons to be more correct, I sailed from Monte Video on the 31st of July, anchored off Buenos Ayres on the evening of the 1st, and in the Roads on the 2nd of August.

In consequence of the affair which is detailed in the accompanying letter to Captain G. W. Hamilton C.B., I left Buenos Ayres Roads within two hours after I had anchored, and returned forthwith to Monte Video.

To prevent my principal object being frustrated, I commissioned a person to examine, and purchase or copy, every document which may be useful, and I am awaiting his arrival in the Emulous Packet. If there is sufficient reason, I will go again at a future opportunity.

I took no Pilot, and kept under way throughout the night with contrary winds, trusting to the English Chart. Our track, soundings, and observations *verify that* Chart, but cannot be reconciled to the American. I have passed between Buenos Ayres and Monte Video six times in Frigates, and several times in small Vessels, and I have been about the English Bank and on both sides of the River, and never saw the English Chart proved incorrect. That additions may be made, as to most Charts, there can be no doubt.

It is *said* that the French Surveying Ship 'l'Emulation' has not added so much as might have been expected. Accompanying this letter is a copy of some of the determinations of M. Barral, given to me by the Viscomte de Villeneuve, also one of Aizpurua's Charts.

I regret that the excellent Chart, the results of your own, of Captain Heywood's, and of Captain Foster's observations, should be unknown here, excepting on board of English Men of War, while the production (of which I send a sample) is sold in *many* shops at Monte Video and at Buenos Ayres.

I went over Aizpurua's Chart (a few days since) with one of the best Pilots for the River; and the faults which he pointed out strongly confirmed what I have already said of their respective merits.

In the Entrance of the River, East of the meridian of Cape St Mary – near the Latitude of the English Bank – there are many shoal patches, having from *seven* to *twelve* fathoms, which are not at present laid down. I will attend to them, as opportunities offer, in passing.

In Captain Heywood's directions for the River Plate he mentions that he has



*heard* of the Current running at times five or six knots. I have myself *seen* it, while at anchor in the Beagle – in the fair way, south of Lobos Island – running more than five knots by the Log; but *those very strong* Currents are *extremely* rare.

Having sent away the Chronometer work hastily and unfinished, I now send a duplicate of one part which will explain the rest to any one who feels sufficiently interested in the subject to examine the work in detail.

During our short stay here we have been called upon to act in a manner foreign to our employment, but only for two days. The accompanying papers, copies of those sent to the Senior Officer in the River Plate, will explain the whole affair.

Directly the Emulous Packet arrives from Buenos Ayres (and she is hourly expected) the Beagle will leave Monte Video and examine the Coast between the River Plate and the Bay of San Matias (or St Matthew). I hope to return here early in October and sail again immediately to Tierra del Fuego, for whose climate the season will then be the most suitable.

I have now to request that I may be furnished with the following Charts and Papers, as they will expedite the work very materially.

Charts.

River Plate, two sheets, two Copies

Captain King's Charts of these Coasts (when published), six Copies

South Sea, in three sheets, two Copies

Tracing Paper . . . two quires

The two copies of the River Plate, two copies of Captain King's Charts, and two of the South Sea, are for *working upon*, for laying down every addition which is in our power to make, and sending them to England at different times without depriving ourselves of the only copy on board.

The tracing paper is extremely useful. Having a large glass tracing frame, no opportunity of tracing Charts or Plans, printed or manuscript, which I can borrow or buy, and which promise to be of any use, is omitted; and I did not bring enough from England.

The other four Copies of Captain King's Charts are requested by me for the sole purpose of giving them away from time to time to the Local Authorities who may render us assistance in our progress, and who did materially assist the Adventure and the Beagle in their former voyage.

May I beg also that the Charts and Paper may be packed in tin and rolled instead of doubled. I have the honor of being Sir,

Your most obedient humble Servant,  
Robt FitzRoy  
Commander

P.S. The return of His Majesty's Ship 'Druid' has enabled me to send a copy of the papers which have passed relative to the Buenos Ayrean affair, in which the Beagle was concerned.

With reference to the expressions which have offended the Buenos Ayrean Government, I beg to inform you, and I request you will make known if necessary, that I did *not* say that 'I should go to some other country where the



government was more civilized', but that my expression to the Health Officer *was* 'Say to your Government that I shall return to a more civilized country where Boats are sent more frequently than Balls.'

In hailing the Guard Vessel I did *not* in *any* way allude to the *Government*, and my words to *her* *Commander* were 'If you dare to fire another shot at a British Man of War you may expect to have your Hulk sunk; and if you fire at *this* Vessel, I will return a broadside for every shot.'

Robt FitzRoy  
Commander

[from the archives of the Hydrographic Department, Taunton]

On August 19th the *Beagle* set off on her first cruise to survey the coast around Bahia Blanca, four hundred miles south-west of the River Plate. FitzRoy took a party to visit the settlements at the head of the bay.

SEPT. 7. Messrs Darwin, Rowlett, and Harris set out with me to visit the Buenos Ayrean settlement, called Argentina. Mr Harris undertook to be our guide, but after two hours' sailing and pulling we found ourselves near the head of a creek, between two soft mud banks, where we could neither row nor turn the boat. We could not land because the mud was too soft to bear our weight, so there we staid till the tide flowed. About two hours after this stoppage there was water enough for us to cross a large bank, and gain the right channel, from which we had deviated, and then, with a flowing tide, we made rapid progress, until the 'Guardia' was announced to us. This was a small hut near the water side, but to reach it we had to wind along a tortuous canal, between banks of soft mud: and when we arrived at the landing-place seven hours had been passed among rushy mud banks, surrounded by which we were often prevented from seeing any solid land. The water was every where salt, the tide running strongly, and the boat often aground.

Waiting to meet us was an assemblage of grotesque figures, which I shall not easily forget – a painter would have been charmed with them. A dark visaged Quixotic character, partly in uniform, mounted on a large lean horse, and attended by several wild looking, but gaily dressed gauchos, was nearest to us. Behind him, a little on one side, were a few irregular soldiers, variously armed, and no two dressed alike, but well mounted, and desperate-looking fellows; while on the other side, a group of almost naked Indian prisoners sat devouring the remains of a half roasted horse; and as they scowled at us savagely, still holding the large bones they had been gnawing, with their rough hair and scanty substitutes for clothing blown about by the wind, I thought I had never beheld a more singular group.

The tall man in uniform was the Commandant of the settlement, or fortress, called Argentina: he and his soldiers had arrived to welcome us, supposing that we were bringing supplies from Buenos Ayres for the needy colony. The Indian prisoners had been brought to work, and assist in carrying the supplies which were expected. Finding that we were neither Buenos Ayreans, nor traders from



any other place, it was supposed that we must be spies sent to reconnoitre the place previous to a hostile attack. Neither the explanations nor assertions of Mr Harris had any weight, for as he was our countryman, they naturally concluded he was in league with us; yet, as the commandant had some idea that we might, by possibility, be what we maintained we were, he disregarded the whispers and suggestions of his people, and offered to carry us to the settlement for a night's lodging.

Leaving the boat's crew to bivouac, as usual, I accepted a horse offered to me, and took the purser up behind; Mr Darwin and Harris being also mounted behind two gaucho soldiers, away we went across a flat plain to the settlement. Mr Darwin was carried off before the rest of the party, to be cross-questioned by an old major, who seemed to be considered the wisest man of the detachment, and he, poor old soul, thought we were very suspicious characters, especially Mr Darwin, whose objects seemed most mysterious.

In consequence, we were watched, though otherwise most hospitably treated; and when I proposed to return, next morning, to the boat, trifling excuses were made about the want of horses and fear of Indians arriving, by which I saw that the commandant wished to detain us, but was unwilling to do so forcibly; telling him, therefore, I should walk back, and setting out to do so, I elicited an order for horses, maugre the fears and advice of his major, who gave him all sorts of warnings about us. However, he sent an escort with us, and a troop of gaucho soldiers were that very morning posted upon the rising grounds nearest to the Beagle, to keep a watch on our movements.

We afterwards heard, that the old major's suspicions had been very much increased by Harris's explanation of Mr Darwin's occupation. 'Un naturalista' was a term unheard of by any person in the settlement, and being unluckily explained by Harris as meaning 'a man that knows every thing,' any further attempt to quiet anxiety was useless.

*Narrative* 2 pp. 102-4

We returned to the Beagle without another delay among the mud-banks, and found the rising grounds (heights they could not be called), nearest the ship, occupied by the troop of gaucho soldiers. As they did not interfere with us, our surveying operations were begun, and carried on as usual. Mr Darwin, and those who could be spared from duties afloat, roamed about the country; and a brisk trade was opened with the soldiers for ostriches and their eggs, for deer, cavies, and armadilloes.

My friend's attention was soon attracted to some low cliffs near Point Alta, where he found some of those huge fossil bones, described in his work; and notwithstanding our smiles at the cargoes of apparent rubbish which he frequently brought on board, he and his servant used their pick-axes in earnest, and brought away what have since proved to be most interesting and valuable remains of extinct animals.

The soldiers appointed to watch our movements soon relaxed so far as to spend



nearly all their time in hunting animals for us. Besides those already mentioned, they one day brought a fine living puma, in hopes I should offer a good price, and embark it alive; but having no wish for so troublesome a companion in our crowded little vessel, I only bargained for its skin. The soldiers made a hearty meal of the flesh, and asserted that it was good, though inferior to that of a horse, which I had seen them eating a day or two previously.

Four kinds of armadilloes were described to us by these men, of which we saw but two: the quiriquincha, with nine bands; the mataca-bola, which rolls up into a ball; the peludo, which is large and hairy; and the molito, of which I heard only the name. Mr Rowlett saw a black fox, and he was told that there are wolves in the neighbourhood. Two small burrowing animals are also found: the zorillo, or skunk; and the tucu-tucu. While speaking of animals, I should say that the commandant (Rodriguez) told me, that he had once seen, in Paraguay, a 'gran bestia,' not many months old, but which then stood about four feet high. It was very fierce, and secured by a chain. Its shape resembled that of a hog, but it had talons on its feet instead of hoofs; the snout was like a hog's, but much longer. When half-grown, he was told that it would be capable of seizing and carrying away a horse or a bullock. I concluded that he must have seen a tapir or anta; yet as he persisted in asserting that the animal he saw was a beast of prey, and that it was extremely rare, I here repeat what he said.

Abundance — I may well say shoals of fish were caught by our men, whenever we hauled the nets at a proper time (the beginning of the flood-tide); and as they were chiefly unknown to naturalists, Mr Earle made careful drawings of them, and Mr Darwin preserved many in spirits. We procured plenty of good fresh water from wells near the beach, and small wood for fuel in their immediate neighbourhood. The climate is delightful, and healthy to the utmost degree, notwithstanding such extensive flats, half-covered with water, and so many large mud-banks. Perhaps the tides, which rise from eight to twelve feet, and run two or three knots an hour, tend to purify the air; indeed, as the whole inlet is of salt water, there may be no cause for such effects as would be expected in similar situations near fresh water.

In our rambles over the country, near Port Belgrano, we every where found small pieces of pumice-stone; and till Mr Darwin examined the Ventana, supposed they had been thrown thence: he has, however, ascertained that it is not volcanic; and, I believe, concludes that these fragments came from the Cordillera of the Andes.

*Narrative* 2 pp. 106-8

After a few days' examination of Port Belgrano, and making inquiries of Harris, as well as those persons at Argentina who knew something of the neighbouring waters and shores, I was convinced that the Beagle alone could not explore them, so far as to make her survey of any real use, unless she were to sacrifice a great deal more time than would be admissible, considering the other objects of her expedition. What then was to be done? Open boats could not



explore the seaward limits of those numerous shoals which lie between Blanco Bay and the river Negro, because there are dangerous 'races', and often heavy seas. The Beagle herself, no doubt, could do so, and her boats might explore the inlets; but, the time that such a proceeding would occupy was alarming to contemplate. I might run along the outer line of danger in the Beagle, and connect it with the soundings in the offing; but how could an English ship surveying a frequented coast overlook six large ports, only because their examination required time, and was dangerous? At last, after much anxious deliberation, I decided to hire two small schooners – or rather decked boats, schooner-rigged – from Mr Harris, and employ them in assisting the Beagle and her boats. Mr Harris was to be in the larger, as pilot to Lieutenant Wickham – and his friend Mr Roberts, also settled at Del Carmen, on the river Negro, was to be Mr Stokes's pilot in the smaller vessel. These small craft, of fifteen and nine tons respectively, guided by their owners, who had for years frequented this complication of banks, harbours, and tides, seemed to me capable of fulfilling the desired object – under command of such steady and able heads as the officers mentioned – with this great advantage; that, while the Beagle might be procuring supplies at Monte Video, going with the Fuegians on her first trip to the southward, and visiting the Falkland islands, the survey of all those intricacies between Blanco Bay and San Blas might be carried on steadily during the finest time of year. One serious difficulty, that of my not being authorized to hire or purchase assistance on account of the Government, I did not then dwell upon, for I was anxious and eager, and, it has proved, too sanguine. I made an agreement with Mr Harris, on my own individual responsibility, for such payment as seemed to be fair compensation for his stipulated services, and I did hope that if the results of these arrangements should turn out well, I should stand excused for having presumed to act so freely, and should be reimbursed for the sum laid out, which I could so ill spare. However, I foresaw and was willing to run the risk, and now console myself for this, and other subsequent mortifications, by the reflection that the service entrusted to me did not suffer.

*Narrative* 2 pp. 109–10

SEPT. 17th & 18th. Have been employed during these two days with various marine animals, which I procured from the beach & by dredging. What we had for dinner to day would sound very odd in England: Ostrich dumpling & Armadilloes; the former would never be recognised as a bird but rather as beef. The Armadilloes when, unlike to the Gauchos' fashion, cooked without their cases, taste & look like a duck. Both of them are very good.

19th. Walked to the plains beyond the sand hillock & shot some small birds for specimens. It is a complete puzzle to all of us, how the Ostriches, Deer, Cavies, &c. which are so very numerous, contrive to get water. Not one of us has seen the smallest puddle (excepting the well which is 8 feet deep) & it is scarcely credible they can exist without drinking. I should think this sandy country in the summer time must be a complete desert; even now in spring & all the flowers in bud, the



sun is very powerful, there being no shelter & the heat being reflected from the sand hillocks.

*Diary* p.102

SEPT. 22nd. Had a very pleasant cruize about the Bay with the Captain & Sullivan. We staid some time on Punta Alta about ten miles from the ship; here I found some rocks. These are the first I have seen, & are very interesting from containing numerous shells & the bones of large animals. The day was perfectly calm; the smooth water & the sky were indistinctly separated by the ribbon of mud banks: the whole formed a most unpicturesque picture. It is a pity such bright clear weather should be wasted on a country, where half its charms do not appear. We got on board just in time to escape a heavy squall & rain.

Sunday 23rd. A large party was sent to fish in a creek about 8 miles distant; great numbers of fish were caught. I walked on to Punta Alta to look after fossils; & to my great joy, I found the head of some large animal, imbedded in a soft rock. It took me nearly three hours to get it out. As far as I am able to judge, it is allied to the Rhinoceros. I did not get it on board till some hours after it was dark.

*Diary* pp.102-3

OCT. 1st. The morning threatened us with heavy weather; but it blew over in a hail storm. We have anchored near to a cliff, upon which the Captain intends to erect some land-mark as a guide in entering the harbor.

2nd. Early in the morning the Captain with a large party landed in the four whale boats. Dinner for all hands was taken, as it was intended to work at the land-mark all day & return in the evening. King & I went in one direction to geologize & Mr Bynoe in another to shoot. During our walk I observed the wind had freshened & altered its point; but I paid no further attention to it. When we returned to the beach, we found two of the boats hauled up high & dry & the others gone on board. The Captain, two hours previously, had had some difficulty in getting off & now the line of white breakers clearly showed the impossibility. It was an unpleasant prospect to pass the night with thin clothes on the bare ground; but it was unavoidable, so we made the best of it. Mr Stokes & Johnson were left in command & made what arrangements they could. At night no supper was served out; as we were 18 on shore & very little food left. We made a sort of tent or screen with the boat's sails & prepared to pass the night. It was very cold, but by all huddling in a heap we managed pretty well till the rain began, & then we were sufficiently miserable.

3rd. At day-break things wore a very bad appearance. The sky looked dirty & it blew a gale of wind; a heavy surf was roaring on the beach; & what was the worst of all, the men thought this weather would last. The Beagle was pitching very deeply & we thought it not impossible she would be forced to slip cable & run out to sea. We afterwards heard she rode it out well, but that some of the seas went right over her, although having 120 fathoms of cable out. It was now time to look after our provisions: we breakfasted on some small birds & two gulls, & a large



hawk which was found dead on the beach. Our dinner was not much better, as it consisted in a fish left by the tide & the bones of the meat, which we were determined to keep for the next day. In the evening, however, to our great joy & surprise the wind lulled & the Captain in his boat was able to come within some hundred yards of the coast; he then threw over a cask with provisions, which some of the men swam out to & secured. This was all very well; but against the cold night there was no remedy. Nothing would break the wind, which was so cold that there was snow in the morning on the Sierra de Ventana. I never knew how painful cold could be; I was unable to sleep, even for a minute, from my body shivering so much. The men also who swam for the provisions suffered extremely, from not being able to get warm again.

4th. By the middle of the next day we were all on board the *Beagle*; & most thoroughly after our little adventure did we enjoy its luxuries. In the evening we moved our anchorage and stood in towards our old place.

*Diary* pp. 104-5

OCT. 8th. The Captain had bought from the Gaucho soldiers a large Puma or South American lion, & this morning it was killed for its skin. These animals are common in the Pampas; I have frequently seen their footsteps in my walks. It is said they will not attack a man; though they evidently are quite strong enough. The Gauchos secured this one by first throwing the balls & entangling its front legs; they then lassoed or noosed him, when by riding round a bush & throwing other lassos, he was soon lashed firm and secured.

After breakfast I walked to Punta Alta, the same place where I have before found fossils. I obtained a jaw bone, which contained a tooth: by this I found out that it belongs to the great ante-diluvial animal the *Megatherium*. This is particularly interesting as the only specimens in Europe are in the King's collection at Madrid, where, for all purposes of science they are nearly as much hidden as if in their primaeval rock. I also caught a large snake, which at the time I knew to be venomous; but now I find it equals in its poisonous qualities the Rattle snake. In its structure it is very curious, & marks the passage between the common venomous & the rattle snakes. Its tail is terminated by a hard oval point, & which, I observe, it vibrates as those possessed with a more perfect organ are known to do.

*Diary* pp. 105-6

On October 18th, having refitted the two schooners and left them to continue the survey under the command of Lieutenant Wickham, the *Beagle* returned to the River Plate to prepare for a visit to Tierra del Fuego. Darwin went to Buenos Aires and wrote some more letters.

NOV. 5th. Rode about 6 leagues into the camp, to an English Estancia. The country is very level & in places from Willows & Poplars being planted by the ditches, much resembled Cambridgeshire. Generally it is open & consists either of bright green turf or large tracts of a very tall Sow-thistle, (8 or 9 feet high).



Even the very roads were burrowed by the Viscache. This animal is nocturnal in its habits; in structure it is allied to the Cavies, having gnawing teeth & only three toes to its hind legs; it differs in having a tail. The holes made by this animal yearly cause the death of many of the Gauchos. As Head mentions, every burrow is tenanted by a small owl, who, as you ride past, most gravely stares at you.

6th. Spent the day in shopping & in gaining information relative to the geology of the country. I trust when the Beagle returns for the winter to the Rio Plata I shall be able to make some long excursions in this unpicturesque but curious country. Buenos Ayres is an excellent place for making purchases. There are many shops kept by Englishmen & full of English goods. Indeed the whole town has more of an European look than any I have seen in S. America. One is called back to the true locality, both by the Gauchos riding through the streets with their gay coloured Ponchos, & by the dress of the Spanish ladies. This latter, although not differing much from an English one, is most elegant & simple. In the hair (which is beautifully arranged) they wear an *enormous* comb; from this a large silk shawl folds round the upper part of the body. Their walk is most graceful, & although often disappointed, one never saw one of their charming backs, without crying out, 'how beautiful she must be'.

*Diary p.111*

C.D. TO MISS CAROLINE DARWIN

[*Beagle*, at sea]

My dear Caroline

We are now October 24th – within a few leagues of M. Video; & shall before morning drop our anchor there. This first cruize has afforded very little matter for letters or for any other purpose. You recollect the sand hillocks at Barmouth; we have sailed along 240 miles of coast, solely composed of such hillocks. Instead of being as at Barmouth merely a border for the sea, here in Patagonia they extend for some miles, till you reach the open plains, which are far less picturesque than the sand-hillocks. Even with this & a good deal of bad-weather on our passage down, I have enjoyed the cruize. Our furthest position South was Bahia Blanca, (a little N. of Rio Negro), where there is a small Spanish settlement or rather a fort against the Indians. On entering the bay we met a little Schooner in which was an Englishman who is connected with two other small vessels (or rather covered boats) employed in sealing. The man was tolerably acquainted with the coast: the Captain thought this so fine a chance, that he has hired two of them & put two officers in each. They now are surveying the coast, which from the number of banks would have detained us a long time. On our return from M: V: (which will be as soon as possible) we meet them at Rio Negro, & leaving them to work, push on for the South. This second cruize will be a very long one; during it we settle the Fuegians & probably survey the Falklands islands: After this is over (it is an awful long time to talk about) we return to M Video: pick up our officers & then round the Horn & once more enter the glorious, delicious intertropical seas.

I find the peep of Tropical scenery has given me a tenfold wish to see more: it is no exaggeration to say, no one can know how beautiful the world we inhabit is, who has only been in the colder climes. The chief source of pleasure has been to





*Montevideo*

me, during these two months, from Nat: History. I have been wonderfully lucky with fossil bones – some of the animals must have been of great dimensions: I am almost sure that many of them are quite new; this is always pleasant, but with the antediluvian animals it is doubly so. I found parts of the curious osseous coat, which is attributed to the *Megatherium*; as the only specimens in Europe are at Madrid (originally in 1798 from Buenos Ayres) this alone is enough to repay some wearisome minutes. Amongst living animals I have not been less fortunate. I also had in September some good sporting; I shot one day a fine buck & doe, but in this line I never enjoyed anything so much as Ostrich hunting with the wild Soldiers, who are more than half Indians. They catch them by throwing two balls, which are attached to the ends of a thong, so as to entangle their legs: it was a fine animated chace. They found the same day 64 of their eggs.

It is now nearly four months since I have received a letter, so you can imagine how anxious I am for tomorrow morning: We are all very curious about politicks; all that we know is that the bill is past: but whether there is a King or a republic according to the Captain, remains to be proved.

Monte Video. I have just received your letter of June 28th & Susan's of May 12th. Far from your letters *not* containing news; I am astounded at the wonderful number of events, which monthly take place – and I assure you no half-famished



wretch ever swallowed food more eagerly than I do letters. I received one from Fox; who seems to have been suffering from much illness; but he now writes in good spirits. Tell Susan her most elegant note of Tournure to Cap. Beaufort has travelled here. Capt. Beaufort included it in a note to me 'thinking that at a distance of 1000 miles, the hand-writing of those dear to us is gratifying'. The Captain is evidently a good hand at turning the Kaleidoscope of 'thanks', 'gratitude', 'compliments', & 'c' & 'c'. If at any time, you want to send me any large letters (including papers &c double) put it under cover to Cap: B: & he says he will forward them.

On Monday we run up to Buenos Ayres, as the Captain wants to communicate with the government – we shall stay there for a week. I intend to have some good gallops over the Pampas. I suppose you all well know Head's book – for *accuracy* & animation it is beyond praise. After returning here we stay another week & then for Terra del. This second cruize will I suppose last between 6 & 9 months; so make up your minds for a gap in my correspondence but *not in yours*. You need be in no fears about directions; till told to alter; merely put S America: all letters for HMS Ships pass through the Flag ship which knows where to send to all on the station. Although my letters do not tell much of my proceedings I continue steadily writing the journal; in proof of which the number on the page now is 250.

We are now, Novemb: 11, beating down the river to Monte Video. We stayed a week at Buenos Ayres & much enjoyed this long *cruise* on shore. The city is a fine large one, but the country beyond everything stupid. I saw a good deal of Mr Hughes – nothing could be more obliging than he was; he obtained a great deal of information for me & has undertaken several troublesome commissions, which otherwise I never could have managed. When we winter in the Plata. I intend taking a long excursion to geologize the Uruguay country & shall see him again in B. Ayres:–I think I have infected him with a slight geological mania, which I hope he will encourage. We saw there also a Colonel Vernon, a brother-in-law of Miss Gooch; he is a very agreeable person, & has actually come all this distance as a Tour: he intends going by land to Lima & so by Mexico back to Europe. Very few fine gentlemen undertake such a tour as this. I forget whether I mentioned that during our previous stay at M. Video, Mr Hamond joined us – He is a relation of poor little Musters & a very nice gentleman-like person. We were generally companions on shore; our chief amusement was riding about & admiring the Spanish ladies. After watching one of these angels gliding down the streets; involuntarily we groaned out, 'how foolish English women are, they can neither walk nor dress.' And then how ugly Miss sounds after Signorita; I am sorry for you all; it would do the whole tribe of you a great deal of good to come to Buenos Ayres.

November 14th – M: Video. I have just been again delighted with an unexpected stock of letters. One from Catherine July 25, from Susan August 15th from Erasmus 18th. These two last I owe to the change of time of sending them from the Tuesdays to the Fridays. As it is a special favor, thanks, dear old Erasmus for writing to me & doing all my various commissions – I am sorry the books turn out so expensive & not to be procured. I only knew them from references: of



course any travels by those employed in Nat: History are preeminently interesting to me. I am become quite devoted to Nat: History, you cannot imagine what a fine miserlike pleasure I enjoy, when examining an animal differing widely from any known genus. No schoolboy ever opened a box of plumcake, so eagerly as I shall mine, but it is a pleasure which will not come for the next 9 months. I am glad the journal arrived safe; as for showing it, I leave that entirely in your hands. I suspect the first part is abominably childish, if so do not send it to Maer. Also, do not send it by the Coach, (it may appear *ridiculous* to you) but I would as soon loose a piece of my memory as it. I feel it is of such consequence to my preserving a just recollection of the different places we visit. When I get another good opportunity I will send some more. The Beagle is in a state of wonderful bustle & confusion – there is not a corner, even to the officers cabins where food is not stored. The Captain seems determined, that this, at least shall not call us back. I look forward with a good deal of interest to Terra del; there are plenty of good anchorages; so that it may blow great guns if it likes, & we can laugh at it. Anything must be better, than this detestable Rio Plata. I would much sooner live in a coal-barge in the Cam.

Hurrah, (Nov 24th), have just received the box of valuable[s]. Thank everybody who has had a finger in it, & Erasmus for packing them all up so well: Neither the Captain or myself have received (from some change in packets) any letters – I should have like[d] to have heard once again that you are all well & safe before my long absence, I may say from this world. At Buenos Ayres I drew 20£ for myself & here Cap FitzRoy asked me if I could pay one year in advance for my mess. I did so, for I could not, although, perhaps I ought, refuse to a person who is so systematically munificent to everyone who approaches him. So that now (one year being gone) am as at first starting two years in advance. Having drawn . . . [end of letter lost]

*Darwin and Beagle* pp.75–9

C.D. TO PROFESSOR HENSLOW

Monte Video 24 Nov 1832

My dear Henslow,

We arrived here on the 24th of Octob: after our first cruize on the coast of Patagonia: North of the Rio Negro we fell in with some little Schooners employed in sealing; to save the loss of time in surveying the intricate mass of banks, Capt. FitzRoy has hired two of them & has put officers in them. It took us nearly a month fitting them out; as soon as this was finished we came back here, & are now preparing for a long cruize to the South. I expect to find the wild mountainous country of Terra del very interesting; & after the coast of Patagonia I shall thoroughly enjoy it. I had hoped for the credit of dame Nature, no such country as this last existed; in sad reality we coasted along 240 miles of sand hillocks; I never knew before, what a horrid ugly object a sand hillock is. The famed country of the Rio Plata in my opinion is not much better; an enormous brackish river bounded by an interminable green plain, is enough to make any naturalist groan. So hurrah for Cape Horn & the land of storms.



Now that I have had my growl out, which is a privilege *sailors* take on all occasions, I will turn the tables & give an account of my doings in Nat: History. I must have one more growl, by ill luck the French government has sent one of its Collectors to the Rio Negro, where he has been working for the last six months, & is now gone round the Horn. So that I am very selfishly afraid he will get the cream of all the good things before me. As I have nobody to talk to about my luck & ill luck in collecting, I am determined to vent it all upon you. I have been very lucky with fossil bones; I have fragments of at least 6 distinct animals; as many of them are teeth, I trust, shattered & rolled as they have been, they will be recognised. I have paid *all the attention*, I am *capable* of, to their geological site; but of course it is too long a story for here. 1st the Tarsi & metatarsi very perfect of a cavia. 2nd the upper jaw & head of some very large animal with 4 square hollow molars – & the head greatly produced in front. I at first thought it belonged either to the Megalonyx or Megatherium – in confirmation of this, in the same formation I found a large surface of the osseous polygonal plates, which ‘late observations’ (what are they?) show belong to the Megatherium. Immediately I saw them I thought they must belong to an enormous Armadillo, living species of which genus are so abundant here. 3rd The lower jaw of some large animal, which from the molar teeth I should think belonged to the Edentata. 4th some large molar teeth, which in some respects would seem to belong to an enormous Rodentia; 5th, also some smaller teeth belonging to the same order: etc etc. If it interests you sufficiently to unpack them, I shall be *very curious* to hear something about them – *Care must be taken*, in this case, not to confuse the tallies. They are mingled with marine shells, which appear to me identical with what now exist. But since they were deposited in their beds, several geological changes have taken place in the country.

So much for the dead & now for the living. There is a poor specimen of a bird, which to my unornithological eyes, appears to be a happy mixture of a lark pidgeon & snipe (No. 710). Mr Mac Leay himself never imagined such an inosculating creature. I suppose it will turn out to be some wellknow[n] bird, although it has quite baffled me. I have taken some interesting amphibia; a fine Bipes; a new Trigonocephalus beautifully connecting in its habits Crotalus & Viperus: & plenty of new (as far as my knowledge goes) Saurians. As for one little toad; I hope it may be new, that it may be christened ‘diabolicus’. Milton must allude to this very individual, when he talks of ‘squat like [a] toad’, its colours are by Werner, *ink black, Vermilion red & buff orange*.

It has been a splendid cruize for me in Nat: History. Amongst the pelagic Crustaceae, some new & curious genera. In the Zoophites some interesting animals – as for one Flustra, if I had not the specimen to back me up, nobody would believe in its most anomolous structure. But as for novelty all this is nothing to a family of pelagic animals; which at first sight appear like Medusa, but are really highly organized. I have examined them repeatedly, & certainly from their structure, it would be impossible to place them in any existing order. Perhaps Salpa is the nearest animal; although the transparency of the body is nearly the only character they have in common. All this may be said of another





This is a partially finished sketch, & the whole is subject to alteration with additions & omissions.

PART OF  
**TIERRA DEL FUEGO**  
from  
H.M.S. Beagle  
1834

Note. *Water Land* from H.M.S. *Challenger*  
and part of the Strait of Magellan  
from H.M.S. *Adventure*.

It is high water in the Strait of Le Maire at five  
but the flood tide continues to run northward until  
about six P.M. on the day of new moon. The flood  
tide is much stronger than the ebb along all this  
coast and it sets from the Westward but Northward  
of Staten Island and the Strait of Le Maire the flood  
tide runs North westward.

Although five and six are the average times the tides  
vary much being sometimes nearly an hour earlier &  
sometimes as much later on the day of full or  
new moon.



animal, although of a much simpler structure. I think the dried plants nearly contain all which were then, Bahia Blanca, flowering. All the specimens will be packed in casks – I think there will be three (before sending this letter I will specify dates, etc etc). I am afraid you will groan or rather the floor of the Lecture room will, when the casks arrive. Without you I should be utterly undone. The small cask contains fish; will you open it to see how the spirit has stood the evaporation of the Tropics.

On board the Ship everything goes on as well as possible, the only drawback is the fearful length of time between this & day of our return. I do not see any limits to it: one year is nearly completed & the second will be so before we even leave the East coast of S America. And then our voyage may be said really to have commenced. I know not, how I shall be able to endure it. The frequency with which I think of all the happy hours I have spent at Shrewsbury & Cambridge, is rather ominous. I trust everything to time & fate & will feel my way as I go on.

NOV. 24th. We have been at Buenos Ayres for a week. It is a fine large city; but such a country; everything is mud: you can go no where, you can do nothing for mud. In the city [I] obtained much information about the banks of the Uruguay. I hear of Limestone with shells, & beds of shells in every direction. I hope when we winter in the Plata to have a most interesting Geological excursion in that country. I purchased fragments (Nors : 837 & 8) of some enormous bones; which I was assured belonged to the former giants!! I also procured some seeds. I do not know whether they are worth your accepting; if you think so, I will get some more: they are in the box I have sent to you by the Duke of York Packet, commanded by Lieu: Snell to Falmouth – two large casks, containing fossil bones, a small cask with fish, & a box containing skins, spirit bottle etc & pill-boxes with beetles. Would you be kind enough as to open these latter, as they are apt to become mouldy. With the exceptions of the bones, the rest of my collection looks very scanty. Recollect how great a proportion of time is spent at sea. I am always anxious to hear in what state my things come & any criticisms about quantity or kind of specimens. In the smaller cask is part of a large head, the anterior portions of which are in the other large one. The packet has arrived & I am in a great bustle: you will not hear from me for some months: Till then believe me, my dear Henslow,

Yours very truly obliged,  
Chas Darwin.

Remember me most kindly to Mrs Henslow.

*Darwin & Henslow* pp.60-4

The *Beagle* left Montevideo on November 27th, to keep a rendezvous a week later with Lieutenant Wickham's two schooners in the bay of St Blas, on the coast some distance south of Bahia Blanca.

In other respects all had prospered so well, that I determined to give Mr Wickham fresh orders, enlarging considerably his share of surveying operations. He was desired to continue exploring the coast, even as far as Port Desire, until the



Beagle's return from her visit to Tierra del Fuego and the Falkland Islands.

As the weather promised well, an anchor was dropped where we were, outside the banks, but the schooners sought shelter in the harbour of San Blas. Next day they came out and anchored close to us, in order to receive stores and various supplies which we had brought for them from Buenos Ayres and Monte Video. I was a little uneasy when I saw that the pilot of the *Liebre*, Mr Roberts, was one of the largest of men, and that his little vessel looked, by comparison, no bigger than a coffin; but Mr Wickham allayed my doubts by assuring me that his moveable weight answered admirably in trimming the craft; and that, when she got a-ground, Mr Roberts stepped overboard, and heaved her afloat. 'Certainly,' said Mr Wickham, 'he did harm on one day, by going up to look-out, and breaking the mast.'

In the afternoon of this day (4th) we weighed anchor and parted company from the *Paz* and *Liebre*. They returned to San Blas, and the *Beagle* steered southward. Secure and capacious as is the port just mentioned, it is one of the most difficult and dangerous to enter on this coast. The best, indeed only approach to it, is called by those sealers and sea-elephant fishers who have hitherto frequented it, 'Hell-gate'.

At about four the weather was very hot, the sky cloudless, and varying flaws of wind drove quantities of gossamer, and numbers of insects off from the land. The horizon was strangely distorted by refraction, and I anticipated some violent change. Suddenly myriads of white butterflies surrounded the ship, in such multitudes, that the men exclaimed, 'it is snowing butterflies.' They were driven before a gust from the north-west, which soon increased to a double-reefed topsail breeze, and were as numerous as flakes of snow in the thickest shower. The space they occupied could not have been less than two hundred yards in height, a mile in width, and several miles in length.

*Narrative* 2 pp. 116-17

The *Beagle* sailed south along the coast of Patagonia, past the Strait of Magellan, until the land of Tierra del Fuego was sighted near Cape St Sebastian. On December 17th she anchored in Good Success Bay, opposite Staten Island on the Fuegian side of the Strait of Le Maire. The following morning, FitzRoy and Darwin went ashore, accompanied among others by the Fuegian Jemmy Button and the missionary, Richard Matthews, who was later to be left with the Fuegians when they were restored to their own tribe.

18th. Mr Darwin, Mr Hamond and others, went with me to the natives who had so vociferously greeted our arrival; and deeply indeed was I interested by witnessing the effect caused in their minds by this first meeting with man in such a totally savage state.

There were five or six stout men, half-clothed in guanaco-skins, almost like the Patagonians in aspect and stature, being near six feet high, and confident in demeanour. They scarcely bore resemblance to the Fuegians, except in colour and class of features. I can never forget Mr Hamond's earnest expression, 'What a pity such fine fellows should be left in such a barbarous state!' It told me that a desire



to benefit these ignorant, though by no means contemptible human beings, was a natural emotion, and not the effect of individual caprice or erroneous enthusiasm; and that his feelings were exactly in unison with those I had experienced on former occasions, which had led to my undertaking the heavy charge of those Fuegians whom I brought to England.

Disagreeable, indeed painful, as is even the mental contemplation of a savage, and unwilling as we may be to consider ourselves even remotely descended from human beings in such a state, the reflection that Caesar found the Britons painted and clothed in skins, like these Fuegians, cannot fail to augment an interest excited by their childish ignorance of matters familiar to civilized man, and by their healthy, independent state of existence. One of these men was just six feet high, and stout in proportion; the others were rather shorter: their legs were straight and well formed, not cramped and misshapen, like those of the natives who go about in canoes; and their bodies were rounded and smooth. They expressed satisfaction or good will by rubbing or patting their own, and then our bodies; and were highly pleased by the antics of a man belonging to the boat's crew, who danced well and was a good mimic. One of the Fuegians was so like York Minster, that he might well have passed for his brother. He asked eagerly for 'cuchillo'. About his eyes were circles of white paint, and his upper lip was daubed with red ochre and oil. Another man was rubbed over with black. They were (apparently) very good-humoured, talked and played with the younger ones of our party, danced, stood up back to back with our tallest men to compare heights, and began to try their strength in wrestling – but this I stopped. It was amusing and interesting to see their meeting with York and Jemmy, who would not acknowledge them as countrymen, but laughed at and mocked them. It was evident that both of our Fuegians understood much of the language in which the others talked; but they would not try to interpret, alleging that they did not know enough. York betrayed this by bursting into an immoderate fit of laughter at something the oldest man told him, which he could not resist telling us was, that the old man said he was dirty, and ought to pull out his beard. Now, if their language differed much from that of York Minster, or was indeed other than a dialect of the same original, it is not probable that York could have understood the old man's meaning so readily when he spoke quietly, without signs.

Richard Matthews was with us, but did not appear to be at all discouraged by a close inspection of these natives. He remarked to me, that 'they were no worse than he had supposed them to be'.

*Narrative* 2 pp. 120–2

DEC. 18th. The Captain sent a boat with a large party of officers to communicate with the Fuegians. As soon as the boat came within hail, one of the four men who advanced to receive us began to shout most vehemently, & at the same time pointed out a good landing place. The women & children had all disappeared. When we landed the party looked rather alarmed, but continued talking & making gestures with great rapidity. It was without exception the most curious & interesting spectacle I ever beheld. I would not have believed how entire the





*Fuegian of the Yapoo Tekeenica tribe*



difference between savage & civilized man is. It is greater than between a wild & domesticated animal, in as much as in man there is greater power of improvement. The chief spokesman was old & appeared to be head of the family; the three others were young powerful men & about 6 feet high. From their dress &c. &c, they resembled the representations of Devils on the Stage, for instance in *Der Freischutz*. The old man had a white feather cap, from under which, black long hair hung round his face. The skin is dirty copper colour. Reaching from ear to ear & including the upper lip, there was a broad red coloured band of paint; & parallel & above this, there was a white one; so that the eyebrows & eyelids were even thus coloured. The only garment was a large guanaco skin with the hair outside. This was merely thrown over their shoulders, one arm & leg being bare; for any exercise they must be absolutely naked. Their very attitudes were abject, & the expression distrustful, surprised & startled. Having given them some red cloth, which they immediately placed round their necks, we became good friends. This was shown by the old man patting our breasts & making something like the same noise which people do when feeding chickens. I walked with the old man & this demonstration was repeated between us several times. At last he gave me three hard slaps on the breast & back at the same time, & making most curious noises. He then bared his bosom for me to return the compliment, which being done, he seemed highly pleased. Their language does not deserve to be called articulate. Capt. Cook says it is like a man clearing his throat; to which may be added another very hoarse man trying to shout & a third encouraging a horse with that peculiar noise which is made in one side of the mouth. Imagine these sounds & a few gutturals mingled with them, & there will be as near an approximation to their language as any European may expect to obtain. Their chief anxiety was [to] obtain knives; this they showed by pretending to have blubber in their mouths & cutting instead of tearing it from the body: they called them in a continued plaintive tone *cuchilla* – probably a corruption from a Spanish word. They are excellent mimics, if you cough or yawn or make any odd motion they immediately imitate you. Some of the officers began to squint & make monkey like faces; but one of the young men, whose face was painted black with white band over his eyes, was most successful in making still more hideous grimaces. When a song was struck up, I thought they would have fallen down with astonishment; & with equal delight they viewed our dancing and immediately began themselves to waltz with one of the officers. They knew what guns were & much dreaded them, & nothing would tempt them to take one in their hands. Jemmy Button came in the boat with us; it was interesting to watch their conduct to him. They immediately perceived the difference & held much conversation between themselves on the subject. The old man then began a long harangue to Jemmy, who said it was inviting him to stay with them; but the language is rather different & Jemmy could not talk to them. If their dress & appearance is miserable, their manner of living is still more so. Their food chiefly consists in limpets & muscles, together with seals & a few birds; they must also catch occasionally a Guanaco. They seem to have no property excepting bows & arrows & spears. Their present residence is under a few bushes by a ledge of rock:





### *Fuegians*

it is no ways sufficient to keep out rain or wind; & now in the middle of summer it daily rains & as yet each day there has been some sleet. The almost impenetrable wood reaches down to high water mark; so that the habitable land is literally reduced to the large stones on the beach; & here at low water, whether it may be night or day, these wretched looking beings pick up a livelihood. I believe if the world was searched, no lower grade of man could be found. The Southsea Islanders are civilized compared to them, & the Esquimaux, in subterranean huts, may enjoy some of the comforts of life. After dinner the Captain paid the Fuegians another visit. They received us with less distrust & brought with them their timid children. They noticed York Minster, (who accompanied us) in the same manner as Jemmy, & told him he ought to shave, & yet he has not 20 hairs on his face, whilst we all wear our untrimmed beards. They examined the color of his skin; & having done so, they looked at ours. An arm being bared, they expressed the liveliest surprise & admiration. Their whole conduct was such an odd mixture of astonishment & imitation, that nothing could be more laughable & interesting. The tallest man was pleased with being examined & compared with a tall sea-man, in doing this he tried his best to get on rather higher ground & to stand on tiptoes. He opened his mouth to show his teeth & turned his face en profil; for the rest of



his days doubtless he will be the beau ideal of his tribe. Two or three of the officers, who are both fairer & shorter than the others (although possessed of large beards) were, we think, taken for ladies. I wish they would follow our supposed example & produce their 'squaws'. In the evening we parted very good friends; which I think was fortunate, for the dancing & 'sky-larking' had occasionally bordered on a trial of strength.

*Diary* pp. 118-21

On December 21st the *Beagle* sailed on to the south, but after rounding Cape Horn the next day ran into bad weather, forcing her to seek shelter in Wigwam Cove, to the west and a little north of Cape Horn. There Christmas was spent.

DEC. 24th. In the morning of the 24th Cape Horn was on our weather bow. We now saw this notorious point in its proper form, veiled in a mist & its dim outline surrounded by a storm of wind & water. Great black clouds were rolling across the sky & squalls of rain & hail swept by us with very great violence: so that the Captain determined to run into Wigwam cove. This harbor is a quiet little basin behind Cape Spencer & not far from Cape Horn. And here we are in quite smooth water; & the only thing which reminds us of the gale which is blowing outside, is the heavy puffs or Whyllywaws, which every 5 minutes come over the mountains, as if they would blow us out of the water.

25th. This being Christmas day, all duty is suspended, the seamen look forward to it as a great gala day; & from this reason we remained at anchor. Wigwam Cove is in Hermit Island; its situation is pointed out by Kater's Peak, a steep conical mountain 1700 feet high, which arises by the side of, & overlooks the bay. Sullivan, Hamond & myself started after breakfast to ascend it; the sides were very steep so [as] to make the climbing very fatiguing, & parts were thick with the Antarctic Beech. From the summit a good geographical idea might be obtained of the surrounding isles & distant main land. These islands would appear to be the termination of the chain of the Andes; the mountain tops only being raised above the ocean. Whilst looking round on this inhospitable region we could scarcely credit that man existed on it. On our return on board, we were told we had been seen from the ship. This we knew to be impossible, as the *Beagle* is anchored at the mouth of the harbor & close under a lofty peak, behind which is Kater's. As it was certain men had been seen crawling over the rock on this hill, they must have been Fuegians. From their position, all our parties were in view; & what must have been their feelings of astonishment – the whole of Wigwam Cove resounded with guns fired in the Caverns at the Wild fowl; we three also screaming to find out echos; Sullivan amusing himself by rolling down the precip[ic]les huge stones, & I impetuously hammering with my geological tools the rocks. They must have thought us the powers of darkness; or whatever else, fear has kept them concealed, Wigwam Cove has frequently been visited; it was named by Mr Waddell. The Chanticleer, with Capt. Forster remained here some months; the remains of the tent where he swung the Pendulum exist yet.

The sky looked ominous at sunset; & in the middle of the night, the hands were





*Fuegians at the entrance to the Beagle Channel*

turned up to let go another anchor, for it blew a tremendous gale.

*Diary pp. 124-5*

DEC. 27th, 28th & 29th. To our great loss, the weather during these three days has been very bad, with much rain & violent squalls from the S.W. Yesterday the Captain went to reconnoitre the bays formed by the many islands at the back of Hermit's. I accompanied him, but the weather is so bleak & raw, as to render boating rather disagreeable. We ascended some of the hills, which as usual, showed us the nakedness of the land.

In most of the coves there were wigwams; some of them had been recently inhabited. The wigwam or Fuegian house is in shape like a cock of hay, about 4 feet high & circular; it can only be the work of an hour, being merely formed of a few branches & imperfectly thatched with grass, rushes &c. As shell fish, the chief source of subsistence, are soon exhausted in any one place, there is a constant necessity for migrating; & hence it comes that these dwellings are so very miserable. It is however evident that the same spot at intervals, is frequented for a succession of years. The wigwam is generally built on a hillock of shells & bones, a large mass weighing many tons. Wild celery, Scurvy-grass, & other plants invariably grow on this heap of manure, so that by the brighter green of the vegetation the site of a wigwam is pointed out even at a great distance.



The sea is here tenanted by many curious birds, amongst which the Steamer is remarkable; this [is] a large sort of goose, which is quite unable to fly, but uses its wings to flapper along the water; from thus beating the water it takes its name. Here also are many Penguins, which in their habits are like fish, so much of their time do they spend under water, & when on the surface they show little of their bodies excepting the head; their wings are merely covered with short feathers. So that there are three sorts of birds which use their wings for more purposes than flying; the Steamer as paddles, the penguin as fins, & the Ostrich spreads its plumes like sails to the breeze.

*Diary* pp. 125-6

In better weather, the *Beagle* set sail again on December 31st, FitzRoy's intention being to leave the Fuegians York Minster and Fuegia Basket with their people on the shores of Christmas Sound, and to return eastward through Beagle Channel in order to complete an earlier survey. However, continued south-westerly gales dictated otherwise.

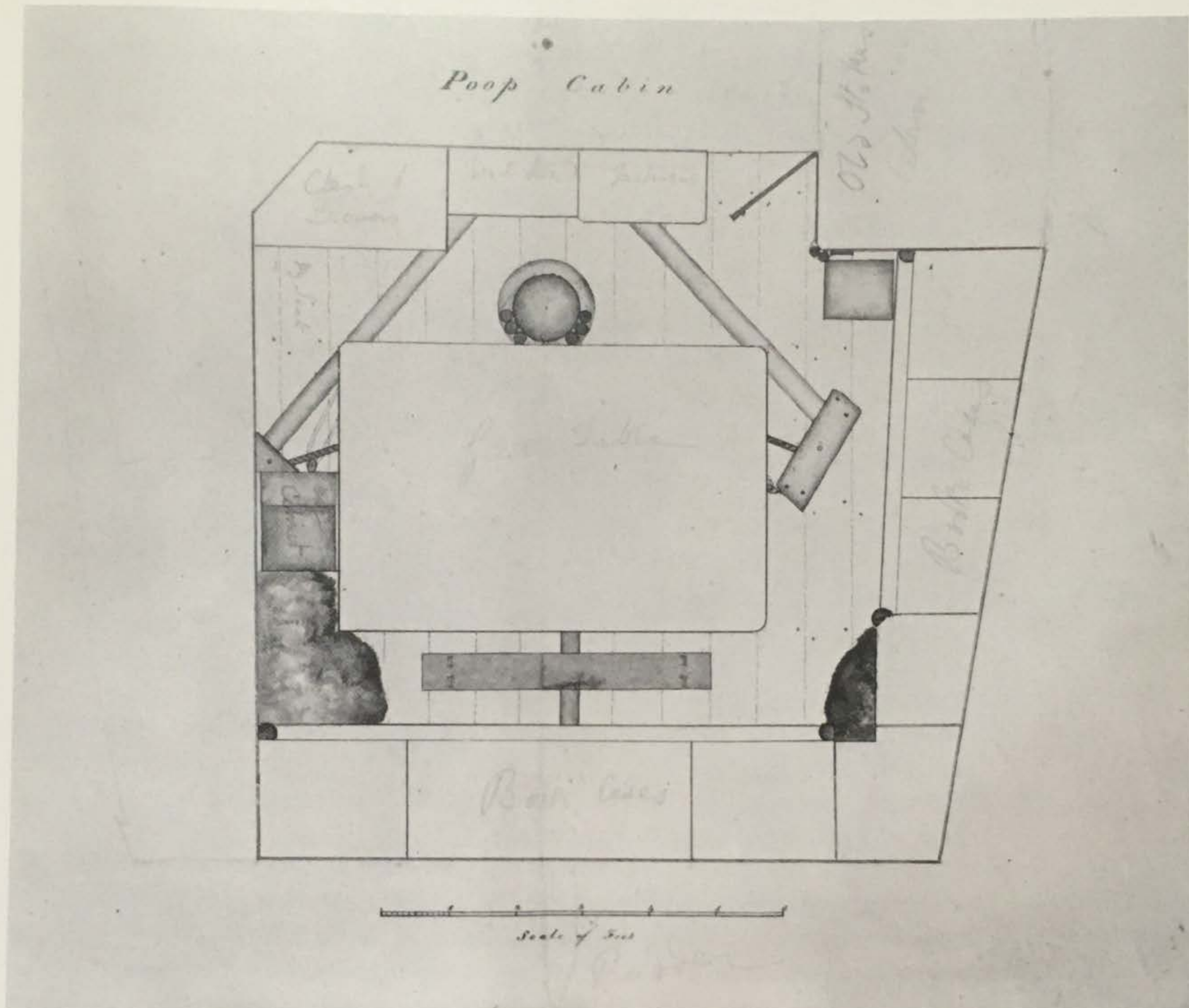
On the 11th [January] we saw that wild-looking height, called York Minster, 'looming' among driving clouds, and I flattered myself we should reach an anchorage; but after tearing through heavy seas, under all the sail we could carry, darkness and a succession of violent squalls, accompanied by hail and rain, obliged me to stand to seaward, after being within a mile of our port. All the next day we were lying-to in a heavy gale - wearing occasionally.

At three in the morning of the 13th, the vessel lurched so deeply, and the main-mast bent and quivered so much, that I reluctantly took in the main-topsail (small as it was when close-reefed), leaving set only the the storm-trysails (close-reefed) and fore-staysail. At ten, there was so continued and heavy a rush of wind, that even the diminutive trysails oppressed the vessel too much, and they were still farther reduced. Soon after one, the sea had risen to a great height, and I was anxiously watching the successive waves, when three huge rollers approached, whose size and steepness at once told me that our sea boat, good as she was, would be sorely tried. Having steerage way, the vessel met and rose over the first unharmed, but, of course, her way was checked; the second deadened her way completely, throwing her off the wind; and the third great sea, taking her right a-beam, turned her so far over, that all the lee bulwark, from the cat-head to the stern davit, was two or three feet under water.

For a moment, our position was critical; but, like a cask, she rolled back again, though with some feet of water over the whole deck. Had another sea then struck her, the little ship might have been numbered among the many of her class which have disappeared: but the crisis was past - she shook the sea off her through the ports, and was none the worse - excepting the loss of a lee-quarter boat, which, although carried three feet higher than in the former voyage (1826-1830), was dipped under water, and torn away.

*Narrative* 2 pp. 125-6





*Lay-out of the poop cabin of the 'Beagle'*

With the loss of a whale boat, and some damage to Darwin's specimens in the poop cabin, the *Beagle* anchored in Goree Road, at the eastern end of the Beagle Channel, on January 15th.

JAN. 18th. Having moored the *Beagle* in security, and made arrangements for the occupation of those who were to remain on board, I set out with four boats (yawl and three whale-boats), carrying Matthews and the Fuegians, with all the stock of useful things which had been given to them in England. A temporary deck having been put upon the yawl, she carried a large cargo, and was towed by the other boats when the wind was adverse. Matthews showed no sign of hesitation or reluctance; on the contrary, he was eager to begin the trial to which he had been so long looking forward. Messrs Darwin, Bynoe, Hamond, Stewart, and Johnson, with twenty-four seamen and marines, completed the party.



My intention was to go round the north-east part of Navarin Island, along the eastern arm of the Beagle Channel, through Murray Narrow, to the spot which Jemmy called his country: there establish the Fuegians, with Matthews: leave them for a time, while I continued my route westward to explore the western arms of the channel, and part of Whaleboat Sound: and at my return thence decide whether Matthews should be left among the natives for a longer period, or return with me to the Beagle.

*Narrative* 2 pp. 127-8

JAN. 19th. In the morning three whale-boats & the Yawl started with a fair wind. We were 28 in number & the yawl carried the outfit given to Matthews by the missionary society. The choice of articles showed the most culpable folly & negligence. Wine glasses, butter-bolts, tea trays, soup turins, mahogany dressing case, fine white linen, beavor hats & an endless variety of similar things, shows how little was thought about the country where they were going to. The means absolutely wasted on such things would have purchased an immense stock of really useful articles. Our course lay towards the Eastern entrance of the Beagle Channel & we entered it in the afternoon. The scenery was most curious & interesting; the land is indented with numberless coves & inlets, & as the water is always calm, the trees actually stretch their boughs over the salt water. In our little fleet we glided along, till we found in the evening a corner snugly concealed by small islands. Here we pitched our tents & lighted our fires. Nothing could look more romantic than this scene; the glassy water of the cove & the boats at anchor; the tents supported by the oars, & the smoke curling up the wooded valley formed a picture of quiet & retirement.

20th. We began to enter to day the part of the country which is thickly inhabited. As the channel is not generally more than three or 4 miles broad, the constant succession of fresh objects quite takes away the fatigue of sitting so many hours in one position. The Beagle Channel was first discovered by Capt. FitzRoy during the last voyage, so that it is probable the greater part of the Fuegians had never seen Europaeans. Nothing could exceed their astonishment at the apparition of our four boats; fires were lighted on every point to attract our attention & spread the news. Many of the men ran for some miles along the shore. I shall never forget how savage & wild one group was. Four or five men suddenly appeared on a cliff near to us; they were absolutely naked & with long streaming hair. Springing from the ground & waving their arms around their heads, they sent forth most hideous yells. Their appearance was so strange, that it was scarcely like that of earthly inhabitants. We landed at dinner time; the Fuegians were not at first inclined to be friendly, for till one boat pulled in before the others, they kept their slings in readiness. We soon delighted them by trifling presents such as tying red tape round the forehead; it is very easy to please, but as difficult to make them content; the last & first word is sure to be 'yammerschooner' which means 'give me'. At night we in vain endeavoured to find an uninhabited cove; the natives being few in number were quiet & inoffensive. (21st.) In the morning however, a fresh party having arrived, they became troublesome; some of the men picked up





### *Fuegians*

stones & the women & children retreated; I was very much afraid we should have had a skirmish; it would have been shocking to have fired on such naked miserable creatures. Yet their stones & slings are so destructive that it would have been absolutely necessary. In treating with savages, Europaeans labor under a great disadvantage untill the cruel lesson is taught, how deadly firearms are. Several times when the men have been tired & it was growing dark, all the things have been packed up to remove our quarters; & this solely from our entire inability to frighten the natives. One night the Captain fired double barrellled pistols close to their faces, but they only rubbed their heads, & when he flourished his cutlass, they were amused & laughed. They are such thieves & so bold cannabals that one naturally prefers separate quarters.

The country on each side of the channel continues much the same; slate hills, thickly clothed by the beech woods, run nearly parallel to the water. The low point of view from a boat & the looking along one valley & thus loosing the beautiful succession of rides, is nearly destructive to picturesque effect.

22nd. After an unmolested night in what would appear to be neutral ground between the people we saw yesterday & Jemmy's, we enjoyed a delightful pull through the calm water. The Northern mountains have become more lofty & jagged. Their summits are partially covered with snow & their sides with dark woods; it was very curious to see as the eye ranged, how *exact* & truly horizontal



the line was at which trees ceased to grow. It precisely resembled on a beach the high water mark of drift sea-weed. At night we arrived at the junction with Ponsonby Sound; we took up our quarters with a family belonging to Jemmy's, or the *Tekenika* people. They were quiet & inoffensive & soon joined the seamen round a blazing fire. Although naked they streamed with perspiration at sitting so near to a fire, which we found only comfortable. They attempted to join Chorus with the songs, but the way in which they were always behind hand was quite laughable. A canoe had to be despatched to spread the news & in the morning a large gang arrived.

*Diary* pp. 129-31

JAN. 23rd. While embarking our tents and cooking utensils, several natives came running over the hills towards us, breathless with haste, perspiring violently, and bleeding at the nose. Startled at their appearance, we thought they had been fighting; but it appeared in a few moments, that having heard of our arrival, they lost not a moment in hurrying across the hills from a place near Woollya, and that the bloody noses which had surprised us were caused by the exertion of running. This effect has been noticed among the New Hollanders, I believe the islanders of the Pacific Ocean, as well as the Esquimaux, and probably others; but to our party it was then a novelty, and rather alarming.

Scarcely had we stowed the boats and embarked, before canoes began to appear in every direction, in each of which was a stentor hailing us at the top of his voice. Faint sounds of deep voices were heard in the distance, and around us echoes to the shouts of our nearer friends began to reverberate, and warned me to hasten away before our movements should become impeded by the number of canoes which I knew would soon throng around us. Although now among natives who seemed to be friendly, and to whom Jemmy and York contrived to explain the motives of our visit, it was still highly necessary to be on our guard. Of those men and boys who ran over the hills to us, all were of Jemmy's tribe excepting one man, whom he called an Oens-man; but it was evident, from his own description, that the man belonged to the Yapoo, or eastern Tekeenica tribe, and was living in safety among his usual enemies, as a hostage for the security of a man belonging to Jemmy's tribe who was staying among the eastern people.

As we steered out of the cove in which our boats had been sheltered, a striking scene opened: beyond a lake-like expanse of deep blue water, mountains rose abruptly to a great height, and on their icy summits the sun's early rays glittered as if on a mirror. Immediately round us were mountainous eminences, and dark cliffy precipices which cast a very deep shadow over the still water beneath them. In the distant west, an opening appeared where no land could be seen; and to the south was a cheerful sunny woodland, sloping gradually down to the Murray Narrow, at that moment almost undistinguishable. As our boats became visible to the natives, who were eagerly paddling towards the cove from every direction, hoarse shouts arose, and, echoed about by the cliffs, seemed to be a continual cheer. In a very short time there were thirty or forty canoes in our train, each full of natives, each with a column of blue smoke rising from the fire amidships, and



*Fuegians*

almost all the men in them shouting at the full power of their deep sonorous voices. As we pursued a winding course around the bases of high rocks or between islets covered with wood, continual additions were made to our attendants; and the day being very fine, without a breeze to ruffle the water, it was a scene which carried one's thoughts to the South Sea islands, but in Tierra del Fuego almost appeared like a dream. After a few hours (pulling hard to keep a-head of our train) we reached Woollya, and selected a clear space favourably situated for our encampment, landed, marked a boundary-line, placed sentries, and made the various arrangements necessary for receiving the anticipated visits of some hundred natives. We had time to do all this quietly, as our boats had distanced their pursuers several miles, while running from the Murray Narrow before a favourable breeze which sprung up, and, to our joy, filled every sail.

We were much pleased by the situation of Woollya, and Jemmy was very proud of the praises bestowed upon his land. Rising gently from the water-side, there are considerable spaces of clear pasture land, well watered by brooks, and backed by hills of moderate height, where we afterwards found woods of the finest timber trees in the country. Rich grass and some beautiful flowers, which none of us had ever seen, pleased us when we landed, and augured well for the growth of our garden seeds.



At our first approach, only a few natives appeared, who were not of Jemmy's family. The women ran away and hid themselves, but Jemmy and York contrived (with difficulty) to make the men comprehend the reason of our visit; and their awkward explanation, helped by a few presents, gradually put them at ease. They soon understood our meaning when we pointed to the boundary-line which they were not to pass. This line was on the shore between our tents and the grassland; immediately behind the tents was a good landing-place, always sheltered, where our boats were kept in readiness in case of any sudden necessity.

Soon after our arrangements were made, the canoes which had been following us began to arrive; but, much to my satisfaction, the natives landed in coves at some distance from us, where the women remained with the canoes while the men and boys came overland to our little camp. This was very favourable for us, because it divided their numbers and left our boats undisturbed. We had only to guard our front, instead of being obliged to look out all round, as I had expected; and really it would have been no trifling affair to watch the pilfering hands and feet of some hundred natives, while many of our own party (altogether only thirty in number) were occupied at a distance, cutting wood, digging ground for a garden, or making wigwams for Matthews, York, and Jemmy.

As the natives thronged to our boundary-line (a mere mark made with a spade on the ground), it was at first difficult to keep them back without using force; but by good temper on the part of our men, by distributing several presents, and by the broken Fuegian explanations of our dark-coloured shipmates, we succeeded in getting the natives squatted on their hams around the line, and obtaining influence enough over them to prevent their encroaching.

Canoes continued to arrive; their owners hauled them ashore on the beach, sent the women and children to old wigwams at a little distance, and hastened themselves to see the strangers. While I was engaged in watching the proceedings at our encampment, and poor Jemmy was getting out of temper at the quizzing he had to endure on account of his countrymen, whom he had extolled so highly until in sight, a deep voice was heard shouting from a canoe more than a mile distant: up started Jemmy from a bag full of nails and tools which he was distributing, leaving them to be scrambled for by those nearest, and, upon a repetition of the shout, exclaimed 'My brother!' He then told me that it was his eldest brother's voice, and perched himself on a large stone to watch the canoe, which approached slowly, being small and loaded with several people. When it arrived, instead of an eager meeting, there was a cautious circumspection which astonished us. Jemmy walked slowly to meet the party, consisting of his mother, two sisters, and four brothers. The old woman hardly looked at him before she hastened away to secure her canoe and hide her property, all she possessed – a basket containing tinder, firestone, paint, &c., and a bundle of fish. The girls ran off with her without even looking at Jemmy; and the brothers (a man and three boys) stood still, stared, walked up to Jemmy, and all round him, without uttering a word. Animals when they meet show far more animation and anxiety than was displayed at this meeting. Jemmy was evidently much mortified, and to add to his confusion and disappointment, as well as my own, he was unable to talk to his



brothers, except by broken sentences, in which English predominated. After a few minutes had elapsed, his elder brother began to talk to him; but although Jemmy understood what was said, he could not reply. York and Fuegia were able to understand some words, but could not or did not choose to speak.

This first evening of our stay at Woollya was rather an anxious one; for although the natives seemed inclined to be quite friendly, and they all left us at sunset, according to their invariable practice, it was hard to say what mischief might not be planned by so numerous a party, fancying, as they probably would, that we were inferior to them in strength, because so few in number. Jemmy passed the evening with his mother and brothers, in their wigwam, but returned to us to sleep. York, also, and Fuegia were going about among the natives at their wigwams, and the good effect of their intercourse and explanations, such as they were, was visible next day (24th) in the confident, familiar manner of the throng which surrounded us while we began to dig ground for gardens, as well as cut wood for large wigwams, in which Matthews and his party were to be established. Canoes still arrived, but their owners seemed as well-disposed as the rest of the natives, many of whom assisted us in carrying wood, and bringing bundles of grass or rushes to thatch the wigwams which they saw we were making, in a pleasant sheltered spot, near a brook of excellent water. One wigwam was for Matthews, another for Jemmy, and a third for York and Fuegia. York told me that Jemmy's brother was 'very much friend', that the country was 'very good land', and that he wished to stay with Jemmy and Matthews.

A small plot of ground was selected near the wigwams, and, during our stay, dug, planted and sowed with potatoes, carrots, turnips, beans, peas, lettuce, onions, leeks, and cabbages. Jemmy soon clothed his mother and brothers, by the assistance of his friends. For a garment which I sent the old woman she returned me a large quantity of fish, all she had to offer; and when she dressed, Jemmy brought her to see me. His brothers speedily became rich in old clothes, nails and tools, and the eldest were soon known among the seamen as Tommy Button and Harry Button, but the younger ones usually staid at their wigwams, which were about a quarter of a mile distant. So quietly did affairs proceed, that the following day (25th) a few of our people went on the hills in search of guanacoës: many were seen, but they were too wild to approach. An old man arrived, who was said to be Jemmy's uncle, his father's brother; and many strangers came, who seemed to belong to the Yapoo Tekeenica tribe. Jemmy did not like their visit; he said that they were bad people, 'no friends'.

26th. While some of my party were washing in a stream, stripped to the waist, several natives collected round, and were much amused at the white skins, as well as at the act of washing, so new probably to them. One of them ran to the nearest wigwams, and a troop of curious gazers collected, whose hands, however, were soon so actively employed in abstracting the handkerchiefs, shoes, &c., which had been laid on the bank, that a stop was put to the ablutions.

We discovered that Jemmy's eldest brother was a 'doctor', and though young for his occupation of conjuring and pretending to cure illness, he was held in high estimation among his own tribe. I never could distinctly ascertain whether the



eldest man, or the doctor of a tribe had the most influence; but from what little I could learn, it appeared to me that the elder of a family or tribe had a sort of executive authority, while the doctor gave advice, not only in domestic affairs, but with respect to most transactions. In all savage nations, I believe there is a person of this description – a pretended prophet – conjuror – and, to a certain degree, doctor.

This evening our party were employed for a short time in firing at a mark, with the three-fold object of keeping our arms in order – exercising the men – and aweing, without frightening, the natives. While this was going on, the Fuegians sat about on their hams, watching our proceedings, and often eagerly talking to each other, as successful shots were made at the target, which was intentionally placed so that they could see the effect of the balls. At sunset they went away as usual, but looking very grave, and talking earnestly. About an hour after dark, the sentry saw something moving along the ground near our tents, within the boundary line, which he thought was a wild animal, and had just levelled his musket to fire at it, when he discovered it was a man, who instantly darted off, and was lost in the darkness. Some native had doubtless stolen to the tents, to see what we were doing; perhaps with a view to surprise us, if asleep, perhaps only to steal.

27th. While a few of our party were completing the thatch of the last wigwam, and others were digging in the garden which was made, I was much surprised to see that all the natives were preparing to depart; and very soon afterwards every canoe was set in motion, not half a dozen natives remaining. Even Jemmy's own family, his mother and brothers, left us; and as he could give no explanation of this sudden departure, I was in much doubt as to the cause. Whether an attack was meditated, and they were removing the women and children, previous to a general assembly of the men, or whether they had been frightened by our display on the preceding evening, and feared that we intended to attack them, I could not ascertain; but deeming the latter by far the most probable, I decided to take the opportunity of their departure to give Matthews his first trial of passing a night at the new wigwams.

Some among us thought that the natives intended to make a secret attack, on account of the great temptation our property offered; and in consequence of serious offence which had been taken by two or three old men, who tried to force themselves into our encampment, while I was at a little distance; one of whom, when resisted by the sentry, spit in his face; and went off in a violent passion, muttering to himself, and every now and then turning round to make faces and angry gestures at the man who had very quietly, though firmly, prevented his encroachment.

In consequence of this incident, and other symptoms of a disposition to try their strength, having more than three hundred men, while we were but thirty, I had thought it advisable, as I mentioned, to give them some idea of the weapons we had at command, if obliged to use them, by firing at a mark. Probably two-thirds of the natives around us at that time had never seen a gun fired, being strangers, coming from the Beagle Channel and its neighbourhood, where no vessel had been; and although our exercise might have frightened them more than



I wished, so much, indeed, as to have induced them to leave the place, it is not improbable that, without some such demonstration, they might have obliged us to fire at them instead of the target. So many strangers had arrived during the few days we remained, I mean strangers to Jemmy's family – men of the eastern tribe, which he called Yapoo – that his brothers and mother had no longer any influence over the majority, who cared for them as little as they did for us, and were intent only upon plunder. Finding this the case, I conclude that Jemmy's friends thought it wise to retreat to a neighbouring island before any attack commenced; but why they did not tell Jemmy their reasons for going, I know not, neither could he tell me more than that they said they were going to fish, and would return at night. This, however, they did not do.

In the evening, Matthews and his party – Jemmy, York, and Fuegia – went to their abode in the three new wigwams. In that made for Matthews, Jemmy also took up his quarters at first: it was high and roomy for such a construction; the space overhead was divided by a floor of boards, brought from the ship, and there most of Matthews' stores were placed; but the most valuable articles were deposited in a box, which was hid in the ground underneath the wigwam, where fire could not reach.

Matthews was steady, and as willing as ever; neither York nor Jemmy had the slightest doubt of their being all well-treated; so trusting that Matthews, in his honest intention to do good, would obtain that assistance in which he confided, I decided to leave him for a few days. The absence of the natives, every one of whom had decamped at this time, gave a good opportunity for landing the larger tools belonging to Matthews and our Fuegians, and placing them within or beneath his wigwam, unseen by any one except ourselves; and at dusk, all that we could do for them being completed, we left the place and sailed some miles to the southward.

During the four days in which we had so many natives about us, of course some thefts were committed, but nothing of consequence was stolen. I saw one man talking to Jemmy Button, while another picked his pocket of a knife, and even the wary York lost something, but from Fuegia they did not take a single article; on the contrary, their kindness to her was remarkable, and among the women she was quite a pet.

Our people lost a few trifles, in consequence of their own carelessness. Had they themselves been left among gold and diamonds, would they all have refrained from indulging their acquisitive inclinations?

Notwithstanding the decision into which I had reasoned myself respecting the natives, I could not help being exceedingly anxious about Matthews, and early next morning our boats were again steered towards Woollya. My own anxiety was increased by hearing the remarks made from time to time by the rest of the party, some of whom thought we should not again see him alive; and it was with no slight joy that I caught sight of him, as my boat rounded a point of land, carrying a kettle to the fire near his wigwam. We landed and ascertained that nothing had occurred to damp his spirits, or in any way check his inclination to make a fair trial. Some natives had returned to the place, among them one of Jemmy's





*Mount Sarmiento and the Lomas Range*

brothers; but so far were they from showing the slightest ill-will, that nothing could be more friendly than their behaviour.

Jemmy told us that these people, who arrived at daylight that morning were his friends, that his own family would come in the course of the day, and that the 'bad men,' the strangers, were all gone away to their own country.

A further trial was now determined upon. The yawl, with one whale-boat, was sent back to the Beagle, and I set out on a westward excursion, accompanied by Messrs Darwin and Hamond, in the other two boats: my intention being to complete the exploration of Whale-boat Sound, and the north-west arm of the Beagle Channel; then revisit Woollya, either leave or remove Matthews, as might appear advisable, and repair to our ship in Goree Road. With a fair and fresh wind my boat and Mr Hamond's passed the Murray Narrow, and sailed far along the channel towards the west, favoured, unusually, by an easterly breeze. Just as we had landed, and set up our tent for the night, some canoes were seen approaching; so rather than be obliged to watch their movements all night, we at once embarked our tent and half-cooked supper, and pulled along the shore some miles further, knowing that they would not willingly follow us in the dark. About midnight we landed and slept undisturbed. Next day we made little progress, the wind having changed, and landed, earlier than usual, on the north side of the channel, at Shingle Point. Some natives soon appeared, and though few in





*Mount Sarmiento from Warp Bay*

number, were inclined to give trouble. It was evident they did not know the effect of fire-arms; for if a musket were pointed at them, and threatening gestures used, they only made faces at us, and mocked whatever we did. Finding them more and more insolent and troublesome, I preferred leaving them to risking a struggle, in which it might become necessary to fire, at the hazard of destroying life. Twelve armed men, therefore, gave way to six unarmed, naked savages, and went on to another cove, where these annoying, because ignorant natives could not see us.

On the 29th we reached Devil Island, and found the large wigwam still standing, which in 1830 my boat's crew called the 'Parliament House.' Never, in any part of Tierra del Fuego, have I noticed the remains of a wigwam which seemed to have been burned or pulled down; probably there is some feeling on the subject, and in consequence the natives allow them to decay naturally, but never wilfully destroy them. We enjoyed a grand view of the lofty mountain, now called Darwin, with its immense glaciers extending far and wide. Whether this mountain is equal to Sarmiento in height, I am not certain, as the measurements obtained did not rest upon satisfactory data; but the result of those measures gave 6800 feet for its elevation above the sea. This, as an abstract height, is small, but taking into consideration that it rises abruptly from the sea, which washes its base, and that only a short space intervenes between the salt water and the lofty frozen summit, the effect upon an observer's eye is extremely grand, and equal, probably,



to that of far higher mountains which are situated at a distance inland, and generally rise from an elevated district.

We stopped to cook and eat our hasty meal upon a low point of land, immediately in front of a noble precipice of solid ice; the cliffy face of a huge glacier, which seemed to cover the side of a mountain, and completely filled a valley several leagues in extent.

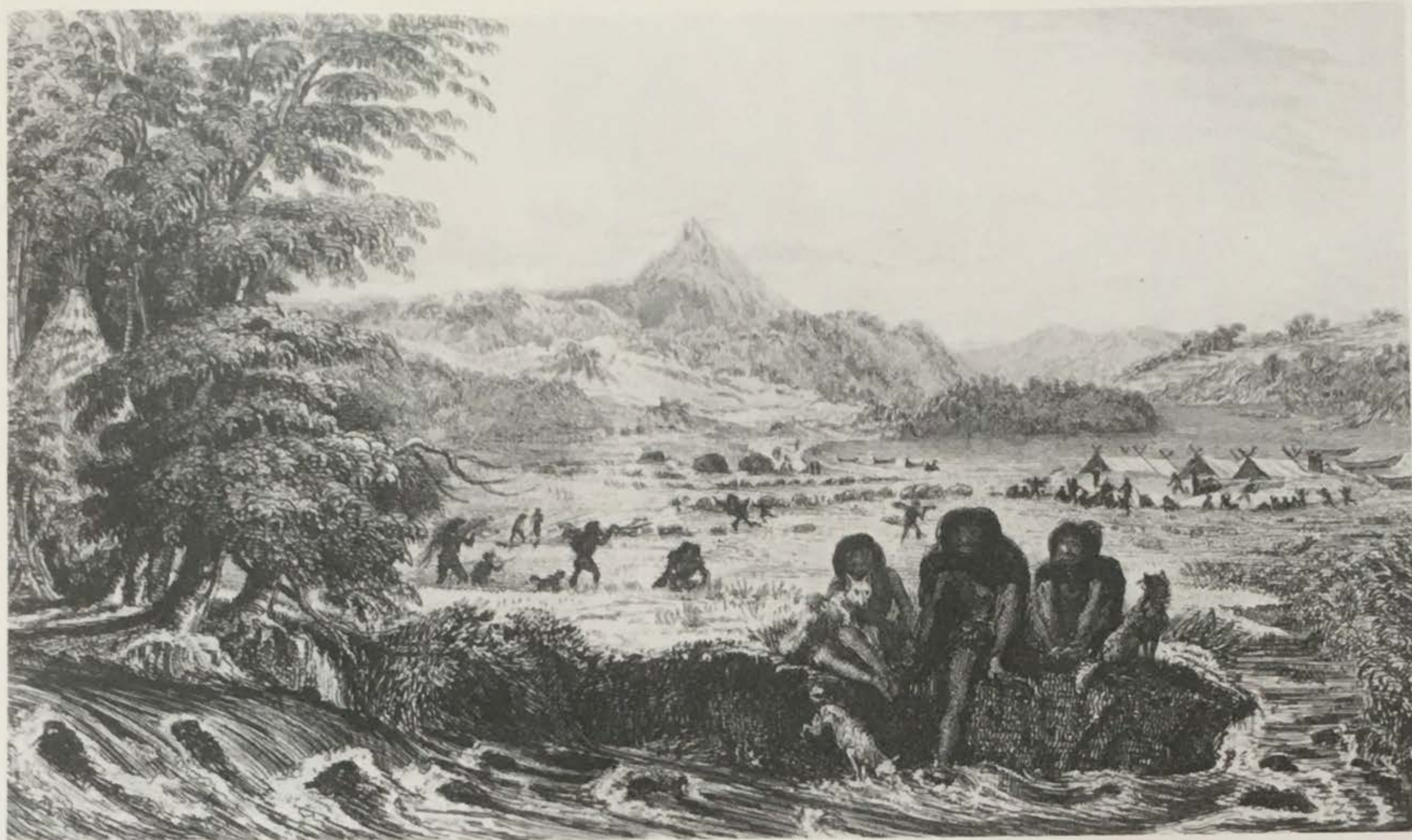
Wherever these enormous glaciers were seen, we remarked the most beautiful light blue or sea green tints in portions of the solid ice, caused by varied transmission, or reflection of light. Blue was the prevailing colour, and the contrast which its extremely delicate hue, with the dazzling white of other ice, afforded to the dark green foliage, the almost black precipices, and the deep, indigo blue water, was very remarkable.

Miniature icebergs surrounded us; fragments of the cliff, which from time to time fall into a deep and gloomy basin beneath the precipice, and are floated out into the channel by a slow tidal stream. In the first volume the frequent falling of these masses of ice is noticed by Captain King in the Strait of Magalhaens, and in the narrative of my first exploring visit to this arm of the Beagle Channel; therefore I will add no further remark upon the subject.

Our boats were hauled up out of the water upon the sandy point, and we were sitting round a fire about two hundred yards from them, when a thundering crash shook us – down came the whole front of the icy cliff – and the sea surged up in a vast heap of foam. Reverberating echoes sounded in every direction, from the lofty mountains which hemmed us in; but our whole attention was immediately called to great rolling waves which came so rapidly that there was scarcely time for the most active of our party to run and seize the boats before they were tossed along the beach like empty calabashes. By the exertions of those who grappled them or seized their ropes, they were hauled up again out of reach of a second and third roller; and indeed we had good reason to rejoice that they were just saved in time; for had not Mr Darwin, and two or three of the men, run to them instantly, they would have been swept away from us irrecoverably. Wind and tide would soon have drifted them beyond the distance a man could swim; and then, what prizes they would have been for the Fuegians, even if we had escaped by possessing ourselves of canoes. At the extremity of the sandy point on which we stood, there were many large blocks of stone, which seemed to have been transported from the adjacent mountains, either upon masses of ice, or by the force of waves such as those which we witnessed. Had our boats struck those blocks, instead of soft sand, our dilemma would not have been much less than if they had been at once swept away.

Embarking, we proceeded along a narrow passage, more like a river than an arm of the sea, till the setting sun warned us to seek a resting-place for the night; when, selecting a beach very far from any glacier, we again hauled our boats on shore. Long after the sun had disappeared from our view, his setting rays shone so brightly upon the gilded icy sides of the summits above us, that twilight lasted an unusual time, and a fine clear evening enabled us to watch every varying tint till even the highest peak became like a dark shadow, whose outline only could be



*Woollya*

distinguished. No doubt such scenes are familiar to many, but to us, surrounded even as we so often were by their materials, they were rare; because clouds continually hang over the heights, or obscure the little sunshine which falls to the lot of Tierra del Fuego.

The following day (30th) we passed into a large expanse of water, which I named Darwin Sound – after my messmate, who so willingly encountered the discomfort and risk of a long cruise in a small loaded boat. Desirous of finding an opening northwards, I traced the northern shore of this sound, mile by mile, leaving all islands to the southward until we entered Whale-boat Sound, and I recognized Cape Desolation in the distance, as well as a number of minor points which had become familiar to me during the search after our lost boat in the former voyage (1830).

*Narrative* 2 pp.206–18

After reaching the eastern end of Stewart Island, 150 miles from their starting point, the party returned to Ponsonby Sound via the southern arm of Beagle Channel.

FEB. 6th. Arrived at the settlement. Matthews gave so bad an account of the conduct of the Fuegians that the Captain advised him to return to the ship. From the moment of our leaving, a regular system of plunder commenced, in which not only Matthews, but York & Jemmy suffered. Matthews had nearly lost all his things; & the constant watching was most harassing & entirely prevented him





*The 'Beagle' in Murray Narrows*

from doing anything to obtain food &c. Night & day large parties of the natives surrounded his house. One day, having requested an old man to leave the place, he returned with a large stone on his hand. Another day, a whole party advanced with stones & stakes, & some of the younger men & Jemmy's brother were crying. Matthews thought it was only to rob him & he met them with presents. I cannot help thinking that more was meant. They showed by signs they would strip him & pluck all the hairs out of his face & body. I think we returned just in time to save his life. The perfect equality of all the inhabitants will for many years prevent their civilization, even a shirt or other article of clothing is immediately torn into pieces. Until some chief rises, who by his power might be able to keep to himself such presents as animals &c. &c., there must be an end to all hopes of bettering their condition. It would not have been so bad if all the plunder had remained in one family or tribe. But there was a constant succession of fresh canoes & each one returned with something. Jemmy's own relations were absolutely so foolish & vain as to show to strangers what they had stolen & the method of doing it.

It was quite melancholy leaving our Fuegians amongst their barbarous countrymen. There was one comfort; they appeared to have no personal fears. But, in contradiction of what has often been stated, 3 years has been sufficient to change savages into as far as habits go, complete & voluntary Europaeans. York,





*Port Louis, Falkland Islands*

who was a full grown man & with a strong violent mind, will I am certain in every respect live as far as his means go, like an Englishman. Poor Jemmy looked rather disconsolate & certainly would have liked to have returned with us; he said 'they were all very bad men, no "sabe" nothing'. Jemmy's own brother had been stealing from him; as Jemmy said, 'what fashion do you call that'. I am afraid whatever other ends this excursion to England produces, it will not be conducive to their happiness. They have far too much sense not to see the vast superiority of civilized over uncivilized habits, yet I am afraid to the latter they must return.

We took Matthews & some of the clothes which he had buried, in the boat & made sail. The Captain to save time determined to go to the South & outside of Navarin Island, instead of our returning into the Beagle channel. We slept at night at the S. entrance of Ponsonby Sound, & in the morning (7th) started for the ship. There was a fresh breeze & a good deal of sea, rather more than is pleasant for a boat, so that on reaching in the evening the Beagle, there was the pleasure of smooth water joined to that of returning after 20 days absence. The distance we have run in the boats has been about 300 miles & as it was in an East & West direction it afforded an excellent geological section of the country.

*Diary pp. 135-7*



The *Beagle* spent a further three weeks in Tierra del Fuego exploring the islands on either side of Nassau Bay, and on February 26th set off for the Falkland Islands, passing through the Strait of Le Maire with another south-westerly gale at her heels.

MARCH 1st. We arrived early in the morning at Port Louis, the most Eastern point of the Falkland Islands. The first news we received was to our astonishment, that England had taken possession of the Falkland Islands & that the Flag was now flying. These Islands have been for some time uninhabited until the Buenos Ayres Government a few years since claimed them & sent some colonists. Our government remonstrated against this, & last month the *Clio* arrived here with orders to take possession of the place. A Buenos Ayrean man of war was here at the time with some fresh colonists. Both they & the vessel returned to the Rio Plata. The present inhabitants consist of one Englishman who has resided here for some years & has now the charge of the British Flag, 20 Spaniards & three women, two of whom are negresses. The island is abundantly stocked with animals. There are about 5000 wild oxen, many horses & pigs. Wild fowl, rabbits & fish in the greatest plenty. European vegetables will grow. And as there is an abundance of water & good anchorage, it is most surprising that it has not been long ago colonized, in order to afford provisions for Ships going round the Horn. At present it is only frequented by Whalers, one of which is here now.

We received all this intelligence from a French boat, belonging to a Whaler, which is now lying a wreck on the beach. Between the 12th & 13th of January, the very time when we suffered from the gale off Cape Horn, this fine ship parted from three anchors & drove on shore. They describe the gale as a perfect hurricane. They were glad to see us, as they were at a loss what to do: all the stores are saved & of course plenty of food. Capt. FitzRoy has offered to take them, 22 in number, in the *Beagle*, & to purchase on account of the owners any stores which we may want. The rest must be sacrificed.

2nd. Mr Dixon, the English resident, came on board. What a strange solitary life his must be: it is surprising to see how Englishmen find their way to every corner of the globe. I do not suppose there is an inhabited & civilized place where they are not to be found.

*Diary* pp. 138-9

MARCH 2.

Falkland

Is not the closer connection of insects and plants [with the mainland equivalents] as well as this fact point out closer connection than Migration?

To what animals did the dung beetles in S. America belong? Scarcity of Aphidians [?]

Vide *Annales des Sciences* for Rio Plata.

The peat not forming at present and but little of the bog plants of Tierra del F; no moss; perhaps decaying vegetables may slowly increase it. Beds varying from 10 to one foot thick.



Great scarcity in Tierra del of Corallines – supplanted by Fuci: Clytra prevailing genus.

Procure Trachaea of Upland Goose.

Tues. March 12.

Examine Balanus beneath high water mark. Horses fond of catching cattle – aberration of instinct. Snipes. Examine pit for peat. Specimens of do: Have there been any bones ever found etc or timber? Are there any reptiles? or Limestone?

19th.

Ask Chaffers where gneiss came from.

Desolation Island said to be volcanic with hot springs. All the Shetland Isles with very hot springs and vesicular lava – It is clear that, in the crests, there has been in the mountain a *point* of upheaval – when strata have become mantle shaped instead of crests——

20th.

Saw a cormorant catch a fish and let it go 8 times successively like a Cat does a Mouse or otter a fish; and extreme wildness of shags. Read Bougainville.

In 1784, from returns of Gov. Figueroa, buildings amounted to 34, population, including 28 convicts, 82 persons, and cattle of all kinds 7774.

22nd.

East basin, peat above 12 feet thick resting on clay, and now eaten by sea. Lower parts very compact, but not so good to burn as higher up; small bones are found in it like rats — argument for original inhabitants, from big bones must be forming at present, but very slowly. *Fossils in slate.* . . .

What has become of lime?

It will be interesting to observe difference of species and proportionate Numbers: what also appear characters of different habitations. Migrations of geese – Falkland Islands as connected with Rio Negro?

28th.

Emberiza in flocks.

Send watch to be mended . . . . .

Enquire period of flooding of R. Negro and Plata. Is the cleavage of M. Video (an untroubled country) very generally vertical or what is the dip?

[From notebook for 1833, *Darwin and Beagle* pp. 178–9]

The country is remarkably easy of access to persons on foot; but half-concealed rivulets and numerous bogs, oblige a mounted traveller to be very cautious. There are no trees any where, but a small bush is plentiful in many vallies. Scarcely any view can be more dismal than that from the heights: moorland and black bog extend as far as eye can discern, intersected by innumerable streams, and pools of yellowish brown water. But this appearance is deceptive; much of what seems to be a barren moor, is solid sandy clay soil, covered by a thin layer of vegetable mould, on which grow shrubby bushes and a coarse grass, affording ample nourishment to cattle; besides which, one does not see into many of the vallies where there is good soil and pasture. Some tracts of land, especially those at the



south of East Falkland, differ in character, being low, level, and abundantly productive of excellent herbage.

Mr Darwin's volume will doubtless afford information as to the geological formation of the Eastern Falkland. He did not visit the western island, but obtained many notices of it from those who were there. The more elevated parts of East Falkland are quartz rock; clay-slate prevails in the intermediate districts. Sandstone, in which are beautifully perfect impressions of shells, occurs in beds within the slate formation: and upon the slate is a layer of clay, fit for making bricks. Near the surface, where this clay is of a lighter quality, and mixed with vegetable remains, it is good soil, fit for cultivation. In some places, a great extent of clay is covered by a layer of very solid peat, varying in depth from two to ten feet. The solidity of this peat is surprising; it burns well, and is an excellent substitute for other fuel. To the clay and to the solid peat may be attributed the numerous bogs and pools of water, rather than to the total amount of rain. Is the peat now growing, or was the whole mass formed ages ago?

The settlement, now consisting only of a few huts, some cottages, and a ruinous house or two, occupies the place originally selected by Bougainville, close to Port Louis, at the head of Berkeley Sound. Standing in an exposed situation, scattered over half a mile of rising ground, without a tree or even a shrub near it, the unfortunate village has a bleak and desolate appearance, ominous of its sad history. Previous, however, to entering upon the affairs of the settlement, I will continue my sketch of the islands and their present produce, independent of the settlers now there.

By the French, and afterwards by the Spanish colonists, a number of black cattle, horses, pigs, and rabbits, were turned loose upon East Falkland; and, by considerate persons, engaged in whale or seal-fishery, both goats and pigs have been left upon smaller islands near West Falkland. These animals have multiplied exceedingly; and, although they have been killed indiscriminately by the crews of vessels, as well as by the settlers, there are still many thousand head of cattle, and some thousand horses, besides droves of pigs, perfectly wild, upon the eastern large island: while upon Carcass Island, Saunders Island, and others, there are numbers of goats and pigs. In 1834, the smallest estimate exceeded twelve thousand cattle, and four thousand horses; but there were no means of ascertaining their number, except by comparing the accounts of the gaucho colonists, who were accustomed to pursue them, not only for ordinary food or for their hides, but even for their tongues alone, not taking the trouble to carry off more of the animal so wantonly slaughtered. The wild cattle are very large and very fat, and the bulls are really formidable animals, perhaps among the largest and most savage of their race. At Buenos Ayres, the ordinary weight of a bull's hide is less than fifty pounds, but the weight of such hides in the East Falkland has exceeded eighty pounds. The horses look well while galloping about wild, but the gauchos say they are not of a good breed, and will not bear the fatigue of an ordinary day's work, such as a horse at Buenos Ayres will go through without difficulty. Perhaps their 'softness,' as it is there called, may be owing to the food they get, as well as to the breed. The wild pigs on East Falkland are of a long-legged, ugly kind; but



some of those on Saunders Island and other places about West Falkland are derived from short-legged Chinese pigs. The only quadruped apparently indigenous is a large fox, and as about this animal there has been much discussion among naturalists, and the specimens now in the British Museum were deposited there by me, I am induced to make a few remarks upon it.

It has been said, that there are two varieties of this 'wolf-fox,' as it has been called, one being rather the smaller, and of a redder brown; but the fact is, that no other difference exists between the two apparent varieties, and as the darker coloured larger animal is found on the East Falkland, while the other is confined to the western island, the darker colour and rather thicker furry coat may be attributed to the influence of a somewhat colder climate. The fox of West Falkland approaches nearer the large fox of Patagonia, both in colour and size, than its companion of East Falkland does; but allowing that there is one shade of difference between the foxes of East and West Falkland, there are but two, or at most three shades between the animal of West Falkland and the large fox of Port Famine. In Strong's voyage (1690), Simson describes these foxes as being twice as large as an English fox, but he does not say upon which island.

*Narrative* 2 pp. 247-50

MARCH 10th to Sunday 17th. This is one of the quietest places we have ever been to. Nearly all the ships are gone; & no one event has happened during the whole week. The boats are employed in surveying.

I walked one day to the town, which consists in half a dozen houses pitched at random in different places. In the time of the old Spaniards, when it was a Botany Bay for Buenos Ayres, it was in a much more flourishing condition. The whole aspect of the Falkland Islands was however changed to my eyes from that walk; for I found a rock abounding with shells; & these of the most interesting geological aera.

*Diary* p. 140

The geological structure of these islands is in most respects simple. The lower country consists of clay-slate and sandstone associated together, and the hills of white granular quartz rock. The strata of the latter are frequently arched with perfect symmetry, and the appearance of some of the masses is in consequence most singular. Pernety has devoted several pages to the description of a hill of ruins, the successive strata of which he has justly compared to the seats of an amphitheatre. The quartz rock must have been quite pasty when it underwent such remarkable flexure without being shattered into fragments. As a passage between the quartz and the sandstone can be traced, it seems probable that the former owes its origin to the sandstone having been heated to such an excess, that it became viscid, and upon cooling crystallized. While in the soft state it must have been pushed up through the overlying beds.

The sandstone and clay-slate contain numerous casts of organic remains. These chiefly consist of shells allied to terebratula, of encrinites, of a branching coral divided into alternate compartments, and lastly, of an obscure impression of the



lobes of a trilobite. These fossils possess great interest, because none hitherto have been brought to Europe from a latitude nearly so far south. Mr Murchinson, who had the kindness to look at my specimens, says that they have a close general resemblance to those belonging to the lower division of his Silurian system; and Mr James Sowerby is of opinion that some of the species are identical. This would be a most remarkable circumstance in the ancient natural history of the world; for shells now living in latitude  $50^{\circ}$  on opposite sides of the equator, are totally distinct. From the similarity of the Falkland fossils with those in England which are associated with remains that indicate a climate of a tropical character, we may I presume infer that, during this same epoch, nearly the whole world was thus circumstanced.

In many parts of the island, the bottoms of the valleys are covered in an extraordinary manner, by myriads of great angular fragments of the quartz rock. These have been mentioned with surprise by every voyager since the time of Pernety. The whole may be called 'a stream of stones'. The blocks vary in size, from that of a man's chest to ten or twenty times as large, and occasionally they altogether exceed such measures. Their edges show no signs of being water-worn, but are only a little blunted. They do not occur thrown together in irregular piles, but are spread out into level sheets, or great streams. It is not possible to ascertain their thickness, but the water of small streamlets could be heard trickling through the stones many feet below the surface. The actual depth is probably much greater, because the crevices between the lower fragments must long ago have been filled up with sand, and the bed of the rivulet thus raised. The width of these beds varies from a few hundred feet to a mile; but the peaty soil daily encroaches on the borders, and even forms islets wherever a few fragments happen to lie close together. In a valley south of Berkeley Sound, which some of our party called the 'great valley of fragments', it was necessary to cross an uninterrupted band half a mile wide, by jumping from one pointed stone to another. So large were the fragments, that being overtaken by a shower of rain, I readily found good shelter beneath one of them.

Their little inclination is the most remarkable circumstance in these 'streams of stones'. On the hill-sides I have seen them sloping at an angle of ten degrees with the horizon; but in some of the level, broad-bottomed valleys, the inclination is only just sufficient to be clearly perceived. On so rugged a surface there was no means of measuring the angle; but to give a common illustration, I may say that the slope alone would not have checked the speed of an English mail-coach. In some places, a continuous stream of these fragments followed up the course of a valley, and even extended to the very crest of the hill. On these crests huge masses, exceeding in dimensions any small building, seemed to stand arrested in their headlong course: there, also, the curved strata of the archways lay piled over each other, like the ruins of some vast and ancient cathedral. In endeavouring to describe these scenes of violence, one is tempted to pass from one simile to another. We may imagine, that streams of white lava had flowed from many parts of the mountains into the lower country, and that, when consolidated, they had been rent by some enormous convulsion into myriads of fragments. The



expression, 'streams of stones', which immediately occurred to every one, conveyed the same idea. These scenes are, on the spot, rendered more striking, by the contrast of the low, rounded forms of the neighbouring hills.

I was much interested by finding on the highest peak of one range (about 700 feet above the sea) a great arched fragment, lying on its convex or upper surface. Must we believe that it was fairly pitched up in the air, and thus turned? Or, with more probability, that there existed formerly a part of the same range more elevated than the point on which this monument of a great convulsion of nature now lies. As the fragments in the valleys are neither rounded nor the crevices filled up with sand, we must infer that the period of violence was subsequent to the land having been raised above the waters of the sea. In a transverse section within these valleys the bottom is nearly level, or rises but very little towards either side. Hence the fragments appear to have travelled from the head of the valley; but in reality it seems most probable, either that they have been hurled down from the nearest slopes, or that masses of rock were broken up in the position they formerly occupied; and that since, by a vibratory movement of overwhelming force, the fragments have been levelled into one continuous sheet. If during the earthquake which in 1835 overthrew Concepcion, in Chile, it was thought wonderful that small bodies should have been pitched a few inches from the ground, what must we say to a movement which has caused fragments, many tons in weight (like so much sand on a vibrating board), to move onwards and find their level? I have seen, in the Cordillera of the Andes, the evident marks where stupendous mountains have been broken into pieces like so much thin crust, and the strata thrown on their vertical edges; but never did any scene, like the 'streams of stones', so forcibly convey to my mind the idea of a convulsion of which in historical records we might in vain seek for any counterpart.

*Narrative* 3 pp.253-6

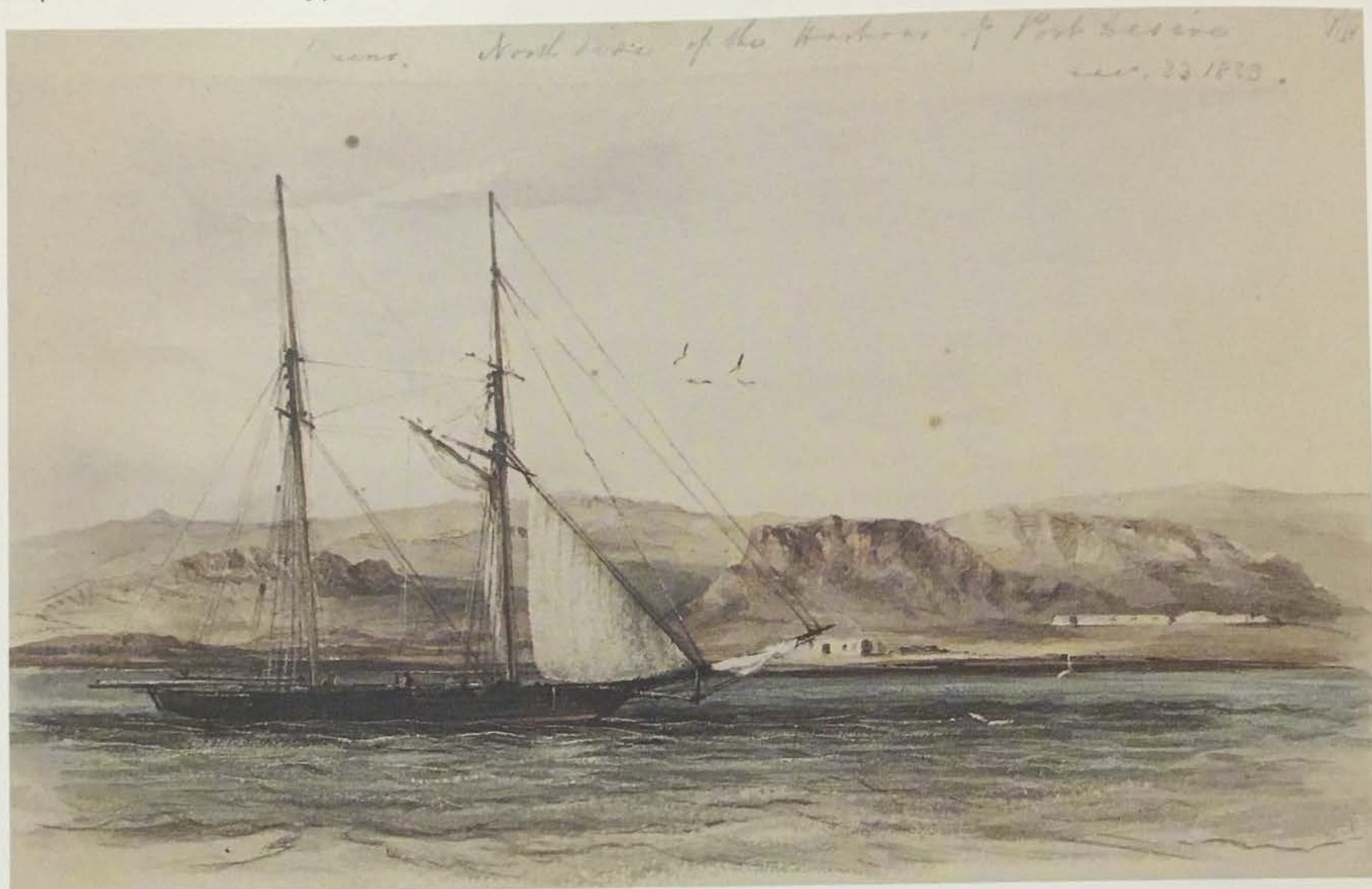
Early in March a sealing schooner, the *Unicorn*, arrived in the Falkland Islands after a season so unsuccessful that her owner was compelled to meet his debts by the immediate sale of his vessel.

At this time I had become more fully convinced than ever that the *Beagle* could not execute her allotted task before she, and those in her, would be so much in need of repair and rest, that the most interesting part of her voyage – the carrying a chain of meridian distances around the globe – must eventually be sacrificed to the tedious, although not less useful, details of coast surveying.

Our working ground lay so far from ports at which supplies could be obtained, that we were obliged to occupy whole months in making passages merely to get provisions, and then overload our little vessel to a most inconvenient degree, as may be supposed, when I say that eight months' provisions was our usual stock at starting, and that we sailed twice with ten months' supply on board.

I had often anxiously longed for a consort, adapted for carrying cargoes, rigged so as to be easily worked with few hands, and able to keep company with the *Beagle*; but when I saw the *Unicorn*, and heard how well she had behaved as a sea-boat, my wish to purchase her was unconquerable. A fitter vessel I could hardly





*'Adventure' at Port Desire*

have met with, one hundred and seventy tons burthen, oak built, and copper fastened throughout, very roomy, a good sailer, extremely handy, and a first-rate sea-boat; her only deficiencies were such as I could supply, namely, a few sheets of copper, and an outfit of canvas and rope. A few days elapsed, in which she was surveyed very carefully by Mr May, and my mind fully made up, before I decided to buy her, and I then agreed to give six thousand dollars (nearly £1,300) for immediate possession. Being part owner, and authorized by the other owners to do as he thought best with the vessel in case of failure, Mr Low sold her to me, payment to be made into his partners' hands at Monte Video. Some of his crew being 'upon the lay,' that is, having agreed to be paid for their work by a small proportion of the cargo obtained, preferred remaining at the Falklands to seek for employment in other vessels, others procured a passage in the *Rapid*, and a few were engaged by me to serve in their own vessel which, to keep up old associations, I named 'Adventure.' Mr Chaffers and others immediately volunteered to go in her temporarily (for I intended to place Mr Wickham in her if he should be willing to undertake the responsibility), and no time was lost in cleaning her out thoroughly, loading her with stores purchased by me from M. le Dilly and from Mr Bray (lately master of the *Transport*), and despatching her to Maldonado, to be prepared for her future employment.

This schooner was built at Rochester as a yacht for Mr Perkins, and, as I have



reason to believe, cost at least six thousand pounds in building and first outfit. Soon afterwards, she was armed and used by Lord Cochrane in the Mediterranean; then she was fitted out by a merchant to break the blockade of Buenos Ayres; but, taken by a Brazilian man-of-war, and carried into Monte Video, she was condemned as a prize and sold to Mr Hood, the British Consul, who went to England and back again in her with his family; after which, she was fitted out for the sealing expedition I have mentioned. At the time of my purchase she was in want of a thorough refit, and her internal arrangements required alteration; but it happened that Mr Bray and M. le Dilly had each saved enough from their respective vessels to enable me to load the *Adventure* on the spot with all that she would require; from the former I bought anchors, cables, and other stores, amounting to £216: and from M. le Dilly rope, canvas, and small spars, for which £187 were paid. Those who were conversant in such matters, the master, boatswain, and carpenter of the *Beagle*, as well as others, assured me that these articles were thus obtained for less than a third of their market prices in frequented ports.

*Narrative* 2 pp.273-5

C.D. TO MISS CAROLINE DARWIN

Falkland Island: Berkeley Sound: March 30th 1833

My dear Caroline

The *Beagle* will sail in a few days for M Video, & as this sheet of paper is very large I have taken a good time to begin my letter. It is now four months since my last letter, so I will write a sort of journal of everything which has since happened. That we might not lose the long days we made a straight course for the South: my first introduction to the notorious Tierra del F was at Good Success Bay & the master of ceremonies was a gale of wind. This place was visited by Capt. Cook; when ascending the mountains which caused so many disasters to Mr Banks I felt that I was treading on ground which to me was classic.

We here saw the native Fuegian: an untamed savage is I really think one of [the] most extraordinary spectacles in the world – the difference between a domesticated & wild animal is far more strikingly marked in Man – in the naked barbarian with his body coated with paint, whose very gestures, whether they may be peaceable or hostile, are unintelligible, with difficulty we see a fellow-creature. No drawing or description will at all explain the extreme interest which is created by the first sight of savages. It is an interest which almost repays one for a cruise in these latitudes; & this I assure you is saying a good deal.

We doubled Cape Horn on a beautiful afternoon; it was however the last we were doomed to have for some time. After trying to make head against the Westerly gales, we put into a cove near the Cape. Here we experienced some tremendous weather; the gusts of wind fairly tear up the water & carry clouds of spray. We again put to sea, with no better success; gales succeed gales with such short intervals that a ship can do nothing. After 23 days knocking about we only reached false Cape Horn a few miles distant. The finale gale was worthy of the reputation which this climate since Anson's times has possessed. The Captain



considers it the most severe one he was ever in. We have already heard of two vessels which were wrecked at the very same period. At Breakfast I was remarking that a gale of wind was nothing so very bad in a good sea-boat: the Captain told me to wait till we shipped a sea; it was prophetic; for at noon we shipped a great one, & it is a sight for a landsman to remember. One of our boats was knocked to pieces & was immediately cut away: the water being deep on the deck, it did me an infinity of harm, as it wetted a great deal of paper & dried plants. I suffered also much from sea-sickness & yet with all this I am becoming quite hardened; it makes me however think with greater ecstasy of the warm serene air & the beautiful forms of the Tropics. No discipline of Mahomet ever looked to his seventh heaven with greater zeal than I do to those regions.

Having found a good anchorage, we took the Fuegians & Matthews in a flotilla of boats to Jemmy Buttons country. Jemmy's relations knew him, but having forgotten his language & being dressed in clothes, they paid no attention to him, & were much more earnest in begging for knives &c. Having dug a garden & built houses, the Captain went (taking me with him) on a long surveying cruise with two boats; when we returned to the Settlement, things were in a ruinous condition, almost everything had been plundered, & the Fuegians had made such signs to Matthews that the Captain advised him not to stay with them. These Fuegians are Cannibals; but we have good reason to suppose it carried on to an extent which hitherto has been unheard of in the world. Jemmy Button told Matthews, a long time since, that in winter they sometimes eat the women. Certain it is the women are in a very small proportion. Yet we could not believe it. But the other day a Sealing Captain said that a Fuegian boy whom he had, said the same thing. Upon being asked 'why no eat dogs', the boy answered 'dog catch otter: woman good for nothing: man very hungry'. He said they smothered them; it is difficult to disbelieve two such distinct explicit accounts & given by boys. Was ever anything so atrocious heard of, to work them like slaves to procure food in the summer, & occasionally in winter to eat them. I feel quite a disgust at the very sound of the voices of these miserable savages.

This boat expedition was exceedingly interesting. We went about 300 miles & were absent 23 days. The worst part was the Fuegians being in such large bodies, that we were often obliged to find a quiet sleeping place after it was dark. This often precluded us from the greatest luxury; a shingle beach for a bed. The greater part of the way was in the Beagle Channel, an arm of the sea which connects the Atlantic & Pacific. Some of the scenes from their retirement & others from their desolate air, were very grand. Glaciers descend to the waters edge; the azure blue of the ice, contrasted with the white snow, & surrounded by dark green forests, were views as beautiful as they were novel to me. An avalanche falling into the water put us for a second in great peril – our boats were hauled up on the beach, but a great wave rushed onwards & nearly dashed them to pieces: our predicament, without food & surrounded by Savages, would not have been comfortable.

We arrived here in the Falkland Islands in the beginning of this month, & after such a succession of gales that a calm day is quite a phenomenon. We found to our



great surprise the English flag hoisted. I suppose the occupation of this place has only just been noticed in the English papers, but we hear all the southern part of America is in a ferment about [it]. By the awful language of Buenos Ayres one would suppose this great Republic meant to declare war against England! These islands have a miserable appearance; they do not possess a tree; yet from their local situation will be of great importance to shipping; from this Cause the Captain intends making an accurate survey.

A great event has happened here in the history of the Beagle – it is the purchase of a large Schooner 170 tons, only 70 less than the Beagle. The Captain has bought it for himself, but intends writing to the Admiralty for men &c, &c. Wickham will have the command: it will double our work, perhaps shorten our cruize, will carry water & provisions, & in the remote chance of fire or sticking on a Corall reef may save many of our lives. It is the present intention to take the Schooner to the Rio Negro & there to refit, whilst the Beagle goes to M. Video: if so I shall stay at the former place; as it is a nice wild place, & the Rio Plata I detest.

I have been very successful in geology, as I have found a number of fossil shells, in the very oldest rocks, which ever have organic remains. This has long been a great desideratum in geology, viz. the comparison of animals of equally remote epocks at different stations in the globe. As for living creatures, these wretched climates are very unfavourable; yet I have the great satisfaction to find my powers of examining & describing them have increased at a great pace. As for our future plans I know nothing; circumstances alter them daily. I believe we must have one more trip to the South, before finally going round the Horn, or rather passing the Sts of Magellan, for the Captain had enough of the great sea at the Cape to last him all his life. I am quite astonished to find I can endure this life; if it was not for the strong & increasing pleasure from Nat: History, I never could. It is a tempting thought, to fancy you all round the fire, & I perhaps plaguing Granny for some music. Such recollections are very vivid, when we are pitching bows under & I am sea-sick & cold. Yet if I was to return home now, I should feel as if there had been no interval of time; I suppose it is from having so thoroughly made up my mind for a long absence.

March 8th. We have just had our usual luck in a heavy gale of wind; but I wont write any more for I have not half got over my sea-sickness, & am ready to exclaim all is vanity & vexation of spirit.

April 12th. Of this same vexation of spirit there is an abundance in a ship: it is paying a heavy price, but not too dear, to see all which we see: but such scenes it would be impossible to behold by any other means: and for the zeal which this voyage has given me for every branch of Natural History I shall never cease being glad.

Wickham will be a heavy loss to this vessel; there is not another in the ship worth half of him. Hamond also, who lately joined the Beagle, from stammering & disliking the Service intends leaving it altogether. I have seen more of him than any other one, & like him accordingly. I can very plainly see there will be not much pleasure or contentment till we get out of these detestable latitudes, & are carrying on all sail to the land where Bananas grow. Oh, those realms of peace &



joy; I trust, by this time next year, we shall be under their blue sky & clear atmosphere. At this instant we are shortening sail, as by the morning we expect to be in sight of the mouth of the Rio Negro. I *send* by the Beagle (if I stay behind) a bill for 40£: I owe some little money & I hope to live on shore at the Rio Negro. I shall get your letters in about a months time; a pleasure which thanks to you all, never fails me. With my most affectionate love to my Father & to all of you & may you all be happy: believe me dear Caroline,

Ys very sincerely,  
Chas Darwin.

*Darwin and Beagle* pp. 79–84

C.D. TO PROFESSOR HENSLOW

[*Beagle*, at sea] April 11th 1833

My dear Henslow

We are now running up from the Falkland Islands to the Rio Negro (or Colorado). The Beagle will proceed to M: Video; but if it can be managed I intend staying at the former place. It is now some months since we have been at a civilized port, nearly all this time has been spent in the most Southern part of Tierra del Fuego. It is a detestable place, gales succeed gales with such short intervals that it is difficult to do anything. We were 23 days off Cape Horn & could by no means get to the Westward. The last & finale gale, before we gave up the attempt was unusually severe. A sea stove one of the boats & there was so much water on the decks, that every place was afloat; nearly all the paper for drying plants is spoiled & half of this cruizes collection.

We at last run in to harbor & in the boats got to the West by the inland channels. As I was one of this party, I was very glad of it: with two boats we went about 300 miles, & thus I had an excellent opportunity of geologising & seeing much of the Savages. The Fuegians are in a more miserable state of barbarism than I had expected ever to have seen a human being. In this inclement country, they are absolutely naked, & their temporary houses are like what children make in summer, with boughs of trees. I do not think any spectacle can be more interesting, than the first sight of Man in his primitive wildness. It is an interest, which cannot well be imagined untill it is experienced. I shall never forget when entering Good Success Bay, the yell with which a party received us. They were seated on a rocky point, surrounded by the dark forest of beech; as they threw their arms wildly round their heads & their long hair streaming, they seemed the troubled spirits of another world.

The climate in some respects, is a curious mixture of severity & mildness: as far as regards the animal kingdom the former character prevails; I have in consequence, not added much to my collections. The geology of this part of Tierra del was, as indeed every place is, to me very interesting – the country is non-fossiliferous & a common place succession of granitic rocks & slates: attempting to make out the relation of cleavage, strata etc etc was my chief amusement. The mineralogy however of some of the rocks, will I think be curious, from their resemblance to those of Volcanic origin. In Zoology, during the whole cruize, I have done little; the Southern ocean is nearly as sterile as the



continent it washes. Crustaceae have afforded me most work: it is an order most imperfectly known: I found a Zoea, of most curious form, its body being only  $1/6$  the length of the two spears. I am convinced from its structure & other reasons it is a young *Erichthus*! I must mention part of the structure of a Decapod, it is so very anomalous: the last pair of legs are small & dorsal, but instead of being terminated by a claw, as in all others, it has three curved bristle-like appendages; these are finely serrated & furnished with cups, somewhat resembling those of the Cephalopods. The animal being pelagic, it is a beautiful structure to enable it to hold on to light floating objects. I have found out something about the propagation of that ambiguous tribe, the Corallines. And this makes up nearly the poor catalogue of rarities during this cruize.

After leaving Tierra del we sailed to the Falklands. I forgot to mention the fate of the Fuegians whom we took back to their country. They had become entirely European in their habits & wishes: so much so that the younger one had forgotten his own language & their countrymen paid but very little attention to them. We built houses for them & planted gardens, but by the time we return again on our passage round the Horn, I think it will be very doubtful how much of their property will be left unstolen.

On our arrival at the Falklands, everyone was much surprised to find the English flag hoisted. This our new island, is but a desolate looking spot, yet must eventually be of great importance to shipping. I had here the high good fortune, to find amongst most primitive looking rocks, a bed of micaceous sandstone, abounding with *Terebratula* & its subgenera & *Entrochitus*. As this is so remote a locality from Europe I think the comparison of these impressions, with those of the oldest fossiliferous rocks of Europe will be pre-eminently interesting. Of course there are only models & casts; but many of these are very perfect. I hope sufficiently so to identify species. As I consider myself your pupil, nothing gives me more pleasure, than telling you my good luck.

I am very impatient to hear from you. When I am sea-sick & miserable, it is one of my highest consolations, to picture the future, when we again shall be pacing together the roads round Cambridge. That day is a weary long way off; we have another cruize to make to Tierra del next summer, & then our voyage round the world will really commence. Capt FitzRoy has purchased a large Schooner of 170 tons. In many respects it will be a great advantage having a consort: perhaps it may somewhat shorten our cruize: which I most cordially hope it may: I trust however that the Corall reefs & various animals of the Pacific may keep up my resolution. Remember me most kindly to Mrs Henslow & all other friends; I am a true lover of Alma Mater, & all its inhabitants. Believe me my dear Henslow

Your affectionate & most obliged friend

Charles Darwin

Recollect, if [you] should think of any books, scientific travels etc etc which would be useful to me, do not let them pass out of yr mind.

We are all very curious to hear *something* about *some* great Comet which is coming at *some* time. Do pump the learned & send us a report.

I am convinced from talking to the finder, that the *Megatherium*, sent to Geol:



Soc: belongs to same formation which those bones I sent home do & that it was washed into the River from the cliffs which compose the banks: Professor Sedgwick might like to know this: & tell him I have never ceased being thankful for that short tour in Wales.

*Darwin & Henslow* pp.71-4

The renamed *Adventure* sailed for the mainland of South America on April 4th, followed two days later by the *Beagle*. They went first to the mouth of the River Negro, but unable to make contact there with Lieutenant Wickham and his two schooners, proceeded north to their anchorage off Maldonado.

APRIL 19th. All our plans have undergone a complete revolution. During the night the soundings were very irregular & in the same proportion, dangerous; so that we were obliged to heave to, and in consequence of this a current set us far to the South. In the morning a fresh N.W. breeze sprung up; from these various disadvantages, the Captain gave up the attempt to find Mr Wickham or of landing me at Rio Negro, & made sail for Maldonado. If the wind, that omnipotent & overbearing master, permits it, the *Beagle* will touch at Maldonado & proceed on to M. Video & Buenos Ayres. I intend stopping at the former place, as it possesses the two great advantages of retirement & novelty.

20th. It blew half a gale of wind; but it was fair, & we scudded before it. Our decks fully deserved their nickname of a 'half tide rock'; so constantly did the water flow over them.

Sunday 21st, 22nd, 24th. At noon 300 miles from Maldonado, with a foul wind. Our usual alternation of a gale of wind & a fine day. We are off the mouth of the Plata. At night there was a great deal of lightning; if a hurricane had been coming, the sky could not have looked much more angry. Probably we shall hear there has been at M. Video a tremendous Pampero. Our Royal mast head shone with St Elmo's fire & therefore, according to all good sailors, no ill luck followed. It is curious how the R. Plata seems to form a nucleus for thunder storms; phenomena which both to the South & North of it are comparatively rare.

25th & 26th. At daybreak we found a current had set us several miles to leeward of Maldonado; as the breeze was both strong & fair the Captain determined to run on to M. Video. We arrived there a little after noon. I went on shore & saw Mr Earl. He remained at this place during our whole cruize in hopes of recovering his health, in which respect, however, I am afraid he has had little success. In the evening received letters from home dated Sept. 12th, Octob. 14th, Novem. 12th, & Decr. 15th.

During our absence things have been going on pretty quietly with the exception of a few revolutions.

*Diary* pp.144-5





*Montevideo*

R.F. TO CAPTAIN BEAUFORT, PRIVATE

Beagle, Monte Video. 10th May 1833

Dear Captain Beaufort,

I began to write on a small piece of paper, intending to say only ten words by this Packet, and wait for the next; but to my horror I found my paper full and no room left for the ten words, so I have taken a large sheet. Your kind letters of Sept 5 and Decr 6 have reached me; and a 'little note' of Sept 10 also. The two former are like Sherbet to a wanderer in the deserts of Arabia, but they are too short in substance, & too long in flattery. Your mention of Sir Capitals Homberg amuses me much – he knows as much about the rocks off Cape Horn as your *pen*, that *everlasting* pen with which you *always* write; and as to *his* praise, he clothes *every* goose of his acquaintance with the feathers of a Swan, but you see he cannot prevent their cackling.

In your letter of 5 Sept. you speak of the Mer. dist. between Rio de Janeiro and Monte Video, also to the Straits of Magellan. From Rio Southwards, Capt. Foster, Capt. King and your humble servant have always agreed to an 'affigraffy' – the later results only confirm the former. The *difference* was between England, or rather Madeira, and Rio de Janeiro. I am not sorry to see that Mr Henderson's calculations, as well as those of the lamented Mr Fallows, confirm the Beagle's Chronometers. If you apply the Chanticleer's measure, from the Cape to Fernando Noronha, you will find the result satisfactory. The Beagle's position of



Fero. Nora. from England, or from Rio, agrees with that of Mr Fallows, measured from his observatory at the Cape.

With this letter I send a copy of a paper given by me to Charles Talbot, Captain of the Warspite, many months since. I find nothing to alter in it at present, and I wish the great Captain Cook could look at the modern longitudes of Cape Horn – the *very same as his*, I believe.

I like your addition to, or subtraction from the log book very much, and have adopted it. You would have smiled at hearing some of my Shipmates saying, during the last cruize, ‘if Captain Beaufort were here now he’d call this *fifteen*’ (alluding to the *wind numbers*) – we certainly had a large share of *eleven*, at the *least*. The numbers & letters are as familiarly used now as could be desired, & no one would willingly return to the old plan. The abbreviations for Soundings &c were much wanted, and are very welcome.

A sad mistake has been made about the Charts I asked for – my words were ‘*South Sea*, in three sheets, two copies’ (as will be found in my letter dated 16th Augt 1832 & numbered 6) and I have received a very abridged Chart of *South America* which is of *no use at all*. Please, as the little boys say, let me have the ‘*Great South Sea*’ before I fall in with whalers and those kind of gentry in the Pacific, from whom I shall frequently be able to pick up hints. In addition, the use they will be of as Track Charts upon which I may lay down all I can, and still preserve a clean copy besides, makes them very desirable in my eyes.

I have not yet received the Instruments from Worthington & Allan, of which you kindly gave me notice; but I have written to the Consul at Rio de Janeiro to ask if he has received, or heard of, them. I fear the Station Pointer I asked for a long time ago, ‘letter 1’, has been overlooked; I do not think it would be denied. I am vexed at the loss of Bahia Plan & St Jago – in future I will always give a most special list and ask for as special a receipt. Think of that same person, who carried the missing box, having carried three boxes of mine (Bahia flowers) to *Chatham* instead of *Plymouth* (where he *did* anchor), and leaving them in the *Custom House* to *take their chance!!* When I catch that same Skipper Hope of the Tyne I’ll give him a benefit. I just missed him at the Falklands & found only a letter from him to (I suppose) his wife, which I will serve better than he did my boxes, and ask you to forward.

You say ‘why don’t you send letters for your friends?’. I cannot defend myself, my friends have been very kind in writing to me, & I have treated them shamefully, but I *will* write – and by the bye, I *have* written a *good deal*, though not by your way. Notwithstanding all your kind offers, neither I nor any of us can make up our minds to bother you as if you were a ‘Postman’. We will send a few letters, heavy ones, and be very thankful to you; but I have not yet recovered the conscience ache which the last bundle I sent to you gave me. I am sure there were enough there to torment your assistant, if *you* threw them away in *astonishment* at my *impudence*.

I am most anxious to hear who is to pay for the two little craft ‘Paz’ & ‘Liebre’, whether His Majesty or His Majesty’s humble servant, and what Captain Beaufort thinks of my tricks. I can assure that gentleman that they have done good service, and I hope before September to send home such a batch of work as will give him



satisfaction. We have not idled in the Beagle – and Wickham and Stokes have been *slaving* (as I *hear*).

You will not be surprised at my not *now* sending copies of the rough material I have collected, when I tell you that I came up from the Falklands with one Lieut, one mate, one mid, the Surgeon and the Purser; and that at *this moment* there are on board, one mid, ten men and myself. The others who came up in the ship from the Falklands, are on shore for a run, and those who did not come up are scattered about the coast like the crew of a Sealer. At this moment (*Credat Judoeus*, don't tell the Bigwigs) I have got *five* sail at work – but I must explain.

At the Falkland Islands I bought a fine Schooner, of 170 tons burthen, coppered, copper fastened, armed with six light guns, and built of the very best English oak as a yacht for Mr Perkins, the brewer. She cost him *six thousand pounds* before she was off the stocks, and another thousand in fitting out. I have bought the vessel, stores sufficient for three years, of every description, new copper for her bottom, with everything wanted for recoppering, and three good boats, for £2000, and am not displeased with my bargain. Being a very fine vessel and an excellent sea boat, her owner thought to make a fortune by Sealing, but the season has been so desperately bad that no vessel, however good, could defy the Gales; and into Berkeley Sound came this Vessel, the Unicorn by name. Her Master, who was part Owner, ruined by the adventure, not having taken skins enough to pay the vessel's outfit, all hands quarrelling and going ashore, no one to keep the vessel. I was the best bidder & got her for £1300 – the remaining £700 go for stores, Copper, and outfit. From two wrecked ships I filled her hold with *excellent* stores, purchased for less than half their value, and packed her off for Maldonado. There she now lies, clearing out for heaving down, and my next letter will tell you, I hope, that she is coppered & fitting out. I have already bought the copper, and paid for it too – as well as for the *Vessel*, to her *owners* in *this* town. Our Master has her now in charge, but I have sent a small schooner (hired) of the same breed as the Paz & Liebre to bring Lieut Wickham up to Maldonado to fit out his new command, while Stokes works away to the Southward, and I go to the River Negro, & with Darwin take a peep at the 'interior'. Darwin is left at Maldonado. As soon as the men have had their run ashore, I go to Maldonado, there heave down & copper my craft (taking eight carpenters, whom I have hired, with me), work in peace at the Charts (*this place is too civilized*), & when Wickham is settled to his new job, take Darwin on board & go Southwards, leaving Wickham to finish and afterwards join company.

Now *pray fight my battle* & get me *twenty super-numerary Seamen* for the Beagle – *fifteen AB & five first class* ratings – it will save my pocket *so very much*, & have them you know I must, either for *his Majesty* or *myself*. I feel as if we could now get on fast again, & much more securely, by having so fine a craft to carry our *luggage, provisions, boats, &c, &c*. I mean to make her a regular '*Lighter*'.

Yours most respectfully and sincerely,  
Robt FitzRoy

P.S. I have already shipped *half* of the Unicorn's crew.

[from the archives of the Hydrographic Department, Taunton]



On arrival at Maldonado, FitzRoy chartered another small schooner, the *Constitucion*, to return to the River Negro in search of Wickham.

Next day (2d) [May] the Beagle returned to Monte Video, to procure carpenters, plank, and copper for the Adventure. I found that she was so fine a vessel, and so sound, that it was well worth while to copper her entirely afresh, with a view to her future operations among islands in the Pacific, where worms would soon eat through places on a vessel's bottom from which sheets of copper had been torn away. At this time the Adventure's copper was complete, but thin, and as the carpenters said it would not last above two years more with certainty, I determined to copper her forthwith, and make one substantial refit do for all. Here, to my great regret, Mr Hamond decided to return to England, and we consequently lost a valuable member of our small society.

On the 17th, having engaged men and purchased plank, copper, provisions and other necessities, we sailed from Monte Video, and next morning anchored in Maldonado. As soon as a part of our cargo was landed – all that was then wanted by the working party on Gorriti, under Mr Chaffers – we proceeded up the river to fill water, anchored again off Monte Video for a short time, and returned to our future consort at Gorriti (24th). Preparations were then commenced for heaving the schooner down to copper her. We hauled her alongside, and on the 28th hove her 'keel out,' for a few hours, and righted her again at dark. While standing on her keel, examining the state of her copper and planking, I saw a sail in the offing, which was soon made out to be the *Constitucion*, and just after we righted the schooner Lieut. Wickham came alongside. He brought good tidings – without drawback – and those who know what it is to feel anxiety for the safety of friends whose lives are risked by their willingness to follow up the plans of their commanding officer – however critical those plans may be – will understand my sensations that night. The *Constitucion* anchored off the Negro on the 11th, entered it next day, found the Paz and Liebre there, and on the 17th sailed again. Six knots and a-half an hour was the most she could accomplish under any circumstances, yet her passages were very good, considering the distance. During June we remained in Maldonado, employed about the Adventure, and refitting as well as painting our own ship. Meanwhile Mr Darwin was living on shore, sometimes at the village of Maldonado, sometimes making excursions into the country to a considerable distance; and my own time was fully occupied by calculations and chart-work, while the officers attended to heaving down the Adventure. This process, in a place partly exposed to south-west winds, was extremely tedious, and had it not been for the great advantages Maldonado and Gorriti offered in other respects, the situation might have been deemed exceedingly ill-chosen for such a purpose. Only when there was no swell could we haul her alongside and heave her down (an operation under any circumstances difficult, as she was one hundred and seventy tons in burthen, and we were but two hundred and thirty-five) and many days sometimes intervened on which no progress could be made. Every morning, at dawn of day, Lieut. Sullivan and I used to watch the sky most anxiously, in order to know whether it would be



worth while unmooring, and warping the vessels together, and as the indications we looked for never deceived us, I will here mention them. Though familiar to all who lead a country or seafaring life, and often rise before the sun, they may be of use to others, whose attention has not been drawn to 'weather wisdom'.

When the first streak of light appeared close to the horizon, and the sun's rising was preceded by a glow of faint red, not extending far, a fine day succeeded, whether the sky were then overcast or clear; but if the first gleam of light appeared high above the horizon, behind clouds, and there was much red, not only near the sun, but visible on clouds even near the zenith, wind, if not rain, was sure to follow. Between the extremes of course there may be many varieties of appearance as well as of succeeding weather; but as I have found such signs followed by similar weather, in most parts of the world, and as I have often profited by them, with reference to making or shortening sail, &c.; I do not like to pass over this occasion for a hint to the inexperienced. I have always found that a high dawn (explained above) and a very red sky, foretold wind – usually a gale; that a low dawn and pale sun-rise indicated fine weather; that the sun setting behind a bank of clouds, with a yellow look, was a sign of wind, if not rain, and that the sun setting in a clear horizon, glowing with red, was an unfailing indication of a coming fine day. I have already said [*Narrative 2*, p. 50], that hard-edged, oily-looking clouds, foretell, if they do not accompany wind, and that soft clouds – clouds which have a watery rather than an oily look – are signs of rain; and if ragged, or streaky, of wind also. Light foggy clouds, rising early, often called the 'pride of the morning', are certain forerunners of a fine day.

*Narrative 2* pp. 283–6

While FitzRoy worked on his charts and supervised the refitting of the *Adventure*, Darwin remained on shore, writing letters and exploring the country known as Banda Oriental, north of Maldonado. He speculates in a characteristic fashion on its natural history.

The general, and almost entire absence of trees in Banda Oriental is remarkable. Some of the rocky hills are partly covered by thickets, and on the banks of the larger streams, especially to the northward of the Las Minas, willow-trees are not uncommon. Near the Arroyo Tapes I heard of a wood of palms; and one of these trees, of considerable size, I saw near the Pan de Azucar, in lat.  $35^{\circ}$ . These, and the trees planted by the Spaniards, offer the only exceptions to the general scarcity of wood. Among the introduced kinds may be enumerated poplars, olives, peach, and other fruit-trees: the peaches succeed so well, that they afford the main supply of firewood to the city of Buenos Ayres. Extremely level countries, such as the Pampas, seldom appear favourable to the growth of trees. This may possibly be attributed either to the force of the winds, or the kind of drainage. In the nature of the land, however, around Maldonado, no such reason is apparent; the rocky mountains afford protected situations, enjoying various kinds of soil; streamlets of water are common at the bottoms of nearly every valley; and the clayey nature of the earth seems adapted to retain moisture. It has been inferred with much



probability, that the presence of woodland is determined by the annual amount of moisture; yet in this province abundant and heavy rain falls during the winter; and the summer, though dry, is not so in any excessive degree. We see nearly the whole of Australia covered by lofty trees, yet that country possesses a far more arid climate. Hence we must look to some other cause. The trees of Brazil cannot travel so far southward, on account of the colder climate; nor does there exist any other wooded country whence a migration could take place: we are therefore driven to the conclusion that herbaceous plants, instead of trees, were created to occupy that wide area, which within a period not very remote, has been raised above the waters of the sea.

Considering South America alone, we should be tempted to believe that trees could not possibly flourish, excepting in a very humid climate. The limit of the forest land certainly follows, in a most remarkable manner, that of the damp winds. In the southern part of the continent, where the western gales, charged with moisture from the Pacific, prevail, every island on the broken west coast, from lat.  $38^{\circ}$  to the extreme point of Tierra del Fuego is densely covered by impenetrable forest. On the eastern side of the Cordillera, over the same extent of latitude, where a blue sky and a fine climate prove that the atmosphere has been drained of its moisture, the arid plains of Patagonia support a scanty vegetation. Within the limits of the constant south-east trade wind, the bulk of the eastern parts of the continent is ornamented by magnificent forests: the west coast, however, from lat.  $4^{\circ}$  south to lat.  $32^{\circ}$ , may be described as a desert. In this case, as before, all the vapour has been condensed by the snow-clad pinnacles of the Andes. In these two areas, determined by the prevalent winds, the forest and desert lands occupy reversed positions with respect to the great mountain axis. Between their limits a broad intermediate band, which is neither desert nor woodland, stretches across the entire continent. Central Chile and the Provinces of La Plata are included in this division. On the west coast, about four degrees south of the equator, where the trade wind loses its regularity, and heavy torrents of rain periodically fall, the desert coast of Peru assumes near Cape Blanco the character of luxuriance so celebrated at Guayaquil and on the shores of Panama.

After these facts, it will perhaps appear a sufficient answer to the question, to state that according to the South American type of vegetation, the climate of Banda Oriental is too dry for the growth of trees. But this reasoning, I apprehend, must not be extended to a general statement including other countries. The Falklands offer a more perplexing case even than Maldonado. Situated under the same latitude with Tierra del Fuego, and only between two and three hundred miles distant from it, possessed of an entirely similar climate, with a geological formation almost identical, with favourable situations, and the same kind of peaty soil, yet these islands can scarcely boast of a plant deserving the title even of a bush; whilst in Tierra del Fuego, it is impossible to find an acre of land not covered by the densest forest. In this case, both the direction of the heavy gales of wind and of the currents of the sea are favourable to the transport of seeds. Canoes and other works of art, and trunks of trees, drifted from Tierra del Fuego, are frequently thrown on the shores of the Western Island. Hence perhaps it is that



there are many plants common to the two countries: but with respect to trees, even some attempts which have been made to transplant them, have failed.

*Narrative* 3 pp. 53-5

The Tucutuco (*Ctenomys Braziliensis*) is a curious small animal, which may be briefly described as a Rodent, with the habits of a mole. It is extremely abundant in some parts of the country, but is difficult to be procured, and still more difficult to be seen, when at liberty. It lives almost entirely under ground, and prefers a sandy soil with a gentle inclination. The burrows are said not to be deep, but of great length. They are seldom open; the earth being thrown up at the mouth into hillocks, not quite so large as those made by the mole. Considerable tracts of country are so completely undermined by these animals, that horses, in passing over, sink above their fetlocks. The tucutucos appear, to a certain degree, to be gregarious. The man who procured the specimens for me had caught six together, and he said this was a common occurrence. They are nocturnal in their habits; and their principal food is afforded by the roots of plants, which is the object of their extensive and superficial burrows. Azara says they are so difficult to be obtained, that he never saw more than one. He states that they lay up magazines of food within their burrows. This animal is universally known by a very peculiar noise, which it makes when beneath the ground. A person, the first time he hears it, is much surprised; for it is not easy to tell whence it comes, nor is it possible to guess what kind of creature utters it. The noise consists in a short, but not rough, nasal grunt, which is repeated about four times in quick succession; the first grunt is not so loud, but a little longer, and more distinct than the three following: the musical time of the whole is constant, as often as it is uttered. The name Tucutuco is given in imitation of the sound. In all times of the day, where this animal is abundant, the noise may be heard, and sometimes directly beneath one's feet. When kept in a room, the tucutucos move both slowly and clumsily, which appears owing to the outward action of their hind legs; and they are likewise quite incapable of jumping even the smallest vertical height. Mr Reid, who dissected a specimen which I brought home in spirits, informs me that the socket of the thigh-bone is not attached by a ligamentum teres; and this explains, in a satisfactory manner, the awkward movements of their hinder extremities. When eating, they rest on their hindlegs and hold the piece in their fore paws; they appeared also to wish to drag it into some corner. They are very stupid in making any attempt to escape; when angry or frightened, they uttered the tucu-tuco. Of those I kept alive, several, even the first day, became quite tame, not attempting to bite or to run away; others were a little wilder.

The man who caught them asserted that very many are invariably found blind. A specimen which I preserved in spirits was in this state; Mr Reid considers it to be the effect of inflammation in the nictitating membrane. When the animal was alive I placed my finger within half an inch of its head, and not the slightest notice was taken: it made its way, however, about the room nearly as well as the others. Considering the subterranean habits of the tucutuco, the blindness, though so frequent, cannot be a very serious evil; yet it appears strange that any animal



should possess an organ constantly subject to injury. The mole, whose habits in nearly every respect, excepting in the kind of food, are so similar, has an extremely small and protected eye, which, although possessing a limited vision, at once seems adapted to its manner of life.

*Narrative* 3 pp. 58–60

MAY 12th. We crossed the Rio Marmaraga & proceeded to the Tapes; where a widow woman, a friend of Gonzales, gave us a most hospitable reception. The above rivers ultimately flow into the R. Grande & thus belong to a different system from the others which we crossed. On the road Morante practised with success a method of catching partridges which I had often heard of but never seen; it requires a long stick, at the end of which there is a running noose, made of the stem of an Ostriche's feather. As soon as a partridge is seen – & they are wonderfully numerous – the man with the stick rides in a circle or spire round & round the bird gradually coming nearer & nearer; the partridge not knowing which way to run at last squats to conceal itself; the noose is then quietly put over its head & the bird secured by a jerk. In this manner a boy sometimes catches 30 or 40 in one day.

*Diary* p. 150

C.D. TO MISS CATHERINE DARWIN

Maldonado, Rio Plata, May 22nd 1833

My dear Catherine

Thanks to my good fortune & my good sisters I have to acknowledge the following string of letters: (August I received many months ago) September 12th, Caroline; October 14th, Catherine; November 12th Susan; December 15th, Caroline; Jan 13th Caroline. My last folio letter was dated on the sea; after being disappointed at the Rio Negro, the same foul winds & ill fate followed me to Maldonado; so that the Beagle proceeded direct to M. Video. Here we remained only one night, when I received your four first letters: I really had not time to open & alter my letter, but sent it as it was. Leaving M: Video we came directly to Maldonado – I the next day took up my residence on shore. The Beagle has not yet returned (for she went again there) from M. Video, & I know nothing of our future plans: the purchase of the Schooner has so altered every thing.

I have been living here for the last three weeks; it is [a] quiet little village, surrounded on all sides by the endless succession of green turf hills & stony ridges. I have had one little excursion which I enjoyed very much; I procured two trustworthy men & a troop of horses & have had a 12 days ride into the interior – the country continues very similar; so that one dreadfully misses the gorgeous views of Brazil. I saw however a good deal of the Gauchos; a singular race of countrymen. 'Heads gallop' gives a more faithful picture: nothing can, I think, be more spirited & just than his remarks.

Besides your letters I received several others – one from Charlotte; 2 from Fox; also one of the kindest I ever received in my life time from Mrs Williams. I was



very sorry to hear from your latter letters that she has lost so much of the Owen constitution: I am very sure that with it none of the Owen goodness has gone.

I most devoutly trust that next Summer (your winter) will be the last on this side of the Horn: for I am becoming thoroughly tired of these countries; a live *Megatherium* would hardly support my patience: the good people of Shropshire who say I shall find cruizing in the South-seas stupid work, know very little of the numberless invertebrate animals, which abound in the intertropical ocean. If it was not for these & still more for geology, I would in short times make a bolt across the Atlantic to good old Shropshire. In for penny, in for pound. I have worked very hard (at least for me) at Nat. History, & have collected many animals & observed many geological phenomena: I think it would be a pity, having gone so far, not to go on & do all in my power in this my favourite pursuit; & which I am sure will remain so, for the rest of my life.

The following business piece is to my Father: having a servant of my own would be a really great addition to my comfort – for these two reasons; as at present the Captain has appointed one of the men always to be with me, but I do not think it just thus to take a seaman out of the ship; & 2nd when at sea, I am rather badly off for anyone to wait on me. The man is willing to be my servant, & *all* the expences would be under sixty £ per annum. I have taught him to shoot & skin birds, so that in my main object he is very useful. I have now left England nearly  $1\frac{1}{2}$  years: & I find my expences are not above 200£ per annum: so that it being hopeless to write for permission, I have come to the conclusion you would allow me this expence. But I have not yet resolved to ask the Captain: & the chances are even that he would not be willing to have an additional man in the ship. I have mentioned this, because for a long time I have been thinking about it.

June. I have just received a bundle more letters. I do not know how to thank you all sufficiently: one from Catherine Feb 8th; another from Susan March 3d; together with notes from Caroline & from my Father; give my best love to my Father: I almost cried for pleasure at receiving it – it was very kind, thinking of writing to me. My letters are both few, short, & stupid in return for all yours; but I always ease my conscience by considering the Journal as a long letter. If I can manage it, I will before doubling the Horn send the rest.

I am quite delighted to find the hide of the *Megatherium* has given you all some little interest in my employments. These fragments are not however by any means the most valuable of the Geological relics. I trust & believe that the time spent in this voyage, if thrown away for all other respects, will produce its full worth in Nat: History; and it appears to me, the doing what *little* one can to encrease the general stock of knowledge is as respectable an object of life as one can in any likelihood pursue. It is more the result of such reflections (as I have already said) than much immediate pleasure, which now makes me continue the voyage: together with the glorious prospect of the future, when passing the Straits of Magellan, we have in truth the world before us. Think of the Andes; the luxuriant forest of the Guayquil; the islands of the South Sea & New South Wales. How many magnificent & characteristic views, how many & curious tribes of men we shall see, what fine opportunities for geology & for studying the infinite host of



living beings: is not this a prospect to keep up the most flagging spirit? If I was to throw it away, I don't think I should ever rest quiet in my grave; I certainly should be a ghost & haunt the Brit: Museum.

How famously the Ministers appear to be going on. I always much enjoy political gossip, & what you at home think will &c &c take place. I steadily read up the weekly Paper; but it is not sufficient to guide one's opinion: & I find it a very painful state not to be as obstinate as a pig in politics. I have watched how steadily the general feeling, as shown at elections, has been rising against Slavery. What a proud thing for England, if she is the first European nation which utterly abolishes it. I was told before leaving England, that after living in Slave countries, all my opinions would be altered; the only alteration I am aware of is forming a much higher estimate of the Negro character – it is impossible to see a negro & not feel kindly towards him; such cheerful, open, honest expressions & such fine muscular bodies; I never saw any of the diminutive Portuguese with their murderous countenances, without almost wishing for Brazil to follow the example of Hayti; & considering the enormous healthy looking black population, it will be wonderful if at some future day it does not take place. There is at Rio a man (I know not his title) who has [a] large salary to prevent (I believe) the landing of slaves: he lives at Botofogo, & yet that was the bay, where during my residence the greater number of smuggled slaves were landed. Some of the Anti-Slavery people ought to question about his office: it was the subject of conversation at Rio amongst some of the lower English.

June 19th. I write this letter by patches: I have just spent a day on board to see old Wickham, who has returned from his little hired Schooner to be Captain of the new one. This same Schooner will produce the greatest benefits to me. The Captain, always anxious to make everybody comfortable, has given me all Stokes (who will be in the Schooner) drawers in the Poop Cabin, & for the future nobody will live there except myself. I absolutely revel in room: I would not change berths with anyone in the Ship. The cause of our very long delay here is coppering the Schooner; as soon as this is finished the Beagle will go for a month to R. Negro, return to the R. Plata, & take in provisions for the whole summer. The Captain is anxious to then be able to pass on to Concepcion on the other side. I am ready to bound for joy at the thoughts of it – Volcanic plains: beds of coal: lakes of nitre: & the Lord only knows what more. If this was certain, I would hatch a grand plan, viz of now remaining behind, & posting up to B. Ayres; I heard of so many curious things there; per contra at R. Negro cliffs almost built of fossil shells. Was ever a Philosopher (my standard name on board) placed between two such bundles of Hay? The worst of it is the B.A. bundle is rather expensive, & nearly all the 70£ is gone in paying what I owed, & in my long residence here. And then the mere reading the sum total from July 31 to 32 [June 1832–June 1833] is enough to give one an indigestion: what it must have been to have paid it, I don't know: I shall go on board in a week's time & then I shall know more.

[July] 6th. I am now living on board. The packet has just come in; but no letters for poor me; I have no right to growl, for I suppose the Capt. Beaufort parcel has robbed this month, & Farewell for the future to regular correspondence. You



must direct hereafter to Valparayso. Our plans are (always winds & waves permitting) to go for a month to the banks off the R. Negro, return to the Plata; find the Schooner ready, take in at M. Video one years provisions, & hark away to the land of storms; in the Autumn (your Spring) pass the Straits of Magellan. I am ready to bound for joy at this prospect. I long to bid adieu to the Atlantic. Already I almost fancy to see, through a long vista of storms, the blue sky of the Tropics. I wrote the other day to Mr Hughes at B. Ayres, & I am sorry to hear he has left that place, chiefly from ill health. I have asked the Captain & obtained his consent respecting a servant – but he has saved me much expence by keeping him on the books for victuals & will write to Admiralty for permission, so that it will not be much more than 30£ per annum. I shall now make a fine collection in birds & quadrupeds, which before took up far too much time. We here got 80 birds & 20 quadrupeds. Tell Caroline to thank Charlotte very much for writing to me. When we are on the other side, I shall have more to say, & will then write to thank her. I have lost all interest in this part of America, & I feel more inclined to growl than write civilly to any-body.

July 14th. We have just had a trip to M: Video, & in a few days go Southwards. I received a letter of Caroline. May 1st – my last was the Beaufort parcel in March; the April one alas is lost: *Excepting* when the letters are sent from *home*, remember the 3s. 6d. is temptation for any body to tear up the letter. By the same packet which takes this, the rest of my journal will arrive, through Capt. Beaufort – so if it does not come, you will know where to enquire about it. The journal latterly has not been flourishing, for there is nothing to write about in these well-known uninteresting countries. The letter ought to have made as it were two distinct ones: but when living on shore, I did not hear of conveyance to M. Video. Once more I must thank you all for writing: it is so very delightful having a regular correspondence. Give my love to my Father & Erasmus & all of you: God bless you all, my dear Katty:

your most affectionately  
Chas Darwin

P.S. When you read this I am afraid you will think that I am like the Midshipman in Persuasion, who never wrote home, excepting when he wanted to beg; it is chiefly for more books; those most valuable of all valuable things: 'Fleming's philosophy of Zoology' & 'Pennant's Quadrupeds' – these I have at home: 'Davys consolation on Travel': 'Scoresby Arctic regions': 'Playfair & Hutton, Theory of the earth': 'Burchell's travels': 'Paul Scroope on Volcanoes': a pamphlet by T. Dalzell – 'Observations on the Planariae, Edinburgh': Caldcleugh 'travels in S. America'. If any of these books are expensive, strike them out. Tell Erasmus I shall be very much obliged, if with my Father's consent he will undertake the commission. If the 8th Vol. of Humboldt or Sedgwick & Conybeares geological book is out, I should like them both. You people at home cannot appreciate the exceeding value of Books. Cary has 3s. 6d. tape measure of about 1½ feet. I have lost mine. I have at present a double convex lens, fitted to the object-glass, & about one inch in diameter: now I want one on a larger scale & with longer focal distance for illuminating opaque objects: it must be fixed on a



stand & with plenty of motions. I want to use it by placing it near the Microscope, & thus have steady light on opaque objects. I daresay an Optician must have made some such contrivance. Also another box of Promethians (I blush like this red ink when I ask for it), but the Natives here are so much astounded at them that I have wasted a great many – & lastly 4 pairs of very strong walking shoes from Howell, if he has my measure – it is impossible to procure them in this country. I guess, as the Yankys say, this [is] a pretty considerable tarnation impudent Postscript: I have no doubt Capt. Beaufort will undertake to forward the box to Valparaiso.

*Letters* I pp.244–6 [in part]; *Darwin and Beagle* pp.84–90

R.F. TO CAPTAIN BEAUFORT, PRIVATE

H.M.S. Beagle, Maldonado. 7th June 1833

Dear Captain Beaufort,

I cannot omit an opportunity of telling you how we are going on, though I have no 'Documents' ready for you yet.

Lieut Wickham arrived here on the 28th May having left Mr Stokes in charge of the hired schooners at the Rio Negro. Two days after our arrival in the River Plate, at the beginning of May, I sent Mr Usborne (Mast. Asst) in a small Schooner, of thirteen tons burthen, to look for & bring Lt Wickham to take command of the Unicorn, and to give Mr Stokes charge of the other two craft. In my letter from Monte Video I said that our little detachment was doing well; but I can now say that it has succeeded extremely well, and far beyond my expectations. On the 18th of May Lt W. sailed from the Rio Negro to join the Beagle, and Mr Stokes to continue the survey northward of that River. In those *cockleshells* (for now that they have succeeded I will tell you their size) – one of fifteen & the other of only *nine* tons – the Coast between Port Desire and Bahia Blanca has been explored *satisfactorily*, and when you see the new Charts, you will say 'I had no Idea there remained so much to be done on that Coast.' Their work has been confined to the immediate vicinity of the land; there is still work for the Beagle near tide races and outlying shoals. They have found a new River called by the Indians 'Chubat' in Lat.  $43^{\circ}20'$  S. Long.  $65^{\circ}15'$  W., which though not large nor deep, is rapid & flows through a most fertile country with so winding a course that a succession of Islands, or 'water meadows', might be formed by canals, thus

which would be at the same time

fortified against the Indians, who never cross water in their attacks upon civilized man. Lt Wickham says the river is about 100 yards wide, and will admit vessels of thirty tons burthen.

In *New Bay* there are excellent anchorages fit for a Ship to run for in a SE Gale (the worst wind on this Coast), when hardly a Port is accessible. The Labyrinth between San Blas & Bahia Blanca is partly finished. Mr Stokes is now working at that part. Off the 'Islas de la Confusion', the aforesaid Labyrinth, there are shoals, out of sight of land, & extremely dangerous. In the Beagle, although so small, we *could* not have overhauled these places so well, nor half so quickly, as the



And a certain troubled Spirit, ycleped Conscience, is always goading me to do all I can, for the sake of doing what is *right*, without seeking for credit, or being cast down because every one does not see things in the same light. These are some of the reasons which occasioned my outgoings. What is *now* left undone, will long be neglected. Not only the character of those actually engaged in the Survey will suffer, but the credit of the English as Surveyors will be injured.

My soaring ideas respecting the River Negro have received a sad check from Lieut Wickham, who tells me that the current is always so rapid as to render Navigation extremely difficult above the Settlement (20 miles from the mouth), and that there are many banks, shoals, rapids, and sunken trees. I hear also that the *Journal* of a *Spanish* expedition up that river is extant at Buenos Ayres, and I have procured a Map, on which the track of Villarino, the Officer who commanded that expedition, is laid down. The old Spaniard (mentioned by my formerly) who was one of that party, says that they were more than eight months in going and returning, that the banks of the river were then inhabited by vast numbers of Indians, and that *all* those Indians were then *friendly* and *assisted* their progress.

At *this* moment the army of the United Province of Rio de la Plata occupies the northern bank, while the unfortunate and now harassed Indians are endeavouring to keep possession of the Southern side. A War of Extermination appears to be the object of the *liberal* and *independent* Creoles. Every Indian is their inveterate enemy, and if our boats were to attempt now to ascend the river, they would undoubtedly be attacked and probably destroyed. Ergo – I must, for the present, abandon my hopes of going in that direction.

It is a curious fact, that while the Spaniards held the country, these *Southern* Indians were extremely well disposed towards the white intruders, and received them with the utmost hospitality. Since the *Revolution* (what a *glorious sound*) the most determined hostility has been increasing.

Did not the kind cautions contained in your letter of the 9th March almost amount to a prohibition? You set too much value upon us.

Thanks for the Map. It will prove useful.

In future will you consider Valparaiso the depot for letters &ca for the Beagle. The care of the British Consul is also preferable to that of a Senior Officer, who is generally a bird of passage, & now & then carries the letter bags to sea, for a cruise.

If any one who honors me by an *original* thought should cross your path, will you say that I am *most* conscious of my deficiencies as a correspondent, and humbly beg their forgiveness. In time I will pay all. I cannot go very fast, being but a Beagle; but at the end I trust that the animal will have maintained its other Characteristicks.

If other trades fail, when I return to old England (if that day ever arrives) I am thinking of raising a crusade against the Slavers! Think of *Monte Video* having sent out *four Slavers!!!* Liberal and enlightened Republicans! – and their Prime Minister '*Vasquez*' has been bribed by 30,000 dollars to wink at the violation of their *adored Constitution!!* The '*Adventure*' will make a good Privateer!!



Farewell for a short time, my dear Sir, while I run to the Rio Negro.

Your's most faithfully and respectfully,

Robt FitzRoy

[from the archives of the Hydrographic Department, Taunton]

C.D. TO PROFESSOR HENSLOW

Rio de la Plata, July 18th 1833, H.M.S. Beagle

My dear Henslow,

My last letter was dated on the sea. I then expected to stop at the R. Negro in Patagonia; our domineering master, the wind, ordered otherwise; in consequence the greater part of this winter has been passed in this river at Maldonado. Amongst a heap of letters which awaited me, I was sadly disappointed not to see your hand-writing: for several months I had been looking forward with no little pleasure to hearing how you all are going on at Cambridge, & with a good deal of anxiety respecting the fate of my collections. Our direction, for a long period hence, will be Valparaiso: I should be so much obliged if you would write to me. You only know anything about my collections, & I feel as if all future satisfaction after this voyage will depend solely upon your approval. I am afraid you have thought them very scanty; but, as I have said before, you must recollect how much time is lost at sea, & that I make it a constant rule to prefer the obscure & diminutive tribes of animals. I have now got a servant of my own, whom I have taught to skin birds etc, so that for the future I trust, there will be rather a larger proportion of showy specimens. We have got almost every bird in this neighbourhood (Maldonado), about 80 in number & nearly 20 quadrupeds. But, alas, excepting this, there has not been much done.

By the same packet which takes this there will come four barrells: the largest will require opening, as it contains skins, Plants etc etc, & cigar box with pill boxes: the two next in size, only Geological specimens, need not be opened, without you like to see them, the smallest & flat barrell contains fish; with a gimlet you can easily ascertain how full it is of spirits. Several of the pill-boxes are marked thus (X), they contain Coleoptera, & will require (as likewise the case) airing & perhaps a little Essential oil. This is not nearly all which I have collected this summer, but for several reasons I have deferred sending the other half. It is useless attempting to thank you for taking charge of my collections: for as I know no other person who would; this voyage would then be useless & I would return home.

Our future plans are, in a few days to go to the R. Negro, to survey some banks. I shall be put on shore: I wish we could remain there for a long time. The geology must be very interesting – it is near the junction of the Megatherium & Patagonian cliffs. From what I saw of the latter in one half hour in St Josephs bay, they would be well worth a long examination – above the great Oyster bed, there is one of gravel, which fills up inequalities in its interior; & above this, & therefore high out of the water is one of such modern shells, that they retain their



colour & emit bad smell when burnt. Patagonia must clearly have but lately risen from the water. After the Beagle returns from this short cruize, we take in 12 months provisions & in beginning of October proceed to Tierra del F., then pass the Straits of Magellan & enter the glorious Pacific: The Beagle after proceeding to Conception or Valparaiso, will once more go Southward, (I however will not leave the warm weather) & upon her return we proceed up the coast, ultimately to cross the Pacific. I am in great doubt whether to remain at Valparaiso or Conception: at the latter beds of Coal & shells, but at the former I could cross & recross the grand chain of the Andes. I am ready to bound for joy at the thoughts of leaving this stupid, unpicturesque side of America. When Tierra del F is over, it will all be Holidays. And then the very thoughts of the fine Corals, the warm glowing weather, the blue sky of the Tropics is enough to make one wild with delight. I am anxious to know, what has become of a large collection (I fancy ill assorted) of Geological specimens made in former voyage from Tierra del Fuego.

I hope to see enough of this country to be able to make a rough sketch of it – & then of course specimens with localities marked on them, would be to me very valuable. Remember me most kindly to Prof. Sedgwick, perhaps he would enquire at Geol: Soc: whether they are in existence. Somebody told me you had Volume of Dic Class: Explan: of Plates. My brother will in short time send me a parcel: by which it can come: his direction is Whyndham Club, St James Square. If you know of any book, which would be useful to me, you can mention it to him. I trust I shall find a letter (although it is a long time to look forward to) at Valparaiso; I shall be so glad to hear what you are doing. Very often during your last Spring when the weather has been fine; I have been guessing whether it would do for Gamlingay or whether at the very instant some revered Botanist was not anxiously looking at the *other* side of a fenny ditch. The only piece of Cambridge news which I have heard for a long time was a good one; it was that a Living has been given to you. I hope it is true. Remember me most truly to Mrs Henslow & to Leonard Jennings. Believe me My dear Henslow

Your most obliged & affectionate friend

Chas Darwin

*Darwin & Henslow* pp.74-7

On July 24th the *Beagle* left the River Plate to complete her survey of the coast of Patagonia south of Bahia Blanca. Darwin was landed on the north bank of the River Negro to indulge in more 'shore-roving', as FitzRoy termed it. On August 11th he set out on horseback to visit the camp on the River Colorado of the Argentinian army engaged in a campaign against the Araucanian Indians.

AUG. 11th. We started early in the morning, but owing to some horses being stolen we were obliged to travel slow & accompany the Cargeroes or loaded horses. The distance between Patagones & the pass of the Colorado is 85 miles, & in all this distance there are only two springs of fresh water. They are called fresh, but even at this season were very brackish. In summer this must be a very disagreeable passage; from the heavy rain of yesterday we were well off, for there



were several small puddles in the waggon ruts. We passed several small Salinas & in the distance there was one which was at least 3 or 4 leagues in length. The country has one universal appearance: brown withered grass & spiny bushes; there are some depressions & valleys.

Shortly after passing the first spring we came in sight of the famous tree, which the Indians reverence as a God itself, or as the altar of Walleechu. It is situated on a high part of the plain & hence is a landmark visible at a great distance. As soon as a tribe of Indians come in sight they offer their adorations by loud shouts. The tree itself is low & much branched & thorny; just above the root its apparent diameter is 3 feet. It stands by itself without any neighbour, & was indeed the first tree we met with; afterwards there were others of the same sort, but not common. Being winter the tree had no leaves, but in their place were countless threads, by which various offerings had been suspended. Cigars, bread, meat, pieces of cloth &c. &c. Poor people only pulled a thread out of their ponchos. The Indians both pour spirit & mattee into a hole & likewise smoke upwards, thinking thus to afford all possible gratification to Walleechu. To complete the scene the tree was surrounded by the bleached bones of horses slaughtered as sacrifices. All Indians of every age & sex make their offerings; they then think that their horses will not tire & that they shall be prosperous. In the time of peace, the Gauchos who told me this had been witnesses of the scene; they used to wait till the Indians passed on & then steal from Walleechu their offerings. The Gauchos think that the Indians consider the tree itself is a God; but it seems far more probable that it is an altar. The only cause which I can imagine for this choice, is its being a landmark in a dangerous passage. The Sierra de la Ventana is visible at an immense distance & a Gaucho told me that he was once riding with an Indian a few miles to the North of the R. Colorado, when the latter began making the same noise which is usual at the first sight of the tree, & putting his hand to his head & then in the direction of the Sierra. Upon being asked the reason of this, the Indian said in broken Spanish 'first see the Sierra'. This likewise would render it probable that the utility of a distant landmark is the first cause of its adoration.

About two leagues from this very curious tree we halted for the night: at this instant an unfortunate cow was spied by the lynx-eyed Gauchos. Off we set in chase, & in a few minutes she was dragged in by the lazo & slaughtered. We here had the four necessities for life 'en el campo' – pasture for the horses, water (only a muddy puddle) meat & firewood. The Gauchos were in high spirits at finding all these luxuries, & we soon set to work at the poor cow. This was the first night which I passed under the open sky with the gear of a Recado for a bed. There is high enjoyment in the independence of the Gauchos' life: to be able at any moment to pull up your horse, & say, Here we will pass the night. The death-like stillness of the plain, the dogs keeping watch, the gipsy-group of Gauchos making their beds around the fire, has left in my mind a strongly marked picture of this first night, which will not soon be forgotten.



AUG. 15th. General Rosas sent a message that he should be glad to see me before I started, by this means I lost a day, but subsequently his acquaintance was of the greatest utility. General Rosas is a man of an extraordinary character; he has at present a most predominant influence in this country & probably may end by being its ruler. He is said to be owner of 74 square leagues of country & has about 300,000 cattle. His Estancias are admirably managed, & are far more productive of corn than any others in the country. He first gained his celebrity by his laws for his own Estancia & by disciplining several hundred workmen or Peons, so as to resist all the attacks of the Indians. He is moreover a perfect Gaucho: his feats of horsemanship are very notorious. He will fall from a doorway upon an unbroken colt, as it rushes out of the Corral, & will defy the worst efforts of the animal. He wears the Gaucho dress & is said to have called upon Lord Ponsonby in it, saying at the same time he thought the costume of the country the proper & therefore most respectful dress. By these means he has obtained an unbounded popularity in the Camp, and in consequence despotic power. A man a short time since murdered another; being arrested & questioned he answered, 'the man spoke disrespectfully of General Rosas & I killed him'; in one week's time the murderer was at liberty. In conversation he is enthusiastic, sensible, & very grave. His gravity is carried to a high pitch. I heard one of his mad buffoons (for he keeps two like the Barons of old) relate the following anecdote. 'I wanted very much to hear a piece of music, so I went to the General two or three times to ask him; he said to me, "go about your business for I am engaged". I went again; he said, "If you come again I will punish you." A fifth time I asked him & he laughed. I rushed out of the tent, but it was too late; he ordered two soldiers to catch & stake me. I begged by all the Saints in Heaven he would let me off; but it would not do. When the General laughs he never spares mad man or sound man.' The poor flighty gentleman looked quite dolorous at the very recollection of the staking. This is a very severe punishment; for posts are driven into the ground, & the man is extended by his arms & legs horizontally, & there left to stretch for several hours. The idea is evidently taken from the usual method of drying hides. My interview passed away without a smile & I obtained what I wanted, a passport & order for the government post horses, & this he gave me in the most obliging & ready manner. When General Rosas, some months since, left Buenos Ayres with his army, he struck in a direct line across the unknown country, & in his march left at wide intervals a posta of 5 men with a small troop of horses, so as to be able to send expresses to the Capital. By these I travelled to Bahia Blanca & ultimately to Buenos Ayres. I was altogether pleased with my interview with the terrible General. He is worth seeing, as being decidedly the most prominent character in S. America.



R.F. TO C.D.

Beagle, Saturday, 24th [August] off M. Megatherii

My dear Philos,

Trusting that you are not entirely expended – though half starved, occasionally frozen, and at times half drowned – I wish you joy of your campaign with Genl Rosas; and I do assure you that whenever the ship pitches (which is *very* often as you *well* know), I am extremely vexed to think how much *sea practice* you are losing – and how unhappy you must feel upon the firm ground.

Your home (upon the waters) will remain at anchor near the Montem Megatherii until you return to assist in the parturition of a Megalonyx measuring seventy two feet from the end of his snout to the tip of his tail – and an Ichthyosaurus somewhat larger than the Beagle. Our wise ones say that you are not enough of an Archimedes to accomplish the removal of this latter animalcule.

I have sent, by Chaffers, to the Commandant, on *your* account, and on behalf of *our* intestines, which have a strange inclination to be interested in beef.

If you have already departed for the Sierra Ventana – tanto mejor – I shall stay here, at the old trade, 'quarter-er-less four'.

Sancho goes with Chaffers, in case you should require his right trusty services.

Send word when *you* want a boat – *we* shall send, *once* in four days.

Take your own time – there is abundant occupation here for *all* the *Sounders*, so we shall not growl at you when you return.

Yours very truly,  
Robt FitzRoy

[Cambridge University Library, Darwin MS. DAR/2/-]

Darwin rode back to Bahia Blanca to await the return of the *Beagle*. On this, as on earlier occasions, the cliffs at Punta Alta proved to be a happy hunting ground for fossils.

At Punta Alta, a low cliff, about twenty feet high, exposes a mass of partly consolidated shingle, irregularly interstratified with a reddish muddy clay, and containing numerous recent shells. We may believe a similar accumulation would now take place, on any point, where tides and waves were opposed. In the gravel a considerable number of bones were embedded. Mr Owen, who has undertaken the description of these remains, has not yet examined them with care; but the following list may give some idea of their nature: 1st, a tolerably perfect head of a megatherium, and a fragment and teeth of two others; 2d, an animal of the order Edentata, as large as a pony, and with great scratching claws; 3d and 4th, two great Edentata related to the megatherium, and both fully as large as an ox or horse; 5th, another equally large animal, closely allied or perhaps identical with the Toxodon (hereafter to be described), which had very flat grinding teeth, somewhat resembling those of a rodent; 6th, a large piece of the tessellated covering like that of the armadillo, but of gigantic size; 7th, a tusk which in its prismatic form, and in the disposition of the enamel, closely resembles that of the African boar; it is probable that it belonged to the same animal with the singular



flat grinders. Lastly, a tooth in the same state of decay with the others: its broken condition does not allow Mr Owen, without further comparison, to come to any definite conclusion; but the part that is perfect, resembles in every respect the tooth of the common horse. All these remains were found embedded in a beach which is covered at spring tides; and the space in which they were collected could not have exceeded one hundred and fifty yards square. It is a remarkable circumstance that so many different species should be found together; and it proves how numerous in kind the ancient inhabitants of this country must have been.

At the distance of about thirty miles, in another cliff of red earth, I found several fragments of bones. Among them were the teeth of a rodent, much narrower, but even larger than those of the *Hydrochærus capybara*; the animal which has been mentioned as exceeding in dimensions every existing member of its order. There was also part of the head of a *Ctenomys*; the species being different from the Tucutuco, but with a close general resemblance.

The remains at Punta Alta were associated, as before remarked, with shells of existing species. These have not as yet been examined with scrupulous care, but it may be safely asserted, that they are most closely similar to the species now living in the same bay: it is also very remarkable, that not only the species, but the proportional numbers of each kind, are nearly the same with those now cast up on the pebble beaches. There are eleven marine species (some in an imperfect state), and one terrestrial. If I had not collected living specimens from the same bay, some of the fossils would have been thought extinct; for Mr Sowerby, who was kind enough to look at my collection, had not previously seen them. We may feel certain that the bones have not been washed out of an older formation, and embedded in a more recent one, because the remains of one of the Edentata were lying in their proper relative position (and partly so in a second case); which could not have happened, without the carcass had been washed to the spot where the skeleton is now entombed.

We here have a strong confirmation of the remarkable law so often insisted on by Mr Lyell, namely, that the 'longevity of the species in the mammalia, is upon the whole inferior to that of the testacea'. When we proceed to the southern part of Patagonia, I shall have occasion to describe the case of an extinct camel, from which the same result may be deduced.

From the shells being littoral species (including one terrestrial), and from the character of the deposit, we may feel absolutely certain that the remains were embedded in a shallow sea, not far from the coast. From the position of the skeleton being undisturbed, and likewise from the fact that full-grown serpulæ were attached to some of the bones, we know that the mass could not have been accumulated on the beach itself. At the present time, part of the bed is daily washed by the tide, while another part has been raised a few feet above the level of the sea. Hence we may infer, that the elevation has here been trifling, since the period when the mammalia, now extinct, were living. This conclusion is in harmony with several other considerations (such as the recent character of the beds underlying the Pampas deposit), but which I have not space in this work to enter on.



From the general structure of the coast of this part of South America, we are compelled to believe, that the changes of level have all (at least of late) been in one direction, and that they have been very gradual. If, then, we look back to the period when these quadrupeds lived, the land probably stood at a level, less elevated only by a few fathoms than at present. Therefore, its general configuration since that epoch cannot have been greatly modified; a conclusion which certainly would be drawn from the close similarity in every respect, between the shells now living in the bay (as well as in the case of the one terrestrial species) with those which formerly lived there.

*Narrative* 3 pp.95-8

A passage from the *Diary* referring to the horse's tooth, although dated September 4th-7th, must have been entered at least a month later, for Darwin did not reach Santa Fe until October 2nd.

I saw one day a soldier striking fire with a piece of flint; which I immediately recognized as having been a part of the head of an arrow. He told me it was found near the island of Churichoel, & that they were frequently picked up there. It was between two & three inches long, & therefore twice as large as those used in Tierra del Fuego; it was made of opaque cream-coloured flint, but the point & barbs had been intentionally broken off. It is well known that no Pampas Indians now use bows & arrows; I believe a small tribe in Banda Oriental must be excepted, but they are widely separated from the Pampas Indians & border close to those tribes which inhabit the forest & live on foot. It appears therefore to me that these heads of arrows are antiquarian relics of the Indians before the great changes in habit consequent on the introduction of horses into South America. This & the invention of catching animals with the balls, would certainly render the use of arrows in an open country quite superfluous. In N. America bones of horses have been found in close proximity to those of the Mastodon; and I at St Fe Bajada found a horse's tooth in the same bank with parts of a Megatherium; if it had not been a *horse's* tooth, I never should have for an instant doubted its being coeval with the Megatherium. Yet the change of habits, proved by the frequency of the arrow heads, convinces me that the horse was not an original inhabitant.

*Diary* pp.173-4

Darwin's comments on the area include the following passages:

I have several times alluded to the surface of the ground being incrustated with salt. This phenomenon is quite different from that of the salinas, and much more extraordinary. In many parts of South America, wherever the climate is moderately dry, these incrustations occur; but I have nowhere seen them so abundant as near Bahia Blanca. The salt here consists of a large proportion of sulphate of soda mixed with a very little of the common muriate. As long as the ground remains moist in these salitrales (as the Spaniards improperly call them, mistaking this substance for saltpetre), nothing is to be seen but an extensive plain



composed of a black, muddy soil, supporting scattered tufts of succulent plants. I was therefore much surprised, after a week's hot weather, when I first saw square miles of country, that I had previously ridden over in the former condition, white, as if from a slight fall of snow which the wind had heaped up into partial drifts. This latter appearance is chiefly due to the tendency which the salt has to crystallize, like hoar-frost, round the blades of grass, stumps of wood, or on the top of the broken ground, in lieu of the bottoms of the puddles of water. The salinas, as a general rule, occur in depressions on the more elevated plains; the salitrales, either on level tracts elevated a few feet above the level of the sea, and appearing as if lately inundated, or on alluvial land bordering rivers. In this latter case, although I am not absolutely certain, I have strong reasons for believing that the salt is often removed by the waters of the river, and is again reproduced. Several circumstances incline me to think that the black, muddy soil, generates the sulphate of soda. The whole phenomenon is well worthy the attention of naturalists: what can be more singular than thus to see square miles of country thinly crusted over with Glauber salt? It may be asked whether plants do not decompose the muriate of soda? but whence comes the sulphuric acid? In Peru, nitrate of soda occurs in beds far thicker than these of the sulphate. Both cases are equally mysterious. I suspect that, as a general rule, the salts of soda are infinitely more common in South America than those of potash.

*Narrative* 3 pp.91-2

Of reptiles there are many kinds: one snake (a *Trigonocephalus*, or more properly a *Cophias*), from the size of the poison channel in its fangs, must be very deadly. Cuvier, in opposition to some other naturalists, makes this a sub-genus of the rattlesnake, and intermediate between it and the viper. In confirmation of this opinion, I observed a fact, which appears to me very curious and instructive, as showing how every character, even though it may be in some degree independent of structure, has a tendency to vary by slow degrees. The extremity of the tail of this snake is terminated by a point, which is very slightly enlarged; and as the animal glided along, it constantly vibrated the last inch; and this part striking against the dry grass and brushwood, produced a rattling noise, which could be distinctly heard at the distance of six feet. As often as the animal was irritated or surprised, its tail was shaken; and the vibrations were extremely rapid. Even as long as the body retained its irritability, a tendency to this habitual movement was evident. This *Trigonocephalus* has, therefore, in some respects the structure of *Vipera*, with the habits of a *Crotalus*; the noise, however, being produced by a simpler device. The expression of this snake's face was hideous and fierce; the pupil consisted of a vertical slit in a mottled and coppery iris; the jaws were broad at the base, and the nose terminated in a triangular projection. I do not think I ever saw any thing more ugly, excepting, perhaps, in some of the vampire bats. I imagine this repulsive aspect originates from the features being placed in positions, with respect to each other, somewhat proportional to those of the human face; and thus we obtain a scale of beauty.

Amongst the Batrachian reptiles, I found only one little toad, which was most



singular from its colour. If we imagine, first, that it had been steeped in the blackest ink, and then when dry, allowed to crawl over a board, freshly painted with the brightest vermilion, so as to colour the soles of its feet and parts of its stomach, a good idea of its appearance will be gained. If it is an unnamed species, surely it ought to be called *diabolicus*, for it is a fit toad to preach in the ear of Eve. Instead of being nocturnal in its habits, as other toads are, and living in damp obscure recesses, it crawls during the heat of the day about the dry sand-hillocks and arid plains, where not a single drop of water can be found. It must necessarily depend on the dew for its moisture; and this probably is absorbed by the skin, for it is known, that these reptiles possess great powers of cutaneous absorption. At Maldonado, I found one in a situation nearly as dry as at Bahia Blanca, and thinking to give it a great treat, carried it to a pool of water; not only was the little animal unable to swim, but, I think, without help would soon have been drowned.

*Narrative* 3 pp. 114-15

Armed with a passport from General Rosas to obtain horses at the government Postas, Darwin set out on September 8th to ride the four hundred miles to Buenos Aires.

Shortly afterwards [September 11th] we perceived by the cloud of dust that a party of horsemen were approaching; my companions perceived at a great distance by the streaming hair that they were Indians. The Indians often have a narrow fillet round their heads, but never any covering; the long black hair blowing across their faces, heightens to an uncommon degree the wildness of their appearance. They turned out to be a part of Bernantio's tribe going to Salina for salt. The Indians eat much salt, the children sucking it like sugar; it is a curious contrast with the Gauchos, who living the same life, eat scarcely any. My companions seemed to think there was not the slightest danger in meeting these gentlemen, & they know best; but I heard the Commandante of Bahia Blanca tell one of our officers, that he thought it unsafe for two or three to visit them, although they are professedly the most friendly Indians.

*Diary* p. 177

SEPT. 19th. This is a nice scattered little town, with many gardens, full of peaches and quinces. The camp here looked like that around Buenos Ayres; the turf short & green (from the grazing & manuring by cattle?) with much clover, beds of thistles & Biscatche holes. I first noticed here two plants which Botanists say have been introduced by the Spaniards. Fennel, which grows in the greatest abundance in all the hedge-rows; & a thistle looking plant, which, especially in Banda Oriental, forms immense beds leagues in extent, & quite impenetrable by man or beast; it occurs in the most unfrequented places near Maldonado; in the vallies near Rozario, in Entre Rios, &c. &c. The whole country between the Uruguay & M. Video is choked up with it; yet Botanists say it is the common artichoke, run wild. An intelligent farmer on the R. Uruguay told me that in a deserted garden he



had seen the planted artichokes degenerating into this plant. Of course this man had never heard of the theories of Botanists. I certainly never saw it South of R. Salado. The true thistle, (variegated green & white like the sort called sow-thistles,) & which chiefly abounds in the Pampas of Buenos Ayres, I noticed in the valley of the R. Sauce. There is a very large fresh water lake near the town; on the coast I found a perfect piece of the case of the Megatherium. Whilst the postmaster sent for horses several people questioned me concerning the army. I never saw anything like the enthusiasm for Rosas & for the success of this 'most just of all wars, because against barbarians'. It is, however, natural enough, for even here neither man, woman, horse or cow, was safe from the attacks of the Indians. The enthusiasm for Rosas was universal & when some events which subsequently will be mentioned, happened, I was not at all surprised.

To the 16th, 17th & 18th Posta. Country of one uniform appearance: rich green plain, abundance of cattle, horses & sheep; here & there the solitary Estancia, with its Ombu tree. In the evening torrents of rain, arrived after dark at the Posta; was told that if I travelled by the Post I might sleep there; if not I must pass on, for there were so many robbers about, he could trust nobody. Upon reading my passport, & finding that I was a Naturalista, his respect & civility were as strong as his suspicions had been before. What a Naturalista is, neither he or his countrymen had any idea; but I am not sure that my title loses any of its value from this cause.

*Diary pp. 182-3*

C.D. TO MISS CAROLINE DARWIN

September 20th. Buenos Ayres

Dear Caroline

I have just returned from a grand expedition, as a merchant vessel sails tomorrow for Liverpool. I will write as much as I can before I go to bed. The Beagle after leaving Maldonado sailed for the R. Negro. When [there] I determined to go by land to Bahia Blanca & wait for the vessel, & subsequently having heard that the country was tolerably safe, I proceeded on to this city. It is a long journey between 500 & 600 miles, through a district till very lately never penetrated except by the Indians & never by an Englishman. There is now a bloody war of extermination against the Indians. The Christian army is encamped on the R. Colorado, in this progress, a few months since from B. Ayres. General Rosas left at every 10 or 15 leagues, 5 soldiers & a troop of horses – so fine an opportunity for Geology was not to be neglected, so that I determined to start at all hazards. The horses &c were all gratis, my only expence (about 20£) was hiring a trusty companion. I am become quite a Gaucho, drink my Mattee, & smoke my cigar, & then lie down & sleep as comfortably with the Heavens for a canopy as in a feather bed. It is such a fine healthy life on horseback all day, eating nothing but meat, & sleeping in a bracing air, one awakes as fresh as a lark. From R. Negro to the Colorado, it is a dreary uninhabited camp with only two brackish springs. From the latter place to B Blanca there are the *Postas*. From Bahia Blanca to the Rio Salado the *Postas* are irregular, & excepting them there is not an



habitation. There is sometimes a hovel & sometimes not & the soldiers live entirely on deer & Ostriches. The wildness & novelty of this journey gave it great interest to me & the danger is not nearly as great as it appears, for the Indians are now all collecting in the Cordilleras for a great battle this summer. I stopped two days to examine the Sierra do Ventana, a curious mountain which rises in the vast plain – the ascent was excessively fatiguing, & there was but little to reward one for the trouble. The plain merely resembles a sea without its beautiful colour. At the Guardia del Monte, I found some more of the armour of the giant Megatherium, which was to me very interesting, as connecting the Geology of the different parts of the Pampas. I likewise at Bahia Blanca found some more bones more perfect than those I formerly found, indeed one is nearly an entire skeleton.

The Beagle is now at Monte Video or Maldonado. I received a letter from the Captain enclosing one from Catherine dated London May 29th. As I have not my letter-case here I cannot say whether I received the April one. I shall soon be on horseback again; there is a river to the North (the Carcarana) the banks of which are so thickly strewn with great bones, that they build part of the Corral with them. Every person has observed them, so they must be very numerous. I shall then return to M. Video & join the Beagle. At the latter end of next month she sails for the Straits of Magellan & likewise pays the Falkland Islands another visit.

I am now living in the house of a most hospitable English merchant. It appears quite strange writing in an English furnished room, & still more strange to see a lady making tea. I shall be obliged to draw rather largely for money. I do it with more confidence, as I know for certain after leaving the Plata there will be 5 or 6 months of Southern economy. I cannot at present say exactly what sum. Travelling is very cheap in this country, the only expence is procuring a trusty companion, but in that depends your safety, for a more throat-cutting gentry do not exist than these Gauchos on the face of the world. It is now the Spring of the year, & everything is budding & fresh: but how great a difference between this & the beautiful scenes of England. I often think of the Garden at home as a Paradise; on a fine summers evening, when the birds are singing how I should enjoy to appear like a Ghost amongst you, whilst working with the flowers. There are pleasures I have to view, through the long interval of the Pacific & Indian oceans. Good bye, God bless you all. My dear Caroline, when shall we have a ride together.

Yours most affectionately,  
Chas Darwin.

Give my very best love to my Father.

*Darwin and Beagle* pp.90-2

Darwin reached Buenos Aires on September 20th, and after a week there rode on northwards to the town of Santa Fe, two hundred miles up the River Parana. Having booked a passage back to Buenos Aires by boat, its departure was postponed by bad weather, and he took the opportunity to study the local geology. He found another horse's tooth, and in this passage from the *Narrative*, written



after his return to England, revised his earlier opinion (see p. 151) about its antiquity.

I was delayed here five days, and employed myself in examining the geology of the surrounding country, which was very interesting. We here see beds of sand, clay, and limestone, containing sea-shells and sharks' teeth, passing above into an indurated marl, and from that into the red clayey earth of the Pampas, with its calcareous concretions and the bones of terrestrial animals. This vertical section clearly tells us, of a large bay of pure salt-water, gradually encroached on, and at last becoming the bed of a muddy estuary, into which floating carcasses were swept. I found near the Bajada a large piece, nearly four feet across, of the giant armadillo-like case; also a molar tooth of a mastodon, and fragments of very many bones, the greater number of which were rotten, and as soft as clay.

A tooth which I discovered by one point projecting from the side of a bank, interested me much, for I at once perceived that it had belonged to a horse. Feeling much surprise at this, I carefully examined its geological position, and was compelled to come to the conclusion, that a horse, which cannot from a comparison of the tooth alone, be distinguished from the existing species, lived as a contemporary with the various great monsters that formerly inhabited South America. Mr Owen and myself, at the College of Surgeons, compared this tooth with a fragment of another, probably belonging to the *Toxodon*, which was embedded at the distance only of a few yards in the same earthy mass. No sensible difference in their state of decay could be perceived; they were both tender, and partially stained red. If the horse did not coexist with the *Toxodon*, the tooth must by some accident, not very easily understood, have been embedded within the last three centuries (the period of the introduction of the horse), with the remains of those animals, which ages since perished, when the Pampas was covered by the waters of the sea. Now, I may ask, will any one credit that two teeth of nearly equal size, buried in the same substance close together, after a period of so vast an inequality, could exist in the same condition of decay? We must conclude otherwise. Certainly it is a marvellous event in the history of animals, that a native kind should have disappeared to be succeeded in after ages by the countless herds introduced with the Spanish colonist! But our surprise should be modified when it is already known, that the remains of the *Mastodon angustidens* (the tooth formerly alluded to as embedded near that of the horse, probably belonged to this species) have been found both in South America, and in the southern parts of Europe.

With regard to North America, Cuvier says the *Elephas primigenius* 'has left thousands of its carcasses from Spain to the shores of Siberia, and it has been found in the whole of North America'. The fossil ox, in a like manner, he writes, is buried 'dans toute la partie boréale des deux continens, puisque on en a d'Allemagne, d'Italie, de Prussie, de la Sibérie occidentale et orientale, et de l'Amérique'. I may here add that horses' bones, mingled with those of the mastodon, have several times been transmitted for sale from North America to England; but it has always been imagined, from the simple fact of their being



horses' bones, that they had been accidentally mingled with the fossils. Among the remains brought home by Captain Beechey from the west coast of the same continent, in the frozen region of  $66^{\circ}$  north, Dr Buckland has described the astragalus metacarpus, and metatarsus of the horse, which were associated with the remains of the *Elephas primigenius*, and of the fossil ox. Thus we have an elephant, an ox, and a horse (the species of the latter is only presumed to be identical), common to Europe and to North America.

Very few species of living quadrupeds, which are altogether terrestrial in their habits, are common to the two continents, and these few are chiefly confined to the extreme frozen regions of the north. The separation, therefore, of the Asiatic and American zoological provinces appears formerly to have been less perfect than at present. The remains of the elephant and of the ox have been found on the banks of the Anadir (long.  $175^{\circ}$  E.), on the extreme part of Siberia, nearest the American coast: and the former remains, according to Chamisso, are common in the peninsula of Kamtschatka. On the opposite shores, likewise, of the narrow strait which divides these two great continents, we know, from the discoveries of Kotzebue and Beechey, that the remains of both animals occur abundantly: and as Dr Buckland has shown they are associated with the bones of the horse, the teeth of which animal in Europe, according to Cuvier, accompany by thousands the remains of the pachydermata of the later periods. With these facts, we may safely look at this quarter, as the line of communication (now interrupted by the steady progress of geological change) by which the elephant, the ox, and the horse, entered America, and peopled its wide extent.

The occurrence of the fossil horse and of *Mastodon angustidens* in South America, is a much more remarkable circumstance than that of the animals mentioned above in the northern half of the continent; for if we divide America, not by the Isthmus of Panama, but by the southern part of Mexico, in lat.  $20^{\circ}$ , where the great table-land presents an obstacle to the migration of species, by affecting the climate, and by forming, with the exception of some valleys and of a fringe of low land on the coast, a broad barrier; we shall then have two zoological provinces strongly contrasted with each other. Some few species alone have passed the barrier, and may be considered as wanderers, such as the puma, opossum, kinkajou, and peccari. The mammalogy of South America is characterized by possessing several species of the genera of llama, cavy (and the allied animals), tapir, peccari, opossum, anteater, sloth, and armadillo. If North America had possessed species of these genera proper to it, the distinction of the two provinces could not have been drawn; but the presence of a few wanderers scarcely affects the case. North America, on the other hand, is characterized by its numerous rodents, and by four genera of solid horned ruminants, of which section the southern half does not possess a single species.

This distinction of the two zoological provinces does not appear always to have existed. At the present day the order of Edentata is much more strongly developed in South America, than in any other part of the world: and concluding from the fossil remains, which were discovered at Bahia Blanca, such must have been the case during a former epoch. In America, north of Mexico, not one of this



order is now found: yet, as is well known, the gigantic megalonyx, considered by Cuvier as a species of Megatherium, has been found only in that country; and as it appears from recent observations, the Megatherium Cuvierii itself likewise occurs there. Mr Owen showed me the tibia of some large animal, which Sir Philip Egerton had purchased out of a collection of the remains of the mastodon brought from North America. Mr Owen says it certainly belongs to one of the Edentata, and it so closely resembles a bone which I found embedded, together with fragments of the great armadillo-like covering, in Banda Oriental, that it probably forms a species of the same genus. Lastly, among the fossils brought home by Captain Beechey from the N.W. coast, there was a cervical vertebra, which, when compared by Mr Pentland with the skeletons at Paris, was found to resemble that of the sloth and anteater more than that of any other animal, although having some points of essential difference.

Of the Pachydermata four or five species are now found in America; but, as in the case of the Edentata, none are peculiar to the continent north of Mexico; and one alone seems to exist there as a wanderer. Yet the account of the multitude of bones of the mastodon and elephant, which have been discovered in the salt-licks of North America, is familiar to every one. The remains of the *Mastodon giganteum* have been found nowhere else; but those of the *Elephas primigenius* are common to a large part of the terrestrial globe. This elephant must have existed in Mexico; and Cuvier, judging from a fragment of a tusk, thinks it even extended to the neighbourhood of Quito in South America. In the latter country three species of Mastodon have been discovered. One of these, *M. angustidens*, is common to Europe. It is singular that its remains, as yet, have never been brought from North America; nevertheless, considering that it was a contemporary of the extinct animals above mentioned, it seems highly probable that it arrived by the same line of communication on the N.W. coast. As its remains have frequently been found at a great elevation in the Cordillera, perhaps its habits led it to follow that chain of mountains from north to south.

After these facts, it is only in conformity with what we might almost have expected, that the horse, belonging to the same order of Pachydermata, should formerly have inhabited both North and South America. It is interesting thus to discover an epoch anterior to the division, as far at least as two important orders among the mammalia are concerned, of the continent into two separate zoological provinces. The geologist who believes in considerable oscillations of level in the crust of the globe within recent periods, will not fear to speculate either on the elevation of the Mexican platform, as a cause of the distinction, or on the submergence of land in the West Indian seas, — a circumstance which is perhaps indicated by the zoology of those islands.



R.F. TO C.D.

Beagle, Monte Video, 4th October 1833

My dear Darwin,

Two hours since, I received your epistle dated 26th, and most punctually and immediately am I about to answer your queries (mirabile !!).

But firstly of the the first – my good Philos why have you told me nothing of your hairbreadth scapes & moving accidents? How many times did you flee from the Indians? How many precipices did you fall over? How many bogs did you fall into? How often were you carried away by the floods? and how many times were you kilt? That you were not kilt *dead* I have visible evidence in your handwriting, as well as in a columnar paragraph in Mr Love's unamiable paper.

You did not tell me whether you received the blank papers safely. You informal homo, how am I to feel certain that I have not signed what may blast my *immaculate* reputation? Harris carried the Packet which contained them, and promised to deliver them faithfully. How Sancho by Mr Hood's assistance contrived so to mismanage as to reach B. Ayres some days after Harris, Quien sabe? In it were 5 'Skimpy' lines, as Capt Beaufort would call them, & a promise of better behaviour.

Since the date of that note, the Beagle has been two days at Maldonado, one day here, and about a week between this & Cape Corrientes. Not having any Stone pounders on board – nor any qualified person (the *Mate* being absent) – I could not think of landing, so *you* have yet a *chance*, 'de verus' (it blew strong & prevented landing).

I believe you have heard from Mr Parry and are aware of his loss. If you have not heard from him, your *ally* (!! of bone stealing fame) will have informed you. Shocking as it was to him and his family, but to him most particularly, I am in hopes that better times will be found by our good friend Parry in consequence of his being a single man. Warmhearted and friendly as she was – and friendly to the utmost extent of her means – she had her share of woman's weakness and woman's failing. Robert Parry is gone to England in the 'Mary Worrall' Merchantman, to be placed at a school. The young daughters are going to B. Ayres, also to school. Mr P. intends to give up his house and turn 'bachelor, in lodgings' – a *wise* resolve, though painful indeed to the Father of a family. Think what a change in a domestic circle.

If Mr P. has written as he intended, you have heard of Mr Martens – Earle's Successor – a *stone pounding artist* who exclaims *in his sleep* 'think of *me* standing upon a pinnacle of the Andes, or sketching a Fuegian Glacier !!!'. By my faith in Bumpology, I am sure you will like him, and like him *much*; he is – or I am wofully mistaken – a 'rara avis in navibus, Carloque simillima Darwin'. Don't be jealous now, for I only put in the last bit to make the line scan; you know very well your degree is 'rarissima', and that your line runs thus: Est avis in navibus Carlos rarissima Darwin. But you will think I am cracked, so *seriatim* he is a gentlemanlike well informed man. His landscapes are *really* good (compared with London men), though perhaps in *figures* he cannot equal Earle. He is very industrious, and gentlemanlike in his *habits* – (not a small recommendation).



Wickham gets on famously; really the 'Lighter' will not merit trifling considerations. Mr Kent of the Pylades is at Gorriti, belonging to our Squad. We have plenty of men, and *good* ones, and all is prospering. — 'Well, but the conjunctions — the conjunctions', I hear you saying, 'you have got to the end of a sheet of paper without telling me one thing that I wanted to know.' This is the 4th of October — 'so the date of your letter tells me'. — well — hum — if — hum — but — we must consider — then — hum — tomorrow will be the sixth — 'Prodigious!!'. Do you know what I mean — 'to be sure'. So — and so & so — & hum hum hum & off goes the head !!

I never will write another letter after tea — that green beverage makes one tipsy; besides it is such a luxury feeling that your epistle is not to go across the wide atlantick, and has only to cross the muddy Plata. It is so awful writing to a person thousands of miles off, when your conscience reproaches you with having been extremely negligent and tells you that six or eight or (oh — how awful) twelve months 'History' is due to your expectant and irate correspondent. Still *you* get no answer — 'What is the Beagle going to do — will you tell me, or not?'

Philos, be not irate; have patience, and I will tell thee all. Tomorrow we shall sail for Maldonado, there we shall remain until the middle of this month; thence we shall return to Monte Video, to remain quietly, *if possible*, until the end of the month. I will try all I can to get away from the River Plate the first week in November; but there is much to do, and I shall not be surprised if we are detained even until the middle of November. However, weather is of such consequence that every long day gained will tell heavily, and I hope & will try hard to be off *early* in November. Therefore do not delay your arrival *here* later than the *first few* days of November at the *farthest*.

You say nothing about the 'Journal of the Expedition up the Rio Negro', nor have you sent me the map of the province of Buenos Ayres. I pray you to *do the latter* — right speedily — and enquire about the *former*, from Mr Gore as well as the other man whose name I forget (Señor — Don — or Colonel Something, or Somebody); but in writing to Mr Gore I mentioned it, so he will know it. I wish to compare the map with our charts, previous to sending them away, in order to 'connive' a little, as your *friend* Mr Bathurst says.

Roberts (of the Liebre) passed our bows *this morning* on board of the 'Paz', bound to Rio Negro with a cargo of *tobacco*. He did not honor us with a visit, nor did he ask for Chico; respecting the former he was somewhat rude, and as to the latter, rather wise I think.

Adios Philos. Ever very faithfully yours,  
Robt FitzRoy

P.S. 2d (Irish fash.) Have you yet heard from Henslow — or about your collections sent to England?

P.S. I do not rejoice at your extraordinary & outrageous peregrinations because I am envious, jealous, and extremely full of all uncharitableness. What will they think at home of 'Master Charles'? 'I do think he be gone mad.' Prithee be *careful*; while there's *care* there's no *fear*, says the saw.



C.D. TO MISS CAROLINE DARWIN

Buenos Ayres, October 23d

My dear Caroline

A vessel will sail in an hours time to Liverpool, & I will write as much as I can. I have just returned from an adventurous tour. I think I mentioned my intention of starting to the Northern parts of this Province. I by chance procured Capt. Head's peon & arrived after a rapid gallop at St Fe, about 300 miles to the North – it was an interesting ride & good opportunity of seeing the real sea-like Pampas. At St Fe I was most unfortunately rather unwell, so as to be unable to ride. I crossed over to the Bajada, the Capital of Entre Rios, & then staid some days, but finding so much time lost I was obliged to embark on board a vessel down the Parana. This immense river, with its islands full of Tigers & Capinchos, is so very great as to appear only like an oblong lake.

When we arrived near Buenos Ayres, I left the vessel with the intention of riding into town. The minute I landed I was almost a prisoner, for the city is closely blockaded by a furious cut-throat set of rebels. By riding about (at a ruinous expence) amongst the different generals, I at last obtained leave to go on foot without passport into the city: I was thus obliged to leave my Peon & luggage behind; but I may thank kind providence I am here with an entire throat. Such a set of misfortunes I have had this month, never before happened to poor mortal. My servant (Covington by name & most invaluable I find him) was sent to the Estancia of the merchants whose house I am staying in – he the other day nearly lost his life in a quicksand & my gun completely. We now hear the house is ransacked (& probably his clothes all stolen!). Communication with the country is absolutely cut off, he cannot come into town, & the Beagle before long sails to the South. Here is a pretty series of misfortunes, & there are plenty of smaller ones to fill up the gaps. I drew a bill a month ago for 80£. I am very sorry to say I shall be obliged from these great unexpected misfortunes to draw another one. After my Father's first great growl is over, he must recollect we shall be now 8 months to the South, where as last time, I need neither spend or draw money, the only security I can give which will be trusted.

Independent of all these uncommon mortifications & my illness at St Fe preventing my return by the Rio Uruguay, through a most interesting Geological country, the tour answered well. It is quite magnificent when I consider I have ridden nearly 800 miles in a North & South direction, & the greater part through country most imperfectly known. We are in a pretty state in this nice city – they think nothing of cutting the throats of 30 prisoners, whom they happened to take the other day: and they are right; for what is it, to quietly stabbing all the Indian women above 20 years old, or younger if ugly. Oh these Creoles are such a detestably mean unprincipled set of men as I hope this world does not contain the like. There literally is only one Gentleman in Buenos Ayres, the English Minister. He has written to order the Beagle up. But we sail under such particular instructions I know not whether the Captain will come. If he does all will be right about Covington – otherwise I shall be obliged to send some small vessel or boat to smuggle him off the coast. In fact I am in a pretty pickle. I wish the confounded



revolution gentlemen would, like Kilkenny Cats, fight till nothing but the tails are left. Some of the good people expect the town to be plundered – which will be a very amusing episode to me.

dear Caroline, from  
Chas Darwin

I will write again

I sent home through Capt. Beaufort about 2 or 3 months ago some more of my journal. Be sure acknowledge it, & in more than one letter.

*Darwin and Beagle* pp.92-4

R.F. TO CAPTAIN BEAUFORT

H.M.S. Beagle, Monte Video. 26th Octr 1833  
Private

Dear Captain Beaufort,

My official letter to you is but a few lines, and this will hardly be longer. In truth I have much work in hand and ought not to talk. I know you are anxious to hear of our finally quitting the River Plata, and would rather that I should hasten that period as much as possible. We are getting on fast, but have a large *heap* to work at which *cannot* be finished until the middle of November. By the Cockatrice – November Packet – our Cargo shall be sent, and directly afterwards Goodbye Argentine Water & troublesome ignorant Republicans.

We have had a satisfactory two months' work between the Rivers Negro & Plata since I last wrote to you. Both Vessels are in excellent trim and ready for *anything*. On the 25th of September the Hopeful Schooner was boarded in Long. 49° W. Lat. 32° S. by the 'Sarah Maria' – Jebb, Master (an English Brig or Barque). Mr Rea on board, all well, bound to the Southward.

I am disappointed at not hearing what their Lordships think of the new 'Adventure'. Your letter dated Aug. 7th has reached me, but nothing since, and up to that date you had not heard of the *addition*.

Thanks for the Almanack. I was in dire alarm, thinking they would not arrive in time. I have been rather surprised by what the Nautical Magazine says of the Rio Longitude. What is said to be the mean of several observations is, *to a second*, what I sent to you; and in one of your kind letters you said that the Beagle's results would have the '*proud office of deciding between a body of authorities*'.

My new Sextant (with an extra glass) answers extremely well, and is a general favourite. I can take *back* observation sights for *time* when the Sun is only 22° high, and agree exactly with sights taken at the *opposite* horizon by other observers.

Your's most truly and respectfully,  
Robt FitzRoy

P.S. The last Season has been more severe, as to wind, than any known by the inhabitants of the Falklands, or by any of the Sealers on the Coast. A lee quarter boat was swamped, stove very much, & cut away; but up to the present time no other damage has been sustained. While we have good rope and good sails, we are



independent of weather, but the wants of this vessel must not be judged by those of others of her class who pass their time in comparative tranquillity. I assure you that this last cruize has rendered me an implicit believer in all that is said in Lord Anson's Voyage, and previously I considered that account exaggerated. Had not this vessel been the best of Sea boats, and our Spars, rope, and sail, of the best possible kind, I might have a tale of disaster to relate. None of my Shipmates saw so much furious wind during the previous five years in the Beagle. Five vessels have been wrecked on 'Terra Del' and at the Falklands. I have lost my Clerk, in a sad manner. In Berkeley Sound, not half a mile from the Beagle, he shot a curious bird, and anxious to get it out of the water, he stripped and swam for it; the seaweed caught and entangled his legs, and the tide rose over his head. A melancholy end for one of the worthiest young men I ever knew. Earle is very ill & has been an Invalid during the last cruize. Darwin hearty & well, at work near Maldonado. All others well and well deserving.

Most sincerely your's,  
Robt FitzRoy

[from the archives of the Hydrographic Department, Taunton]

Darwin describes his seven hundred miles ride to Henslow.

C.D. TO PROFESSOR HENSLOW

Monte Video, November 12th 1833

My dear Henslow.

By the same packet which takes this I send a cargo of specimens. There are two boxes & a cask. One of the former is lined with tin-plate & contains nearly 200 skins of birds & animals – amongst others a fine collection of the mice of S. America – the other box contains spirit bottles, & will only require just looking at to see how the Spirit stands. But the Bird-skins, if you will take the trouble, will be much better for a little airing. The Cask is divided into Compartments, the upper contains a few skins – the other a jar of fish, & *I am very anxious to hear how the spirit withstands evaporation*, an insect case, which would require airing, a small box of stones, which may be left in statu quo, a bundle of seeds, which I send as a most humble apology for my idleness in Botony. They were collected in Port Alegria & in this country: the temperature of the former must be that of a warm greenhouse, & even plants of this country would require some protection (the olive & orange bear fruit here). Also a bag of the sweepings of a Granary; it will be a Botanical problem to find out to what country the weeds belong. It might be curious to observe whether Europæan weeds have undergone any change by their residence in this country. If they are like the men, I will answer for it they are not much improved. I also send to the care of Dr Armstrong in Plymouth, an immense box of Bones & Geological specimens. I do this to avoid the long land-carriage: & as they do not want any care it does not much signify where kept – another reason is, not feeling quite sure of the value of such bones as I before sent you. I have one mutilated skeleton of the animal of which I sent the jaw with 4 small teeth.





Since my last letter to you (middle of July, when I sent off some specimens) I have been, as they say here, un grande golopecador. I left the Beagle at the R. Negro & crossed by land to B. Ayres. There is now carrying on a bloody war of extermination against the Indians, by which I was able to make this passage. But at the best it is sufficiently dangerous, & till now very rarely travelled – it is the most wild, dreary plain imaginable; without settled inhabitant or head of cattle. There are military Postas, at wide intervals, by which means I travelled. We lived for many days on deer & ostriches & had to sleep in the open camp. I am quite charmed with the Gaucho life: my luggage consisted of a Hammer, Pistol & shirt & the Recado (*saddle*) makes the bed: Where-ever the horses tire, there is your house & home. I had the satisfaction of ascending the Sierra de la Ventana, a chain of mountains between 3 & 4,000 feet high, the very existence of which is scarcely known beyond the Rio Plata. After resting a week at Buenos Ayres, I started for the St Fe; on the road the Geology was interesting. I found two great groups of immense bones; but so very soft as to render it impossible to remove. I think from a fragment of one of the teeth they belonged to the Mastodon. In the R. Carcarana I got a tooth which puzzles even my conjectures, it looks like an enormous gnawing one. At St Fe, not being well, I embarked & had a fine sail of 300 miles down that princely river the Parana. When I returned to B. Ayres I found the country upside down with revolutions, which caused me much trouble. I [at] last got away & joined the Beagle. I am now going to have one more gallop to the Uruguay, & then we are off to Tierra del Fuego. We shall for the future be much amongst Volcanic rocks, & I shall want more mineralogical knowledge. Can you send me out any books, which with instructions from yourself, will enable me to use my reflecting Goniometers. If you know of any, it would [be] doing me a great favour to send it to Capt. Beaufort, who will forward it. As I am very anxious to hear from you, perhaps this will be the best manner of sending me a letter. I want much to hear about your family – L. Jenyns, your lectures, excursions & parties etc., respecting all of which I have so very many pleasant recollections, that I cannot bear to know nothing. We shall pass the Sts of Magellan in the Autumn & I hope to stay some time in the southern parts of Chili. There are two Volcanoes within 60 miles of Concepcion. I will run the risk of being eat up alive to see two real good burning Volcanoes. Oh the blue skys & the Bananas of the Tropics. Life is not worth having in these miserable climates, after one peep within those magic lines. Believe me my dear Henslow

Ever yours most truly obliged

Chas. Darwin.

Would it not be a good plan to send sea-weeds in Spirits having previously noted the colour by Werner??

*Darwin & Henslow* pp.80–2

The *Beagle's* sailing for Tierra del Fuego being postponed while the charts of the Patagonian coast were completed, Darwin had time for one more long ride through the Banda Oriental to the River Uruguay.



NOV. 26th. I set out on my return in a direct line for Monte Video. Having heard of some giant's bones at a neighbouring farm-house on the Sarandis, a small stream entering the Rio Negro, I rode there accompanied by my host, and purchased for the value of eighteen pence, the head of an animal equalling in size that of the hippopotamus. Mr Owen in a paper read before the Geological Society, has called this very extraordinary animal, *Toxodon*, from the curvature of its teeth. The following notice is taken from the proceedings of that society: Mr Owen says, judging from the portion of the skeleton preserved, the *Toxodon*, as far as dental characters have weight, must be referred to the rodent order. But from that order it deviates in the relative position of its supernumerary incisors, in the number and direction of the curvature of its molars, and in some other respects. It again deviates, in several parts of its structure which Mr Owen enumerated, both from the *Rodentia*, and the existing *Pachydermata*, and it manifests an affinity to the *Dinotherium* and the *Cetaceous* order. Mr Owen, however, observed, that 'the development of the nasal cavity and the presence of frontal sinuses, renders it extremely improbable that the habits of the *Toxodon* were so exclusively aquatic as would result from the total absence of hinder extremities; and concludes, therefore, that it was a quadruped, and not a Cetacean; and that it manifested an additional step in the gradation of mammiferous forms leading from the *Rodentia*, through the *Pachydermata* to the *Cetacea*; a gradation of which the water-hog of South America (*Hydrochaerus capybara*) already indicates the commencement amongst existing *Rodentia*, of which order it is interesting to observe this species is the largest, while at the same time it is peculiar to the continent in which the remains of the gigantic *Toxodon* were discovered.'

The people of the farm-house told me that the remains were exposed, by a flood having washed down part of a bank of earth. When found, the head was quite perfect; but the boys knocked the teeth out with stones, and then set up the head as a mark to throw at. By a most fortunate chance, I found a perfect tooth, which exactly fits one of the sockets in this skull, embedded by itself on the banks of the Rio Tercero, at the distance of about 180 miles from this place. Near the *Toxodon* I found the fragments of the head of an animal, rather larger than the horse, which has some points of resemblance with the *Toxodon*, and others perhaps with the *Edentata*. The head of this animal, as well as that of the *Toxodon*, and especially the former, appear so fresh, that it is difficult to believe they have lain buried for ages under ground. The bone contains so much animal matter, that when heated in the flame of a spirit-lamp, it not only exhales a very strong animal odour, but likewise burns with a slight flame.

*Narrative* 3 pp. 180-1

NOV. 29th-DEC. 4th. During these few days I resided on shore; the cause of the ship's delay being the charts not being completed.

During the last six months I have had some opportunity of seeing a little of the character of the inhabitants of these provinces. The gauchos or country men are



very superior to those who reside in the towns. The gaucho is invariably most obliging, polite & hospitable. I have not met one instance of rudeness or inhospitality. He is modest both respecting himself & country, at the same time being a spirited bold fellow. On the other hand there is much blood shed, & many robberies committed. The constant presence of the knife is the chief cause of the former. It is lamentable to hear how many lives are lost in trifling quarrels; in fighting each party tries to mark the face of his adversary by slashing his nose or eye; deep & horrid looking scars often attest that one has been successful. Robberies are a natural consequence of universal gambling, much drinking & extreme indolence. At Mercedes I asked two men why they did not work; one said that the days were too long; the other that he was too poor. The number of horses & profusion of food is the destruction of all industry. Moreover there are so many feast days; then again nothing can succeed without it is begun when the moon is on the increase; & from these two causes half the month must be lost. Police & justice are quite inefficient. If a man commits a murder & should be taken, perhaps he may be imprisoned or even shot; but if he is rich & has friends he may rely on it, nothing will happen. It is curious that the most respectable people in the country will invariably assist a murderer to escape. They seem to think that the individual sins against the government & not against the state. A traveller has no other protection than his own arms; & the constant habit of carrying them, chiefly prevents a more common occurrence of robberies. The character of the higher & more educated classes who reside in the towns, is stained by many other crimes, partaking in a lesser degree in the good parts of the Gaucho character. He is a profligate sensualist, who laughs at all religion; he is open to the grossest corruption; his want of principle is entire. An opportunity occurring, not to cheat his friend would be an act of weakness; to tell the truth where a lie might be more serviceable, would be simplicity of a child. The term honour is not understood; neither it, nor any generous feeling, the remains of chivalry, have survived the long passage of the Atlantic. If I had read these opinions a year ago, I should have accused myself of much illiberality: now I do not. Every one, who has good opportunities of judging, thinks the same. In the Sala of Buenos Ayres I do not believe there are six men to whose honesty or principles you could trust. EVERY *public officer* is to be bribed; the head of the post office sells forged government francs: the Governor and prime minister openly plunder the state. Justice, where gold is in the case, is hardly expected. I know a man (he had good cause) who went to the chief Justice & said 'here are 200 dollars (sixpences) if you will arrest such a person *illegally*; my lawyer recommended me to take this step'. The Chief Justice smiled acquiescence & thanked him; before night the man was in prison. With this utter want of principle in the leading men; with the country full of ill-paid, turbulent officers; they yet hope that a Democratic form of government will last. In my opinion before many years, they will be trembling under the iron hand of some Dictator. I wish the country well enough to hope the period is not far distant.

On first seeing the common society of the people, two or three things strike one as remarkable: the excellent taste of all the women in dress: the general good manners in all grades of life; but chiefly the remarkable equality of all ranks. At



the Colorado men who kept the lowest little shops used to dine with General Rosas. A son of a Major at B. Blanca gains a livelihood by making paper cigars; he wished to come as Vaqueano with me to B. Ayres; but his father was afraid. Many in the army can neither read or write; yet all meet on perfect terms of equality. In Entre Rios the Sala contains 6 members. One of these was a sort of shopman in a store & evidently by no means degraded by such an employment. This is all what might be expected in a new country; nevertheless the absence of Gentlemen par excellence strikes one as a novelty.

My time at M. Video was spent in getting ready for our long cruize in Tierra del Fuego. It was a pleasant employment preparing to leave for ever the uninteresting plains of the R. de La Plata.

The Beagle & Adventure are both ready for sea; with a fine stock of provisions & excellent crews. The other day, there was an instance of the unaccountable manner in which seamen sometimes run away from a ship. Two men, petty officers, in good favour & with two or three years pay owing them, ran away, & the design must have been made sometime previously. These men were allowed repeatedly to go on shore & held the first stations on board. There is a degree of infatuation & childish want of steadiness in seamen, which to a landsman is quite incomprehensible & hardly to be credited.

I called one day on Mr Hood, the Consul General, in order to see his house which had been a short time previously struck by lightning. The effects were curious: the bell wires were melted & the red hot globules dropping on the furniture drilled small holes in a line beneath them; when falling on glass vessels, they melted & adhered to them. Yet the room was at least 15 feet high & the wire close to the ceiling. In one of the walls the electric fluid exploded like gunpowder, & shot fragments of bricks with such force as to dent the wall on the opposite side. Where the bell wire ran, the paper was blackened by the oxide of the metal for nearly a foot on each side; in a like manner the frame of a looking glass was blackened; the gilding must have been volatilized, for a smelling bottle which stood near, was firmly coated with some of it. The windows were all broken & everything hanging up fell down by the Jar. It happened very early in the morning. When I was at B. Ayres a short time previous to this, the church was much shattered, & a vessel lost her main-mast.

*Diary* pp. 197-200

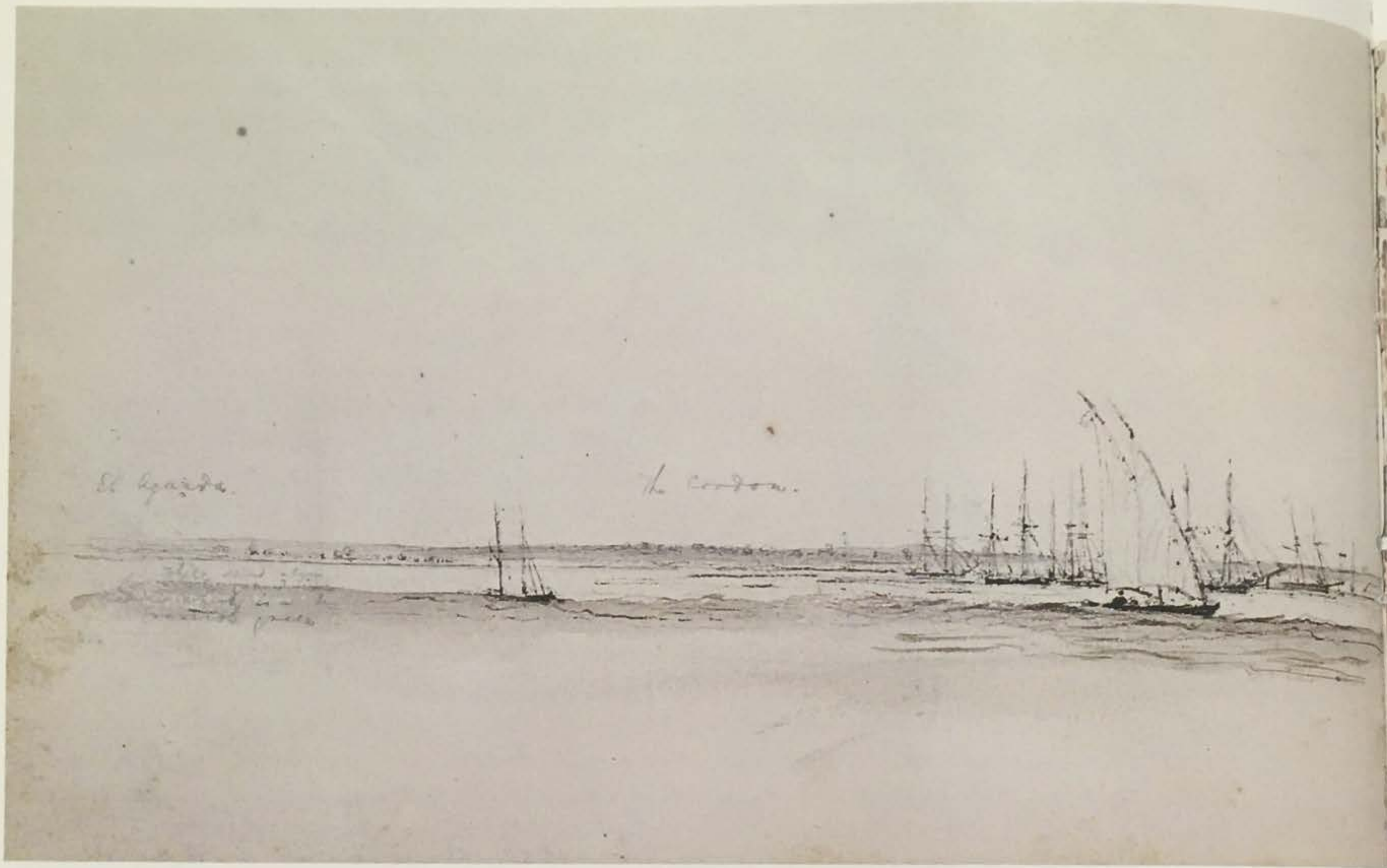
C.D. TO MISS CAROLINE DARWIN

November 13th 1833. Monte Video

My dear Caroline

I have to thank you for a letter dated September 1st & one from Susan July 22d. Since I wrote from B. Ayres, I have suffered a host of vexations, but at last every thing has ended prosperously. I with much trouble & by bribing got my servant in to the town & then started for this place, almost expecting the Beagle to have sailed. I now find to my astonishment she will remain 3 weeks more in the river. And here comes the whole purport of my letter, to announce more extravagance. I have really now been struggling for a whole week, but there is a very interesting





*Harbour of Montevideo*

geological formation on the coast of Uruguay, & every day I hear of more facts respecting it. When I think I never shall be in this country again, I cannot bear to miss seeing one of the most curious pieces of Geology. I wish any of you could enter into my feelings of excessive pleasure, which Geology gives, as soon as one *partly understands* the nature of a country. I have drawn a bill for 50£. I well know, that considering my outfit, I have spent this year far more than I ought to do. I should be very glad if my Father would make a real account against me as he often says jokingly. I hope he will not think I say this impertinently. The sort of interest I take in this voyage, is so different a feeling to anything I ever knew before, that, as in this present instance, I have made arrangements for starting, all the time knowing I have no business to do it. I wish the same feeling did not act so strongly with the Captain. He is eating an enormous hole into his capital for [the] sake of advancing all the objects of the voyage. The Schooner, which will so very mainly be conducive to our safety, he entirely pays for.

I have just packed up a Cargo of specimens. I send home nearly 200 skins of birds & the smaller quadrupeds & a fine set of fossil bones. There is one skeleton, sufficiently mutilated, of an animal, of which I do not think there exists at present





in the globe any relation. I am now living on shore in the house of an English merchant; as they are so busy, chart-making on board, that they would have nothing to say to me till this Packet sails. The whole coast of Patagonia is now completed, & please Providence, we trust by late in the Autumn to say the same of Tierra del Fuego. Poor Earl has never been well since leaving England & now his health is so entirely broken up that he leaves us – & Mr Marten, a pupil of C. Fielding & excellent landscape drawer, has joined us. He is a pleasant person, & like all birds of that class, full up to the mouth with enthusiasm.

We are all beginning to long for 'blue water' & I am sure I do, if it is merely to prevent my spending money. My present scheme is not a very great one. I go to Colonia del Sacramento, then up the coast of the Uruguay to the R. Negro, to the town of Mercedes, from thence back in direct line to M: Video or perhaps to the lime-kilns at Paysandu, 25 leagues up the Uruguay – the whole round will be under 400 miles, and the whole country uninhabited. There is peace at last in Buenos Ayres, so that I have lost very little of my property. Do you ever hear in England of their revolutions, which are considered as so important in this poor country? It is late. I am not in a writing humour, so I will wish you good night.



Give my love [to] all & my thanks for all the long & very nice letters. I will write again before we sail.

Yours very affectionately  
Chas Darwin.

Love to Nancy

*Darwin and Beagle* pp.94-6

R.F. TO CAPTAIN BEAUFORT

H.M.S. Beagle, Monte Video. 16 Novr 1833

My dear Captain Beaufort,

I have just received your letter dated Sept. 4/33. In a few days it shall be answered. The immediate departure of the Packet has upset all my plans, prevented my sending the charts &c by her, and added not a little to the unpleasant feelings which private as well as official letters have lately excited in my mind, which used to be contented.

A few days more slavery will complete the documents which are to be sent to England before the Beagle leaves the River Plata. I will leave them in the care of the British Consul, to be forwarded by the first Packet or Man of War after our departure.

When I reply to your letter of the 4th Sept, I will enter rather more upon a subject which is made more galling by reflexion. A Vessel (considered too small for a Commander, therefore generally given to a Lieutenant) has more arduous duties to perform than any other Surveying Vessel (larger though they be) on foreign Stations. She obtains neither the help of Dockyards, nor of Men of War. She is obliged to be crowded with provisions and stores in a manner previously unknown in a vessel of her class. Her employment is in the Stormy Southern latitude. She has a long voyage in prospect. Perhaps other Surveying Vessels have Dockyards within reach – perhaps they have Tenders, or a Tender – perhaps their voyages are not long.

I am *sorry* that, because *I* have offended, the *Service* should suffer.

Captain King – with far less extensive orders – had *three* vessels upon this Station – The Adventure, the Beagle, and the Adelaide Tender, which was purchased at *this* place by the Government for *two thousand pounds sterling* before any expence was incurred in an *entirely new outfit*.

A good spring should bend and be elastic. I hope it will not break.

Your's most faithfully,  
Robt FitzRoy

P.S. I never interfered at the Falklands – it was all a mistake!!

[from the archives of the Hydrographic Department, Taunton]



R.F. TO CAPTAIN BEAUFORT

H.M.S. Beagle, Monte Video. 5th Decr 1833  
Private

Dear Captain Beaufort,

At last we are actually quitting Monte Video. Tomorrow we shall be in the Atlantic.

I have quite recovered my temper, and will not again write so testy a letter as my last.

Two things I am *very* anxious about. The application I have made to you for Stokes's promotion, and that Mr Johnson should not lose time by having to pass another examination. Stokes is my constant, and my oldest, ally in the Beagle. His *work* appears to *me* to support my earnest request.

Pray, when you can catch five following minutes, tell me exactly what *you* think of the documents now sent to you. I have tried much to put in practice your ideas, but as we are all beginners, what appears right to me, may not suit good judges.

I return Falkner's Patagonia belonging to the Admiralty Library – I have obtained a copy from England.

Will you notice the remarks on the tides in the river Plata, when (Oh – when!!) you are at *leisure*. Your own are not exactly in accord, but I will not *strike* without a struggle. Is not this presumption? *No*, I have Captain Heywood and all the Pilots on my side.

I have sent to my Agent to pay for the Portsmouth papers and Nautical Magazines up to this date. My poor purse! I see that this voyage will fix me out of England, probably with Captain King. For myself I care little, and I am speaking *seriously*, but I do very much care for the excellent companions of my wanderings. All are well – all do well – excepting Mr Earle who is gone from us, invalided.

Ever most truly and respectfully yours,  
Robt FitzRoy

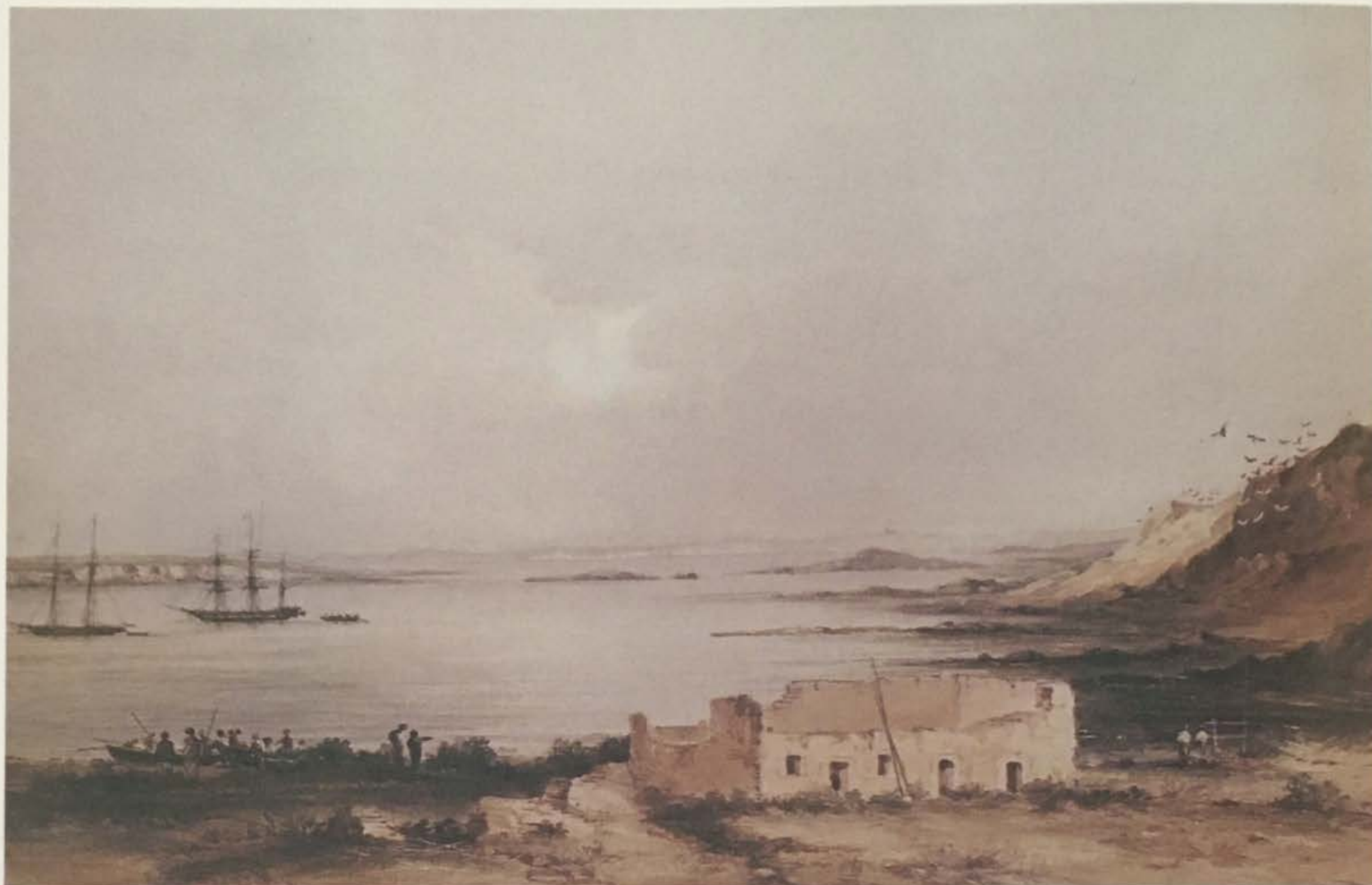
[from the archives of the Hydrographic Department, Taunton]

The *Beagle* and *Adventure* sailed south on December 7th. Christmas Day found them at Port Desire, on the coast of Patagonia.

DEC. 6th. The Beagle got under weigh at 4 o'clock in the morning & ran up the river to take in fresh water. We are now becalmed within sight of the Mount. The *Adventure* is at anchor close to us. May kind fortune for once favour us with fine weather & prosperous breezes.

7th. With a fair wind stood out of the river & by the evening were in clear water; never I trust again to enter the muddy water of the Plata. The *Adventure* kept ahead of us, which rejoiced us all, as there were strong fears about her sailing. It is a great amusement having a companion to gaze at. The following changes have taken place amongst the officers. Mr Wickham commands the *Adventure*; he has with him Messrs Johnstone & Forsyth & Mr Usborne as under-surveyor. Mr Kent from the *Pylades* has joined us as surgeon. Mr Martens is on board the *Beagle* filling the place which Mr Earle is obliged to vacate from ill health.





*Port Desire*

8th–23rd. Arrived at Port Desire. Our passage has been a very long one of seventeen days; the winds generally being light & foul, with the exception of a fresh gale or two.

The Adventure delayed us: she is found not to sail well on a wind; & at this place her sails will be altered. The harbor of Port Desire is a creek, which runs up the country in the form of a river: the entrance is very narrow; but with a fine breeze the Beagle entered in good style.

24th. Took a long walk on the North side: after ascending some rocks there is a great *level* plain, which extends in every direction but is divided by vallies. I thought I had seen some desert looking country near B. Blanca; but the land in this neighbourhead so far exceeds it in sterility, that this alone deserves the name of a desert. The plain is composed of gravel with very little vegetation & not a drop of water. In the vallies there is some little but it is very brackish. It is remarkable that on the surface of this plain there are shells of the same sort which now exist, & the muscles even with their usual blue colour. It is therefore certain, that within no great number of centuries all this country has been beneath the sea. Wretched looking as the country is, it supports very many Guanacoës. By great good luck I shot one; it weighed without its entrails 170 pounds: so that we shall have fresh meat for all hands on Christmas day.

Christmas 25th. After dining in the Gun-room, the officers & almost every man





*Christmas Day, 1833*

in the ship went on shore. The Captain distributed prizes to the best runners, leapers, wrestlers. These Olympic games were very amusing; it was quite delightful to see with what school-boy eagerness the seamen enjoyed them: old men with long beards & young men without any were playing like so many children. Certainly a much better way of passing Christmas day than the usual one, of every seaman getting as drunk as he possibly can.

26th. The Beagle is anchored opposite to a fort erected by the old Spaniards. It was formerly attempted to make a settlement here; but it quite failed from the want of water in the summer, & the Indians in the winter. The buildings were begun in very good style, & remain a proof of the strong hand of old Spain. Some of the enclosures & some cherry trees may yet be seen. The fate of all the Spanish establishments on the coast of Patagonia, with the exception of the R. Negro, has been miserable. Port Famine, as it is well known, expresses the sufferings of the settlers. At St Josephs every man excepting two, was massacred by the Indians on a Sunday when in church. The two were prisoners some years with the Indians; one of them now in extreme old age, I conversed with at R. Negro. I walked this day to some fine cliffs, five miles to the South: here the usual geological story, of the same great oyster-bed being upheaved in modern days, was very evident. In the evening weather very cold, & a Tierra del Fuego gale of wind.

28th. The Yawl under the command of Mr Chaffers, with three days' provisions, was sent to survey the head of the creek. In the morning we searched for



some watering places mentioned in an old chart of the Spaniards. We found one creek; at the head of which there was a small rill of brackish water. Here the tide compelled us to stay some hours. I, in the interval, walked several miles into the interior. The plain as is universally the case, is formed of sandy chalk & gravel; from the softness of these materials it is worn & cut up by very many vallies. There is not a tree, & excepting the Guanaco, who stands on some hill top a watchful sentinel over his herd, scarcely an animal or a bird. All is stillness & desolation. One reflects how many centuries it has thus been & how many more it will thus remain. Yet in this scene without one bright object, there is a high pleasure which I can neither explain or comprehend. In the evening we sailed a few miles further & then pitched the tents for the night.

29th. By the middle of the day the Yawl could not get any higher, from the shoalness of the water & the number of mud-banks. One of the party happening to taste the water found it only brackish. Mr Chaffers directly after dinner, started in the dingy, & after proceeding two or three miles found himself in a small fresh water river. Small as it is, it appears to me probable that it flows from the Cordilleras, the water is muddy as if flooded, & this is the time of year for the snow freshes of the Colorado, Sauce &c. Mr Chaffers saw in a little valley a lame horse, with his back marked by the saddle; so that the Indians must have left him there or were then in the neighbourhood. The views here were very fine & rude; the red porphyry rock rises from the water in perpendicular cliffs, or forms spires & pinnacles in its very course. Excepting in this respect the country is the same. At night we were all well pleased at our discovery of the little river; which, however, was no discovery as a Sealer had said some years ago that he had been up it.

30th. We got under weigh at four o'clock & reached Guanaco Island by mid-day. As the weather was cold & wet, I determined to walk to the ship. It turned out to be a very long one, from the number of inlets & creeks. The geology well repaid me for my trouble, & I found likewise a small pool of quite fresh water.

JAN. 1st. Walked to a distant hill; we found at the top an Indian grave. The Indians always bury their dead on the highest hill, or on some headland projecting into the sea. I imagine it is for this reason they come here; that they do pay occasional visits is evident, from the remains of several small fires & horses' bones near them.

2nd. A party of officers accompanied me to ransack the Indian grave in hopes of finding some antiquarian remains. The grave consisted of a heap of large stones placed with some care; it was on the summit of the hill, & at the foot of a ledge of rock about 6 feet high. In front of this & about 3 yards from it they had placed two immense fragments, each weighing at least two tuns, & resting on each other. These in all probability were originally in nearly the same position & only just moved by the Indians to answer their purpose. At the bottom of the grave on the hard rock, there was a layer of earth about a foot deep; this must have been brought from the plain below; the vegetable fibres, from the lodgement of water, were converted into a sort of peat. Above this a pavement of flat stones & then a large heap of rude stones, piled up so as to fill up the interval between the ledge & the two large stones. To complete the grave the Indians had contrived to detach



from the ledge an immense block (probably there was a crack) & throw it over the pile so as to rest on the two other great fragments. We undermined the grave on both sides under the last block; but there were no bones. I can only account for it by giving great antiquity to the grave & supposing water & changes in climate had utterly decomposed every fragment. We found on the neighbouring heights three other & much smaller heaps of stones; they had all been displaced; perhaps by sealers or other voyagers. It is said, that where an Indian dies, he is buried; but that subsequently his bones are taken up & carried to such situations as have been mentioned. I think this custom can easily be accounted for by recollecting that before the importation of horses, these Indians must have led nearly the same life as the Fuegians, & therefore in the neighbourhead of the sea. The common prejudice of lying where your ancestors have lain, would make the now roaming Indians bring the less perishable part of their dead to the ancient burial grounds.

3rd. During these days I have had some very long & pleasant walks. The Geology is interesting. I have obtained some new birds & animals. I also measured barometrically the height of the plain, which must so lately have been beneath the sea; it has an altitude of 247 feet. Yesterday I shot a large Guanaco, which must, when alive, have weighed more than 200 pounds. Two males were fighting furiously & galloping like race horses with their ears down & necks low; they did not see me & passed within 30 yards; & then I settled the contest by shooting the Persecutor.

*Diary* pp. 200-4

#### COPY OF A LETTER TO MY BROTHER HENRY

H.M.S. Beagle, March 19, 1834

The hove at this place [gives] an opportunity of forwarding letters to England, all hands are therefore busy in spinning long yarns to wives, sweethearts &c &c, and it is with much pleasure that I avail myself of it to send you a despatch. If young Parry has had a tolerable passage, you have ere this received my last from Montevideo, which place we left on the 6th Decr, making the best of our way to the southward, and on the 23d arrived at Port Desire, a fine harbour but wholly uninhabited, tho some ruins shew that the Spaniards had formerly attempted a settlement here. Our tender the Schooner underwent an alteration in her rigging, and we at the same time endeavoured to get in a fresh supply of wood and water. The country is bare and desolate in the extreme, affording us but a scanty supply of the former, and still worse of the latter, that being not only brackish but so full of animalculae that I made a practice before drinking it to kill them all with [a] certain proportion of brandy.

It must, however, be a place infinitely worse than Port Desire that will not afford amusement to men just let loose from a ship and at the same time bent upon a *lark*; and altho we had no chance of seeing men and women 8 or 10 ft high, we knew for certain that there was a good sprinkling of game in the neighbourhood, not exactly such as you have in England, but what was in our case far more acceptable, viz. guanaco, cavy and ostriches. The guanaco is an animal in some respects similar to the deer but much larger; they were exceedingly shy, but we





*Bivouac at Port Desire*

succeeded in getting one in time for a Christmas dinner. The cavy is an animal something like a hare, but much larger. I was surprised to find them all so shy, but believe it is on account of the lions, which are pretty numerous here, and to whom they are a constant prey.

The most amusing part of the time, however, was that spent in an expedition up the harbour, in order to ascertain whether it did or did not terminate in a fresh water river. A party was formed consisting of Mr Darwin the naturalist, 3 officers and myself, with 4 or 5 seamen in the yawl, with provisions for 3 days. This I enjoyed exceedingly. The weather was fine, and we generally contrived to get into some little snug creek an hour or so before sunset, where the tents were rigged, a fire lighted, and skirmishers turned out to scower the ground and bring in everything in the shape of game that could be got hold of. In short, it was a genuine bivouack, and such as I am sure you would have liked much; and indeed both there and since I have often wished that you could form one of the party. Of course, I was not exempt from taking my turn in the night watch, for altho no Indians had been seen in the neighbourhood, they are known to come over this part of the country from the northward, and from the late massacres that have taken place in the neighbourhood of Buenos Ayres, we should stand a poor chance if caught napping. The chance of these, and the certainty of lions not being far off, was sufficient to keep my fancy at work during my watch, which was only for an hour and a half; when that was over, however, I had too much confidence in my party not to sleep soundly for the rest of the night.





*'Rhea Darwinii'*

We succeeded in finding good water, but it was too far up to be of use in watering the ship, and we returned.

While here, as there was but little to be done in the way of sketching, I used generally to take my gun and was fortunate enough one day to bring home an ostrich, the only one indeed which as yet we had been able to kill, altho great numbers had been seen. It was a young one, and excellent eating.

I am happy to say that not only myself but all on board have up to this time been in excellent health, notwithstanding the variety of food which occasionally presents itself, it being allowed by all that any thing is better than our own salted beef and pork. Accordingly gulls, shaggs, and sharks, muscels, limpets and land crabbs, are seldom rejected if nothing better is to be had. Not that we are by any



means insensible to our present excellent fare, which consists of geese, ducks, snipes and beef in the greatest plenty.

\* \* \*

It would be useless here to attempt a description of all the out of the way places, wild scenes, and still wilder inhabitants of Tierra del Fuego and Patagonia. Something of the kind will be found in my letter to —. I should, rather, like to convey to you and my friends in North St a tolerable idea of the snug way in which I am domiciled on board this same little craft. Suppose me then where I am now writing, in my cabin, which by the by I must tell you is allowed to be a pattern of neatness and convenience, the door of which opens into the gunroom. It is lighted by two bulls eyes from the upper deck in the manner of a skylight, and as I am upon too familiar a footing with my messmates ever to think of shutting the door, a good deal of light comes in that way also. A tasty blue cloth curtain, however, is drawn at night, closing likewise a small window alongside of it. Facing the door, built in as it were and occupying the whole length of the cabin, is a nest of drawers of 3 tiers, above which is the bed place, particularly well adapted for those who like to lie high, being at least  $4\frac{1}{2}$  feet from the deck. The dimensions of the cabin is 6 ft long by rather more than 5 ft wide and 6 ft high. The bedplace is not very wide, being of course only intended for one person. Now fancy yourself there, and the sketch will at once finish the description. On the left of the door is my table, desk, lamp, and drawing materials. The end which is seen in perspective is occupied by books, guns, pistols, my plate, a picture, and sundry other useful articles, arranged and fixed in such a manner that the utmost motion of the vessel will not disturb. The whole is painted in imitation of oak the same as your own pretty parlour, with the exception of the drawers, which are of mahogany . . .

[From Conrad Martens's 'Notes on painting: a commonplace book on technique'.  
Dixson Library, MS. 142.]

The ostrich shot by Martens turned out to be of more than purely culinary interest, as Darwin explains.

The first notice I received of this species was at the Rio Negro, in Northern Patagonia, where I repeatedly heard the Gauchos talking of a very rare bird, called *Avestruz Petise*. They described it as being less than the common ostrich (which is there abundant), but with a very close general resemblance. They said its colour was dark and mottled, and that its legs were shorter, and feathered lower down than those of the common ostrich. It is more easily caught by the bolas than the other species. The few inhabitants who had seen both kinds, affirmed that they could distinguish them apart, from a long distance. The eggs, however, of the small species appeared more generally known, and it was remarked with surprise, that they were very little less than those of the common *Rhea*, but of a slightly different form, and with a tinge of pale blue. Some eggs which I picked up on the plains of Patagonia, agree pretty well with this description; and I do not doubt are those of the Petise. This species occurs most rarely in the neighbourhood of the Rio Negro; but about a degree and a half further south they are tolerably



abundant. One Gaucho, however, told me he distinctly recollected having seen one, many years before, near the mouth of the Rio Colorado, which is north of the Rio Negro. They are said to prefer the plains near the sea. When at Port Desire in Patagonia (Lat.  $48^{\circ}$ ), Mr Martens shot an ostrich; I looked at it, and from most unfortunately forgetting at the moment, the whole subject of the Petises, thought it was a two-third grown one of the common sort. The bird was skinned and cooked before my memory returned. But the head, neck, legs, wings, many of the larger feathers, and a large part of the skin, had been preserved. From these a very nearly perfect specimen has been put together, and is now exhibited in the museum of the Zoological Society. M. A. D'Orbigny, a distinguished French naturalist, when at the Rio Negro, made great exertions to procure this bird, but had not the good fortune to succeed. He mentions it in his *Travels* (vol. ii. p. 76.) and proposes (in case, I presume, of his obtaining a specimen at some future time, and thus being able to characterize it,) to call it *Rhea pennata*. A notice of this species was given long since (AD 1749) by Dobrizhoffer, in his account of the Abipones (vol. i. Eng. Trans. p. 314). He says, 'You must know, moreover, that Emus differ in size and habits in different tracts of land; for those that inhabit the plains of Buenos Ayres and Tucuman are larger, and have black, white, and grey feathers; those near to the Strait of Magellan are smaller, and more beautiful, for their white feathers are tipped with black at the extremity, and their black ones in like manner terminate in white.'

Among the Patagonian Indians in the Strait of Magellan, we found a halfbred Indian, who had lived some years with this tribe, but had been born in the northern provinces. I asked him if he had ever heard of the Avestruz Petise? He answered by saying, 'Why there are none others in these southern countries.' He informed me that the number of eggs in the the nest of the Petise is considerably less than with the other kind, namely, not more than fifteen on an average; but he asserted that more than one female deposited them. At Santa Cruz we saw several of these birds. They were excessively wary: I think they could see a person approaching, when he was so far off as not to distinguish the ostrich. In ascending the river few were seen; but in our quiet and rapid descent, many, in pairs and by fours or fives, were observed. It was remarked by some of the officers, and I think with truth, that this bird did not expand its wings, when first starting at full speed, after the manner of the northern kind. The fact of these ostriches swimming across the river has been mentioned. In conclusion, I may repeat that the *R. Americana* inhabits the eastern plains of S. America as far as a little south of the Rio Negro, in lat.  $41^{\circ}$ , and that the *R. Darwinii* takes its place in Southern Patagonia; the part about the Rio Negro being neutral territory. Wallis saw ostriches at Bachelor's river (lat  $53^{\circ} 54'$ ), in the Strait of Magellan, which must be the extreme southern possible range of the Petise.

*Zoology* pp. 124-5

While the *Adventure* stayed at Port Desire remaking her sails, the *Beagle* surveyed the coast southwards to Port St Julian. There FitzRoy and Darwin landed to look for water.



JAN. 4th, 1834. In working out of Port Desire, the Beagle struck her fore-foot heavily against a rock, so as to shake her fore and aft; but on she went with the tide, and as she made no water, I did not think it worth while returning into port. I was instantly convinced that we had hit the very rock on which the Beagle struck in 1829, in the night – a danger we never again could find by daylight till this day, when I was, rather imprudently, going out with the last quarter-ebb. At low-water there are but eight feet on this rock, which is not far from mid-channel, just without the entrance.

We anchored near Watchman Cape, and in other places along the coast, before reaching Port San Julian, and some time was devoted to an examination of the Bellaco Rock and its vicinity, as there is a dangerous reef extending from Watchman Cape towards, but not quite out to the Bellaco.

In my own notes I find this rock mentioned as ‘almost covered at times, but occasionally showing above water as high as the hull of a ship!’ In Mr Stokes’s journal, left with me, it is mentioned in these words: ‘Passed between the Bellaco Rocks, close to the eastern one, nearly a-wash’; and in the diary of the Nodales’ voyage (in 1619), it is spoken of as ‘una baxa que lababa la mar en ella’, which means, a rock a-wash. The rise of tide there is about twenty feet, which explains the various appearances it had to my eye; for at high water I saw it almost covered, or a-wash; and as the Nodales described it similarly in 1619, there can have been extremely little, if any, change in the relative heights of sea and land in this place during the last two hundred and fifteen years. Some time ago I thought differently, having formed a hasty opinion upon the fact of my having seen the rock as high out of water as a ship’s hull. I did not then consider how much the tide falls, nor did I recollect, till I referred to notes, that I had also seen it a-wash (the top almost level with the water), at times during the many days we were in the neighbourhood.

On the day that Mr Stokes and myself made our respective notes on the Bellaco (without any communication of opinion), an extraordinary effect of refraction was remarked. The meridian altitude of the sun (then far south) observed at opposite horizons, differed no less than sixteen miles! Similar effects had been noticed before, especially on the Patagonian coast, therefore we generally observed both ways; but to nearly such an extent as this we never either before or afterwards witnessed an error arising wholly from the state of the atmosphere near the horizon; causing the visible water-line to be apparently raised several minutes of a degree. On these occasions we always used the mean of the two results, which agreed closely with the latitude resulting from triangular connection with points on the shore, whose latitude we knew by observations made with the artificial horizon.

*Narrative* 2 pp. 317–19

JAN. 9th. Mount Wood, that excellent land-mark for Port San Julian, was seen at daylight: and about noon the Beagle anchored off the bar of the harbour. Mr Stokes went with me to examine the passage, and before evening our ship was safely moored in the port. This was one, among numerous instances I could





*Entrance to Port St Julian*

mention, where the good qualities of the Beagle, as to sailing and working, saved us days of delay, trouble, and anxiety. All hands immediately set-to about the plan of the port, and such efficient officers as were with me made short work of it. One day Mr Darwin and I undertook an excursion in search of fresh-water, to the head of the inlet, and towards a place marked in an old Spanish plan, 'pozos de agua dulce'; but after a very fatiguing walk not a drop of water could be found. I lay down on the top of a hill, too tired and thirsty to move farther, seeing two lakes of water, as we thought, about two miles off, but unable to reach them. Mr Darwin, more accustomed than the men, or myself, to long excursions on shore, thought he could get to the lakes, and went to try. We watched him anxiously from the top of the hill, saw him stoop down at the lake, but immediately leave it and go on to another, that also he quitted without delay, and we knew by his slow returning pace that the apparent lakes were 'salinas'. We then had no alternative but to return, if we could, so descending to meet him at one side of the height, we all turned eastward and trudged along heavily enough. The day had been so hot that our little stock of water was soon exhausted, and we were all more or less laden with instruments, ammunition, or weapons. About dusk I could move no farther, having foolishly carried a heavy double-barrelled gun all day besides instruments, so, choosing a place which could be found again, I sent the party on and lay down to sleep; one man, the most tired next to myself, staying with me. A glass of water would have made me quite fresh, but it was not to be had. After some hours, two of my boat's crew



returned with water, and we were very soon revived. Towards morning we all got on board, and no one suffered afterwards from the over-fatigue, except Mr Darwin, who had no rest during the whole of that thirsty day – now a matter of amusement, but at the time a very serious affair.

*Narrative* 2 pp. 319–20

JAN. 11th. Again I started with the Captain to the head of the harbor. It suddenly came on to blow hard, so the Captain ran the boat on shore & we & four of the boat's crew all armed proceeded on foot. It turned out to [be] a very long walk; in the evening two of the party could not walk any further & we were all excessively tired. It was caused by a most painful degree of thirst; & as we were only 11 hours without water, I am convinced it must be from the extreme dryness of the atmosphere. Earlier in the day we experienced a great mortification; a fine lake was seen from a hill; I & one of the men volunteered to walk there, & not till quite close did we discover that it was a field solid of snow-white salt. The whole party left their arms with the two who were knocked up & returned to the boat. Fresh men were then sent off with some water & we made a signal fire, so that by 11 o'clock we were all collected & returned to the Ship. I was not much tired although I reached the boat in the first division; but the two next days (12th & 13th) was very feverish in bed.

14th. Went out walking, & found some fine fossil shells. The country precisely resembles that of Port Desire. It is a little more uneven, & from the absence even of brackish water, there are fewer animals. The Guanacoe who drinks salt water is of course to be seen. Two things have been found here for which we cannot account: on a low point there is a large Spanish oven built of bricks, & on the top of a hill a small wooden cross was found. Of what old navigators these are the relics it is hard to say. Magellan was here & executed some mutineers; as also did Drake & called the island 'true justice'.

*Diary* pp. 205–6

The *Beagle* sailed back to Port Desire on January 19th.

20th. I landed directly the ship came to an anchor, & had some collecting. On an headland projecting into the sea I found a heap of stones similar to the ones already described. There was a tooth & head of thigh bone, all crumbling into earth; in a few years no traces would be left. This explains the apparent absence of bones in the grave made with so much labor, on the top of the hill.

The *Adventure* is ready for sea & with her new square top-sail will doubtless sail well.

*Diary* p. 206

On January 22nd the *Beagle* and *Adventure* parted company, the one to continue surveying in Tierra del Fuego while the other worked in the Falkland Islands. The *Beagle* entered the Strait of Magellan, and after spending a few days at Gregory Bay, anchored at Port Famine on February 2nd.



FEB. 6th. I left the ship at four o'clock in the morning to ascend Mount Tarn; this is the highest land in this neighbourhood being 2,600 feet above the sea. For the two first hours I never expected to reach the summit. It is necessary always to have recourse to the compass: it is barely possible to see the sky & every other landmark which might serve as a guide is totally shut out. In the deep ravines the death-like scene of desolation exceeds all description. It was blowing a gale of wind, but not a breath stirred the leaves of the highest trees; everything was dripping with water; even the very Fungi could not flourish. In the bottom of the valleys it is impossible to travel, they are barricaded & crossed in every direction by great mouldering trunks: when using one of these as a bridge your course will often be arrested by sinking fairly up to the knee in the rotten wood; in the same manner it is startling to rest against a thick tree & find a mass of decayed matter is ready to fall with the slightest blow. I at last found myself amongst the stunted trees & soon reached the bare ridge which conducted me to the summit. Here was a true Tierra del Fuego view; irregular chains of hills, mottled with patches of snow; deep yellowish-green valleys, & arms of the sea running in all directions; the atmosphere was not however clear, & indeed the strong wind was so piercingly cold, that it would prevent much enjoyment under any circumstances. I had the good luck to find some shells in the rocks near the summit. Our return was much easier as the weight of the body will force a passage through the underwood; & all the slips & falls are in the right direction.

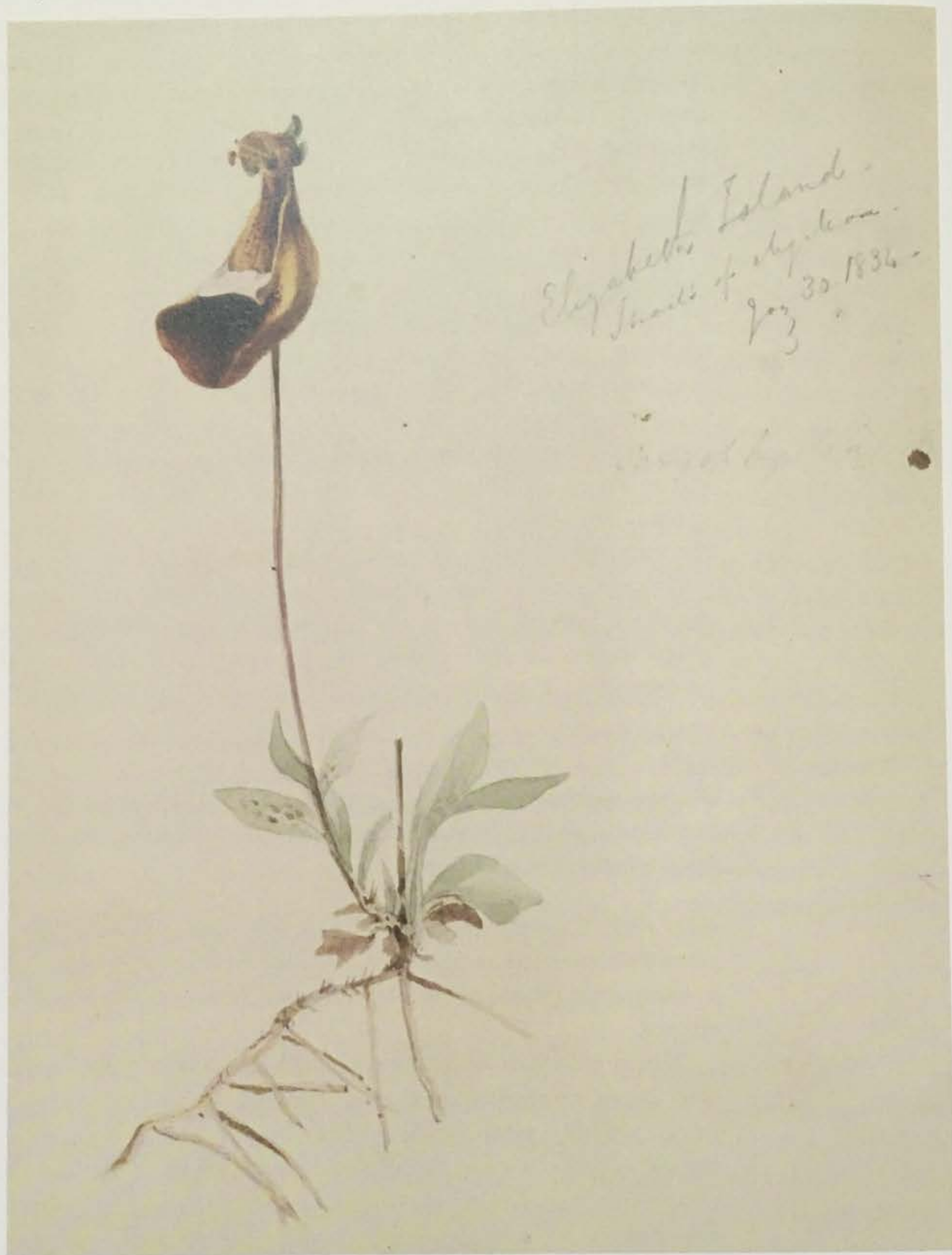
*Diary* pp.208-9

Having surveyed the north-eastern shores of Tierra del Fuego, the *Beagle* sailed south through the Strait of Le Maire, and on February 25th anchored off Wollaston Island. Darwin went ashore.

FEB. 24th. Came to anchor in the evening under Woollaston Isd. (25th.) I walked or rather crawled to the tops of some of the hills; the rock is not slate, & in consequence there are but few trees; the hills are very much broken & of fantastic shapes.

Whilst going on shore, we pulled alongside a canoe with 6 Fuegians. I never saw more miserable creatures; stunted in their growth, their hideous faces bedaubed with white paint & quite naked. One full aged woman absolutely so, the rain & spray were dripping from her body. Their red skins filthy & greasy, their hair entangled, their voices discordant, their gesticulation violent & without any dignity. Viewing such men, one can hardly make oneself believe that they are fellow creatures placed in the same world. I can scarcely imagine that there is any spectacle more interesting & worthy of reflection, than one of these unbroken savages. It is a common subject of conjecture, what pleasure in life some of the less gifted animals can enjoy? How much more seasonably it may be asked with respect to these men. To look at the Wigwam; any little depression in the soil is chosen, over this a few rotten trunks of trees are placed, & to windward some tufts of grass. Here 5 or 6 human beings, naked & uncovered from the wind, rain & snow in this tempestuous climate, sleep on the wet ground, coiled up like





*Flower found on Elizabeth Island*

animals. In the morning they rise to pick shell fish at low water; & the women, winter & summer, dive to collect sea eggs; such miserable food is eked out by tasteless berries & Fungi. They are surrounded by hostile tribes speaking different dialects; & the cause of their warfare would appear to be the means of subsistence. Their country is a broken mass of wild rocks, lofty hills & useless





*Port Famine and Mount Tarn*

forests, & these are viewed through mists & endless storms. In search of food they move from spot to spot, & so steep is the coast, this must be done in wretched canoes. They cannot know the feeling of having a home, & still less that of domestic affection; without, indeed, that of a master to an abject, laborious slave can be called so. How little can the higher powers of the mind come into play: what is there for imagination to paint, for reason to compare, for judgement to decide upon? To knock a limpet from the rock does not even require cunning, that lowest power of the mind. Their skill, like the instinct of animals, is not improved by experience; the canoe, their most ingenious work, poor as it may be, we know has remained the same for the last 300 years. Although essentially the same creature, how little must the mind of one of these beings resemble that of an educated man. What a scale of improvement is comprehended between the faculties of a Fuegian savage & a Sir Isaac Newton! Whence have these people come? Have they remained in the same state since the creation of the world? What could have tempted a tribe of men leaving the fine regions of the North to travel down the Cordilleras, the backbone of America, to invent & build canoes, & then to enter upon one of the most inhospitable countries in the world? Such & many other reflections must occupy the mind of every one who views one of these poor savages. At the same time, however, he may be aware that some of them are erroneous. There can be no reason for supposing the race of Fuegians are



decreasing, we may therefore be sure that he enjoys a sufficient share of happiness (whatever its kind may be) to render life worth having. Nature, by making habit omnipotent, has fitted the Fuegian to the climate & productions of his country.

*Diary* pp. 212-13

The *Beagle* sailed back through Goree Road into the eastern end of Beagle Channel, and then along the Channel to Ponsonby Sound, in order to visit the settlement at Woollya where Jemmy Button had been left thirteen months earlier.

Till the 5th [March] the *Beagle* was actively occupied, by day, in working to windward (westward) through the channel, and then she anchored at Woollya. But few natives were seen as we sailed along: probably they were alarmed at the ship, and did not show themselves. The wigwams in which I had left York, Jemmy, and Fuegia, were found empty, though uninjured: the garden had been trampled over, but some turnips and potatoes of moderate size were pulled up by us, and eaten at my table, a proof that they may be grown in that region. Not a living soul was visible any where; the wigwams seemed to have been deserted many months; and an anxious hour or two passed, after the ship was moored, before three canoes were seen in the offing, paddling hastily towards us, from the place now called Button Island. Looking through a glass I saw that two of the natives in them were washing their faces, while the rest were paddling with might and main: I was then sure that some of our acquaintances were there, and in a few minutes recognized Tommy Button, Jemmy's brother. In the other canoe was a face which I knew yet could not name. 'It must be some one I have seen before,' said I, when his sharp eye detected me, and a sudden movement of the hand to his head (as a sailor touches his hat) at once told me it was indeed Jemmy Button – but how altered! I could hardly restrain my feelings, and I was not, by any means, the only one so touched by his squalid miserable appearance. He was naked, like his companions, except a bit of skin about his loins; his hair was long and matted, just like theirs; he was wretchedly thin, and his eyes were affected by smoke. We hurried him below, clothed him immediately, and in half an hour he was sitting with me at dinner in my cabin, using his knife and fork properly, and in every way behaving as correctly as if he had never left us. He spoke as much English as ever, and, to our astonishment, his companions, his wife, his brothers and their wives, mixed broken English words in their talking with him. Jemmy recollected every one well, and was very glad to see them all, especially Mr Bynoe and James Bennett. I thought he was ill, but he surprised me by saying that he was 'hearty, sir, never better', that he had not been ill, even for a day, was happy and contented, and had no wish whatever to change his way of life. He said that he got 'plenty fruits', 'plenty birdies', 'ten guanaco in snow time', and 'too much fish'. Besides, though he said nothing about her, I soon heard that there was a good-looking young woman in his canoe, who was said to be his wife. Directly this became known, shawls, handkerchiefs, and a gold-laced cap appeared, with which she was speedily decorated; but fears had been excited for her husband's safe return to her, and no finery could stop her crying until Jemmy again showed





*Beagle Channel*

himself on deck. While he was below, his brother Tommy called out in a loud tone – ‘Jemmy Button, canoe, come!’ After some time the three canoes went ashore, laden with presents, and their owners promised to come again early next morning. Jemmy gave a fine otter skin to me, which he had dressed and kept purposely; another he gave to Bennett.

Next morning Jemmy shared my breakfast, and then we had a long conversation by ourselves; the result of which was, that I felt quite decided not to make a second attempt to place Matthews among the natives of Tierra del Fuego. Jemmy told me that he knew very little of his own language; that he spoke some words of English, and some Tekeenica, when he talked to his family; and that they all understood the English words he used. York and Fuegia left him some months before our arrival, and went in a large canoe to their own country; the last act of that cunning fellow was to rob poor Jemmy of all his clothes; nearly all the tools his Tekeenica ‘friends’ had left him; and various other necessities. Fuegia was dressed as usual, and looking well, when they decamped: her helpmate was also well clothed, and had hardly lost anything I left with him. Jemmy said ‘York very much jaw’, ‘pick up big stones’, ‘all men afraid’. Fuegia seemed to be very happy, and quite contented with her lot. Jemmy asserted that she helped to ‘catch (steal)





*Fuegians in the Beagle Channel*

his clothes', while he was asleep, the night before York left him naked.

Not long after my departure in February 1833, the much-dreaded Oens-men came in numbers, overland, to Woollya; obliged Jemmy's tribe to escape to the small islands, and carried off every valuable which his party had not time to remove. They had doubtless heard of the houses and property left there, and hastened to seize upon it – like other 'borderers'. Until this time York had appeared to be settled, and quite at ease, but he had been employed about a suspiciously large canoe, just finished when the inroad was made. He saved this canoe, indeed escaped in it, and afterwards induced Jemmy and his family to accompany him 'to look at his land'. They went together in four canoes (York's large one and three others) as far west as Devil Island, at the junction of the north-west and south-west arms of the Beagle Channel: there they met York's brother and some others of the Alikhoolip tribe; and, while Jemmy was asleep, all the Alikhoolip party stole off, taking nearly all Jemmy's things, and leaving him in his original condition. York's fine canoe was evidently not built for transporting himself alone; neither was the meeting with his brother accidental. I am now quite sure that from the time of changing his mind, and desiring to be placed at Woollya, with Matthews and Jemmy, he meditated taking a good opportunity of possessing himself of every thing; and that he thought, if he were left in his own country without Matthews, he would not have many things given



to him, neither would he know where he might afterwards look for and plunder poor Jemmy.

While Mr Bynoe was walking about on shore, Jemmy and his brother pointed out to him the places where our tents were pitched in 1833, where the boundary line was, and where any particular occurrence happened. He told Mr Bynoe that he had watched day after day for the sprouting of the peas, beans, and other vegetables, but that his countrymen walked over them without heeding any thing he said. The large wigwams which we had erected with some labour, proved to be cold in the winter, because they were too high; therefore they had been deserted after the first frosts. Since the last depredations of the Oens-men, he had not ventured to live any longer at Woollya; his own island, as he called it, affording safer refuge and sufficient food.

Jemmy told us that these Oens-men crossed over the Beagle Channel, from eastern Tierra del Fuego, in canoes which they seized from the Yapoo Tekeenica. To avoid being separated they fastened several canoes together, crossed over in a body, and when once landed, travelled over-land and came upon his people by surprise, from the heights behind Woollya. Jemmy asserted that he had himself killed one of his antagonists. It was generally remarked that his family were become considerably more humanized than any savages we had seen in Tierra del Fuego: that they put confidence in us; were pleased by our return; that they were ready to do what we could explain to be for their interest; and, in short, that the first step towards civilization – that of obtaining their confidence – was undoubtedly made: but an individual, with limited means, could not then go farther. The whole scheme, with respect to establishing a missionary with the Fuegians who were in England, among their countrymen, was on too small a scale, although so earnestly assisted by Mr Wilson, Mr Wigram, Mr Coates, and other kind friends.

I cannot help still hoping that some benefit, however slight, may result from the intercourse of these people, Jemmy, York, and Fuegia, with other natives of Tierra del Fuego. Perhaps a ship-wrecked seaman may hereafter receive help and kind treatment from Jemmy Button's children; prompted, as they can hardly fail to be, by the traditions they will have heard of men of other lands; and by an idea, however faint, of their duty to God as well as their neighbour.

That Jemmy felt sincere gratitude is, I think, proved by his having so carefully preserved two fine otter skins, as I mentioned; by his asking me to carry a bow and quiver full of arrows to the schoolmaster of Walthamstow, with whom he had lived; by his having made two spear-heads expressly for Mr Darwin; and by the pleasure he showed at seeing us all again.

As nothing more could be done, we took leave of our young friend and his family, every one of whom was loaded with presents, and sailed away from Woollya.



On March 10th the *Beagle* anchored once more in Berkeley Sound, to be greeted with the news that their friend Mr Brisbane, who had helped them the previous year, had been brutally murdered on August 26th. However, Lieutenant Smith of the Royal Navy had subsequently managed to restore order.

MARCH 10th. Arrived in the middle of the day at Berkeley Sound, having made a short passage by scudding before a gale of wind. Mr Smith, who is acting as Governor, came on board, & has related such complicated scenes of cold-blooded murder, robbery, plunder, suffering, such infamous conduct in almost every person who has breathed this atmosphere, as would take two or three sheets to describe. With poor Brisbane, four others were butchered; the principal murderer, Antuco, has given himself up; he says he knows he shall be hanged but he wishes some of the Englishmen who were implicated, to suffer with him; pure thirst for blood seems to have incited him to this latter act. Surrounded as Mr Smith is with such a set of villains, he appears to be getting on with all his schemes admirably well.

*Diary* pp.216-17

When I visited the settlement it looked more melancholy than ever; and at two hundred yards' distance from the house in which he had lived, I found, to my horror, the feet of poor Brisbane protruding above the ground. So shallow was his grave that dogs had disturbed his mortal remains, and had fed upon the corpse. This was the fate of an honest, industrious, and most faithful man: of a man who feared no danger, and despised hardships. He was murdered by villains, because he defended the property of his friend; he was mangled by them to satisfy their hellish spite; dragged by a lasso, at a horse's heels, away from the houses, and left to be eaten by dogs.

*Narrative* 2 p.332

The *Adventure* joined them on March 13th, and the two ships spent the next three weeks putting the finishing touches to their survey of the Falkland Islands. Darwin explored the interior of the Islands, and left some letters to be picked up by the next ship bound for England.

MARCH 16th. Early in the morning I set out with 6 horses & two Gauchos. These were the only two Spaniards who were not directly concerned with the murder; but I am afraid my friends had a very good idea of what was going to take place. However, they had no temptation to murder me & turned out to be most excellent Gauchos. That is, they were dexterous hands in all the requisites of making the camp-life comfortable. The weather was very boisterous & cold, with heavy hailstorms; we got on, however, pretty well. Excepting some little geology nothing could be less interesting. The country is uniformly the same; an undulating moorland; the surface covered with light brown withered grass, & some few very low shrubs all growing out of an elastic peaty soil. There is one main range of quartz rock hills, whose broken barren crests gave us some trouble



to cross. Few sorts of birds inhabit this miserable looking country: there are many small flocks of geese feeding in the valleys, & solitary snipes are common in all parts. On the South side of the range of hills we came into the best country for the wild cattle; we did not however see very many, because the Murderers had by hunting them so much, driven them amongst the mountains. These men only killed the cows, & then took out the tongue & piece of meat from the breast, when this was finished they killed another. By their own account they must have killed more than 200 head. We saw plenty of the half decayed carcasses. In the evening we came across a nice little herd. St Jago soon separated a fat cow, he threw his balls, they hit her legs, but did not entangle her: he dropped his hat to mark the place where the balls fell, uncoiled his lazo & again we commenced the chase; at last he caught her round the horns. The other Gaucho had gone on with the horses, so that St Jago had some difficulty in killing the furious beast. The horses generally soon learn for their own safety to keep the lazo tight when their rider dismounts, when this is the case the man can easily hamstring & thus secure the beast. Here the horse would not stand still, & it was admirable to see with what dexterity St Jago dodged about the cow till he contrived to give the fatal touch to the main tendon of the hind leg. After which driving his knife into the head of the spinal marrow the animal dropped as if struck by lightning. St Jago cut off enough flesh with the skin, & without any bones, to last for our expedition. We then rode on to our sleeping place. Meat roasted with its skin ('carne con cuero') is known over all these parts of S. America for its excellence. It bears the same relation to common beef, which venison does to mutton. I am sure if any worthy alderman was once to taste it; 'carne con cuero' would soon be celebrated in London. During the night it rained, & (17th) the next day was very stormy with much hail & snow.

From the number of cows which have been killed there is a much larger proportion of bulls. These wander about by two & threes or by themselves & are very savage. I never saw such magnificent beasts; they truly resemble the ancient sculptures, in which the vast neck & head is but seldom seen amongst tame animals. The young bulls run away for a short distance, but the old ones will not stir a step excepting to rush at man & horse; & many horses have thus been killed. One old bull crossed a boggy stream & took up his stand on the side opposite to us. We in vain tried to drive him away & failing were obliged to make a large circuit. The Gauchos in revenge were determined to render him for the future innocuous; it was very interesting to see how art completely mastered huge force. One lazo was thrown over his horns as he rushed at the horse, & another round his hind legs; in a minute the monster was stretched harmless on the ground.

During the whole time we only saw one troop of wild horses & this was to the North of the hills. It is [a] curious thing that these horses although very numerous always remain in the East end of the island. The Gauchos cannot account for it. We slept in a valley in the neck of land which joins the Rincon del Toro, the great peninsula to the S.W. point of the island. The valley was pretty well sheltered from the cold wind; but there was very little brushwood for making a fire; the Gauchos soon found what to my surprise made nearly as hot a fire as coals. It was



the bones of a bullock, lately killed but all the flesh picked off by the Vultures. They told me that in winter time they have often killed an animal, cleaned the flesh from the bones with their knives, & then with these very bones roasted the meat for the dinner. What curious resources will necessity put men to discover.

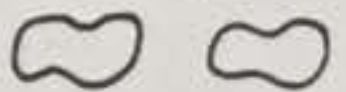
*Diary* pp. 217-19

C.D. TO PROFESSOR HENSLOW

E. Falkland Isd. March 1834

My dear Henslow

Upon our arrival at this place I was delighted at receiving your letter dated Aug. 31. Nothing for a long time has given me so much pleasure. Independent of the pleasure, your account of the arrival of my second cargo & that some of the specimens were interesting, has been, as you may well suppose, most highly satisfactory to me. I am quite astonished that such miserable fragments of the Megatherium should have been worth all the trouble Mr Clift has bestowed on them. I have been alarmed at the expression cleaning all the bones, as I am afraid the printed numbers will be lost: the reason I am so anxious they should not be, is that a part were found in a gravel with recent shells, but others in a very different bed; how with these latter there were no bones of an Agouti, a genus of animals I believe now peculiar to America, & it would be curious to prove some one of the same genus co-existed with the Megatherium; such & many other points *entirely* depend on the numbers being carefully preserved. My entire ignorance of comparative Anatomy makes me quite dependent on the numbers: so that you will see my geological notes will be useless without I am certain to what specimens I refer.

Since receiving these specimens you ought to have received two other cargos, shipped from Plata in July & November 1833. With the latter there was a heavy box of fossil remains, which is now I suppose at Plymouth. I followed this plan from not liking to give you so much trouble: it contains another imperfect Megatherium head, & some part of the skeleton of an animal, of which I formerly sent the jaw, which had four teeth on each side in shape  like this. I am anxious to know to what it belongs. Shortly before I left M. Video I bought far up in the country for two shillings a head of a Megatherium which must have been when found quite perfect. The Gauchos however broke the teeth & lost the lower jaw, but the lower & internal parts are tolerably perfect. It is now, I hope, on the high seas in pursuit of me. It is a most flattering encouragement to find men, like Mr Clift, who will take such interest in what I send home.

I am very glad the plants give you any pleasure; I do assure you I was so ashamed of them, I had a great mind to throw them away; but if they give you any pleasure I am indeed bound, & will pledge myself to collect whenever we are in parts not often visited by Ships & Collectors. I collected all the plants, which were in flower on the coast of Patagonia at Port Desire & St Julian; also on the Eastern parts of Tierra del Fuego, where the climate & features of T. del Fuego & Patagonia are united. With them are as many seeds, as I could find (you had better plant all the rubbish which I send, for some of the seeds are very small). The soil of



Patagonia is *very* dry, *gravelly* & light – in East Tierra, it is gravelly, peaty & damp. Since leaving the R. Plata, I have had some opportunities of examining the great Southern Patagonian formation. I have a good many shells; from the little I know of the subject, it must be a Tertiary formation for some of the shells & (Corallines?) now exist in the sea – & others I believe do not. This bed, which is chiefly characterised by a great Oyster is covered by a very curious bed of Porphyry pebbles, which I have traced for more than 700 miles; but the most curious fact is that the whole of the East coast of South part of S. America has been elevated from the ocean, since a period, during which Muscles have not lost their blue color.

At Port St Julian I found some very perfect bones of some large animal, I fancy a Mastodon – the bones of one hind extremity are very perfect & solid. This is interesting as the Latitude is between  $49^{\circ}$  &  $50^{\circ}$  & the site is so far removed from the great Pampas where bones of the narrow toothed Mastodon are so frequently found. By the way this Mastodon & the Megatherium, I have no doubt, were fellow brethren in the ancient plains. Relics of the Megatherium I have found at a distance of nearly 600 miles apart in a N. & S. line. In Tierra del Fuego I have been interested in finding some sort of Ammonite (also I believe found by Capt. King) in the Slate near Port Famine; & on the Eastern coast there are some curious alluvial plains, by which the existence of certain quadrupeds in the islands can clearly be accounted for. There is a sandstone, with the impression of the leaves like the common Beech tree also modern shells, etc etc. On the surface of which table land there are, as usual, muscles with their blue color etc. This is the *report* of my *geological* section! to you my President & Master. I am quite charmed with Geology but like the wise animal between two bundles of hay, I do not know which to like the best, the old crystalline group of rocks or the softer & fossiliferous beds. When puzzling about stratification etc, I feel inclined to cry a fig for your big oysters & your bigger Megatheriums. But then when digging out some fine bones, I wonder how any man can tire his arms with hammering granite. By the way I have not one clear idea about cleavage, stratification, lines of upheaval. I have no books, which tell me much & what they do I cannot apply to what I see. In consequence I draw my own conclusions, & most gloriously ridiculous ones they are; I sometimes fancy I shall persuade myself there are no such things as mountains, which would be a very original discovery to make in Tierra del Fuego. Can you throw any light into my mind, by telling me what relation cleavage & planes of deposition bear to each other?

And now for my second *section* Zoology. I have chiefly been employed in preparing myself for the South sea, by examining the Polypi of the smaller Corallines in these latitudes. Many in themselves are very curious, & I think are quite undescribed, there was one appalling one, allied to a Flustra which I daresay I mentioned having found to the Northward, where the cells have a moveable organ (like a Vultures head, with a dilatable beak), fixed on the edge. But what is of more general interest is the unquestionable (as it appears to me) existence of another species of ostrich, besides the Struthio Rhea. All the Gauchos & Indians state it is the case: & I place the greatest faith in their observations. I have the



head, neck, piece of skin, feathers, & legs of one. The differences are chiefly in color of feathers, & scales on legs, being feathered below the knees; nidification & geographical distribution.

So much for what I have lately done; the prospect before me is full of sunshine: fine weather, glorious scenery, the geology of the Andes; plains abounding with organic remains (which perhaps I may have the good luck to catch in the very act of moving); & lastly an ocean & its shores abounding with life. So that, if nothing unforeseen happens, I will stick to the voyage; although, for what I can see, this may last till we return a fine set of white-headed old gentlemen. I have to thank you most cordially for sending me the Books. I am now reading the Oxford Report – the whole account of your proceedings is most glorious; You, remaining in England, cannot well imagine how excessively interesting I find the reports; I am sure, from my own thrilling sensations, when reading them, that they cannot fail to have an excellent effect, upon all those residing in distant colonies, & who have little opportunity of seeing the Periodicals. My hammer has flown with redoubled force on the devoted blocks; as I thought over the eloquence of the Cambridge President I hit harder & harder blows. I hope, to give my arm strength for the Cordilleras, you will send me, through Capt. Beaufort, a copy of the Cambridge Report.

I have forgotten to mention, that for some time past & for the future, I will put a pencil cross on the pill-boxes containing insects, as these alone will require being kept particularly dry, it may perhaps save you some trouble. When this letter will go, I do not know, as this little seat of discord has lately been embroiled by a dreadful scene of murder & at present there are more prisoners, than inhabitants. If a merchant vessel is chartered to take them to Rio I will send some specimens (especially my few plants & seeds). Remember me to all my Cambridge friends. I love & treasure up every recollection of dear old Cambridge. I am much obliged to you for putting my name down to poor Ramsay's monument – I never think of him without the warmest admiration. Farewell my dear Henslow –

believe my [me] your most obliged & affectionate friend.

Charles Darwin.

N.B. What I have said about the numbers attached to the fossils, applies to every part of my collections. Videlicet. Colors of all the Fish: habits of birds etc etc:

There is no opportunity of sending a cargo: I only send this, with the seeds, some of which I hope may grow, & show the nature of the plants far better than my Herbarium. They go through Capt. Beaufort: give Mr Whewell my best thanks for sending me his tide paper: all on board are much interested by it. Remember me most kindly to Mrs Henslow & Leonard Jenyns.



There is nothing like geology: the pleasure of the first days particularly shooting on first days hunting cannot be compared to finding a fine group of fossil bones, which tell their story of former times with almost a living tongue.

After entering the St of Magellan; we had a very interesting interview with the Patagonians, the giants of the older navigators; they are a very fine set of men, & from their large guanaco mantles & long flowing hair, have a very imposing appearance. — Very few, however, were over 6 feet high, but broad across the shoulders in proportion to this. — They have so much intercourse with Sealers & Whalers, that they are semi-civilized: one of them who dined with us eat with his knife & fork as well as any gentleman. — Many of them could talk a little Spanish. — For observations we ran on to P. Fabian; justly so called for the terrible sufferings of Savignoles along. — If this there is not now the least vestige: every thing is covered up by the deep entangled forest of Beech. We then returned to the outside coast & completed the Chart of the Eastern side: When this was finished



C.D. TO MISS CATHERINE DARWIN

East Falkland Isd. April 6th 1834

My dear Catherine,

When this letter will reach you I know not – but probably some man of war will call here before in the common course of events I should have another opportunity of writing. I have received your letter dated Sept 27th 1833 & Caroline's before that. Since leaving the Plata we have had pretty fine weather, & a very pleasant cruize. The gales have not been half so spiteful or so furious this year as last. We reached Port Desire without one, & there we staid for about three weeks. We also went to Port St Julian. I was exceedingly glad to have these opportunities of seeing Patagonia: it is a miserable country, great sterile plains abounding with salt & inhabited by scarcely any animals but the Guanaco. I was very lucky & managed to kill a couple of these animals, one of which gave us fresh meat for dinner on Christmas day. The geology of this district abounds with interest; the recent elevation of this whole side of S. America can be most clearly proved. At Port St Julian I had the good fortune to find some very perfect bones of what I believe is some sort of Mastodon or Elephant. There is nothing like geology; the pleasure of the first day's partridge shooting or first day's hunting cannot be compared to finding a fine group of fossil bones, which tell their story of former times with almost a living tongue.

After entering the Sts of Magellan, we had a very interesting interview with the Patagonians, the giants of the older navigators; they are a very fine set of men, & from their large Guanaco mantles & long flowing hair, have a very imposing appearance. Very few, however, were over 6 feet high, but broad across the shoulders in proportion to this. They have so much intercourse with Sealers & Whalers, that they are semi-civilized: one of them who dined with us eat with his knife & fork as well as any gentleman. Many of them could talk a little Spanish.

For observations we ran on to P. Famine, justly so called from the terrible sufferings of Sarmiento's colony. Of this there is not now the least vestige; everything is covered up by the deep entangled forest of Beech. We then returned to the outside coast & completed the Chart of the Eastern side. When this was finished, after visiting some of the Southern islands, we beat up through the magnificent scenery of the Beagle channel to Jemmy Button's country. We could hardly recognize poor Jemmy; instead of the clean, well-dressed stout lad we left him, we found him a naked thin squalid savage. York & Fuegia had moved to their own country some months ago; the former having stolen all Jemmy's clothes. Now he had nothing, excepting a bit of blanket round his waist. Poor Jemmy was very glad to see us & with his usual good feeling brought several presents (otter skins which are most valuable to themselves) for his old friends. The Captain offered to take him to England, but this, to our surprise, he at once refused: in the evening his young wife came alongside & showed us the reason: He was quite contented. Last year in the height of his indignation he said 'his country, people no *sabe* nothing – damned fools'; now they were very good people, with *too* much to eat & all the luxuries of life. Jemmy & his wife paddled away in their canoe loaded with presents & very happy. The most curious thing is





*Patagonians at Gregory Bay*

that Jemmy instead of recovering his own language has taught all his friends a little English: 'J. Button's canoe & Jemmy's wife come' – 'give me knife', was said by several of them.

We then bore away for this island – this little miserable seat of discord. We found that the Gauchos under pretence of a revolution had murdered & plundered all the Englishmen whom they could catch & some of their own countrymen. All the economy at home makes the foreign movements of England most contemptible: how different from old Spain. Here we dog-in the manger fashion seize an island & leave to protect it a Union Jack; the possessor has been of course murdered: we now send a Lieutenant with four sailors, without authority or instructions. A man of war, however, ventured to leave a party of marines, & by their assistance & the treachery of some of the party the murderers have all been taken – there being now as many prisoners as inhabitants. This island must some day become a very important halting place in the most turbulent sea in the world – it is mid way between Australia & South sea to England, between Chili, Peru &c & the R. Plata & R. de Janeiro. There are fine harbors, plenty of fresh water & good beef: it would doubtlessly produce the coarser vegetables. In other respects it is a wretched place: a little time since, I rode across the island & returned in four days: my excursion would have been longer but during the whole time it blew a gale of wind with hail & snow: there is no fire wood bigger



than Heath & the whole country is a more or less an elastic peat bog. Sleeping out at night was too miserable work to endure it for all the rocks in S. America.

We shall leave this scene of iniquity in two or three days & go to the Rio de la St Cruz: one of the objects is to look at the ship's bottom: we struck rather heavily on an unknown rock off Port Desire and some of her copper is torn off. After this is repaired the Captain has a glorious scheme; it is to go to the very head – that is probably to the Andes – of this river. It is quite unknown; the Indians tell us it is two or 3 hundred yards broad, & horses can nowhere ford it! I cannot imagine anything more interesting. Our plans then are to go to Port Famine, & there we meet the Adventure, who is employed in making the Chart of the Falklands. This will be in the middle of winter, so I shall see Tierra del [Fuego] in her white drapery. We leave the Straits to enter the Pacific by the Barbara channel, one very little known & which passes close to the foot of M. Sarmiento (the highest mountain in the South excepting M.!!Darwin!!). We then shall scud away for Concepcion in Chili. I believe the Ship must once again steer Southward, but if anyone catches me there again, I will give him leave to hang me up as scarecrow for all future naturalists. I long to be at work in the Cordilleras, the geology of this side, which I understand pretty well, is so intimately connected with periods of violence in that great chain of mountains. The future is indeed to me a brilliant prospect: you say its very brilliancy frightens you; but really I am very careful; I may mention as a proof, in all my rambles I have never had any one accident of scrape.

And now for some queries. Have you received a small square deal box with part of my Journal sent from the Plata in July 1833 (through Capt. Beaufort). Acknowledge it in more than one letter: recollect what a *bobbery* (a sea phrase) I made about the other parcel. I received a box with some delightful books & letter from Henslow: did Erasmus send it? There was not even a list of the books & I know not whom to thank. There is a Hon. Col. Walpole, consul-general at St Jago de Chili. Have I not heard of some such man at Walcot? What sort of person is he? I do not recollect anything more to say: not having any apologetical messages about money is nearly as odd a feature in my letters as it would have been in Dick Musgrove's. I am afraid it will be, till we cross the Pacific, a solitary exception. Remember me most affectionately to all the Owens. Tell dear Fanny I do not know how to thank her, at this distance, for remembering me. Continue in your good custom of writing plenty of gossip: I much like hearing all about all things. Remember me most kindly to Uncle Jos & to all the Wedgwoods. Tell Charlotte (their married names sound downright unnatural) I should like to have written to her to have told her how well everything is going on. But it would only have been a transcript of this letter & I have a host of animals at this minute surrounding me which all require embalming & numbering. I have not forgotten the comfort I received that day at Maer, when my mind was like a swinging pendulum. Give my best love to my Father. I hope he will forgive all my extravagance – but not as a Christian, for then I suppose he would send me no more Money. Good bye dear Katty to you & all yr goodly Sisterhood.

Your affectionate brother  
Chas Darwin.



My love to Nancy, tell her if she was now to see me with my great beard, she would think I was some worthy Solomon come to sell the trinkets.

Mrs Howtson, Camelford, Cornwall

I have enclosed a letter of my servant: will you pay the postage & forward it: by being my servant he loses the penny privilege & his friends cannot afford 3s. 6d.

*Letters* 1 pp. 251-4 [in part]; *Darwin and Beagle* pp. 96-100

On April 6th the *Beagle* left the Falkland Islands and returned to the coast of Patagonia.

On the 13th [April] we anchored in the Santa Cruz, and immediately prepared to lay our vessel ashore for a tide, to ascertain how much injury had been caused by the rock at Port Desire, and to examine the copper previous to her employment in the Pacific Ocean, where worms soon eat their way through unprotected planks. (16th.) When on the beach, at a place we afterwards called 'Keel Point', it was found that a piece of the false keel under the 'fore-foot', had been knocked off, and that a few sheets of copper were a good deal rubbed. By Mr May's exertions all was repaired in one tide; and the following day we were making preparations for an excursion up the river.

17th. An examination, or rather a partial exploring, of the River Santa Cruz had long been meditated. During the former voyage of the *Beagle*, Captain Stokes had ascended the rapid current as far as a heavy boat could be taken; but his account served only to stimulate our curiosity, and decided my following his example.

Three light boats were prepared (whale-boats strengthened); as much provision as they could stow with safety was put into them, and a party of officers and men selected. Lieut. Sullivan, having to take charge of the ship during our absence, could not go; neither could Mr Stewart, or Mr King, who were required to attend to duties on board; but Mr Darwin, Mr Chaffers, Mr Stokes, Mr Bynoe, Mr Mellersh, Mr Martens, and eighteen seamen and marines prepared to accompany me.

*Narrative* 2 pp. 336-7

18th. Early this morning we left the *Beagle*, and sailed up the estuary, into which the river flows, with a favouring wind and flood-tide.

In case any one should read these notes who has not visited the eastern coast of Patagonia, I will endeavour to describe the vicinity of the *Beagle's* anchorage in the Santa Cruz.

A wide, turbid, and very rapid river rushes through a confined opening into the ocean, during about seven hours, and is opposed and driven back by the flood-tide during other five hours of the twelve. On each side of the river are extensive – to the eye, boundless – plains of arid, desert land. But these plains are not on the same level. On the *northern* bank the land is but little higher than the level of high spring-tides; while on the southern side of the river, high perpendicular cliffs are strikingly contrasted. After ascending these heights by any of the ravines which





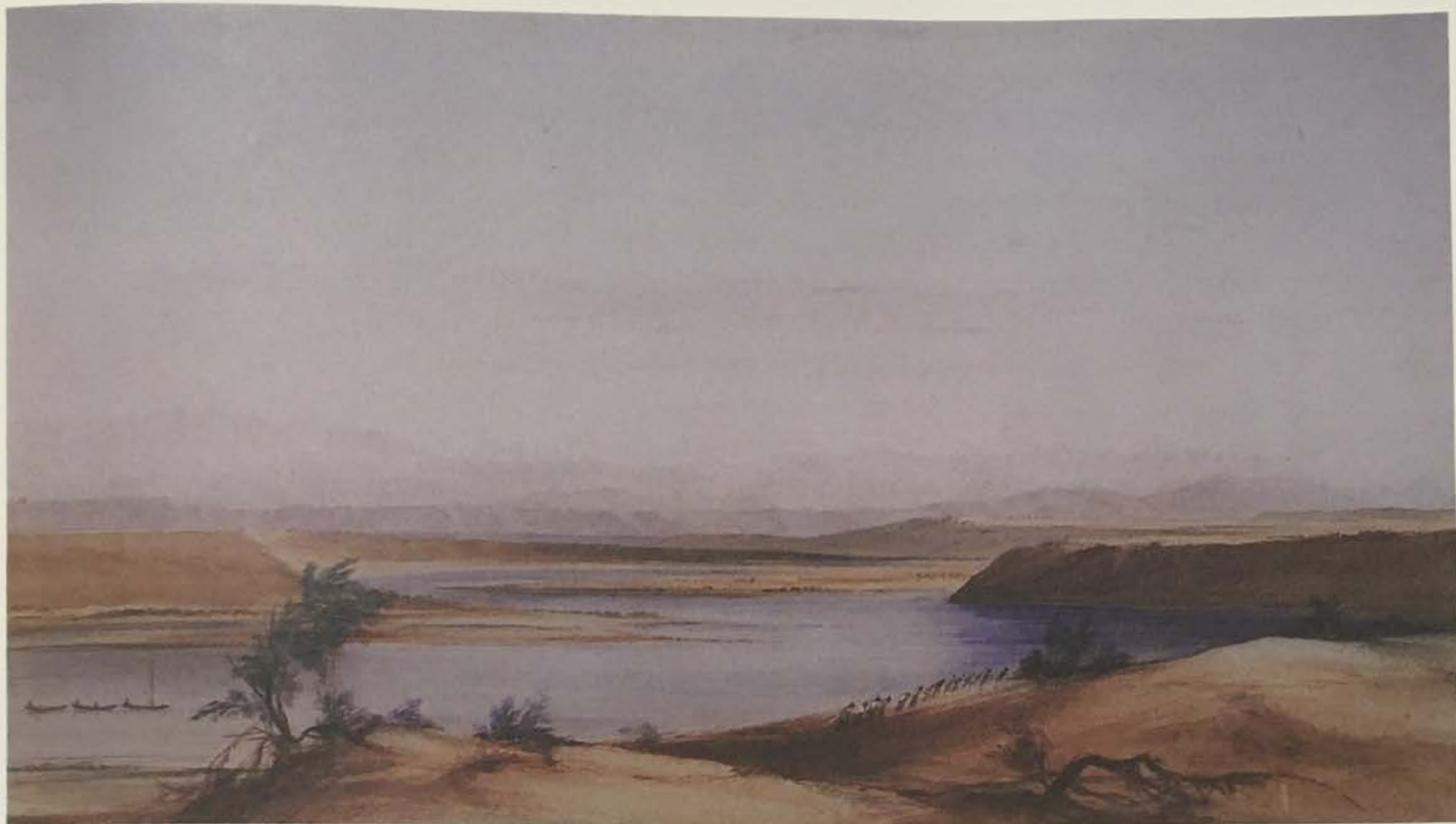
*Basalt Glen, Santa Cruz River*

intersect them, one finds a dead level expanse, similar in every respect to that on the northern shore. In the horizon, another 'steppe', or parallel plain, at a higher elevation, is seen.

Excepting in the Porphyry districts, all the *eastern* coasts of *Patagonia*, and the *little* of the interior which I have seen, appeared to me to be a similar succession of horizontal ranges, or level lands, of various heights, intersected here and there by ravines and water-courses. There are, certainly, hills in many places, which appear to the eye, passing at sea, or in the distance, conical, or, at all events, peaked; but even those hills are but the gable-ends, as it were, of narrow, horizontal ranges, or ridges of land, higher than the surrounding country.

Brownish-yellow is the prevailing colour, lighter or darker, as the sun shines or is obscured. Here and there, in hollow places or ravines, a few dark-looking shrubby bushes are seen; but over the wide desolation of the stony, barren plain, not a tree can be discerned. Scattered herds of ever-wary guanacoes, startled at your approach, neighing, stamping, and tossing their elegant heads; a few ostriches, striding along in the distant horizon; and here and there a solitary condor, soaring in the sky, are the only objects which attract the eye. Certainly, if one looks *closely*, some withered shrubs, and a yellow kind of herbage, may be discerned; and, in walking, thorns and prickles assure one, painfully, that the plain is *not*, in truth, a *desert*: but I am quite sure that the general impression upon the mind is that of utter, hopeless sterility.





*River Santa Cruz*

Is it not extraordinary, that sea-worn, *rolled*, shingle-stones, and alluvial accumulations, compose the greater portion of these plains? How vast, and of what immense *duration*, must have been the action of those waters which smoothed the shingle-stones now buried in the deserts of Patagonia!

*Fresh* water is seldom found in these wastes; salinas (salt depositions or incrustations) are numerous. The climate is delightful to the bodily sensations; but for productions of the earth, as bad as any, excepting that of the Arabian or African desert. Rain is seldom known during three-quarters of the year, and even in the three winter months, when it may be expected, but little falls except on *rare* occasions, when it rains for two or three days in succession. Sea-winds sometimes bring small, misty rain for a few hours, but not enough to do good to vegetable produce.

The only animals which abound are guanacoes, and *they* have *often* been seen drinking salt water. The puma quenches its thirst in *their* blood. Of other animals supposed to require much liquid sustenance, there are none in these regions.

Generally, a bright sunny day is succeeded by a cloudless and extremely clear night. In summer the heat is scorching, not sultry. In winter the weather is sometimes searchingly cold, especially during southerly winds. Changes of wind are sudden, and cause extreme variations of temperature. Sometimes the sky is slightly or partially overcast, occasionally clouded heavily, but on most days a bright sunshine, and a fresh, or strong westerly wind, may be expected.

The confluence of a large and continual torrent of fresh water and the great



tides of the ocean, which here rise forty feet perpendicularly, has embarrassed the mouth of the Santa Cruz with a number of banks. They are all composed of shingle and mud, and alter their forms and positions as affected by river floods, or by the heavy seas caused by south-east gales.

Into the entrance of the Santa Cruz the flood-tide sets about four knots an hour, or, it may be said, from two to five knots, according to the time of tide, and the narrower or broader part of the opening. Outwards, the water rushes, at least, six knots, on an average, in the mid-channel. In places, and at times, when acted upon by wind or unusual floods, it does not run with a velocity less than seven or eight knots an hour, perhaps even more. (I am speaking of the mid-channel, or fair-way.) Near either shore, and in the bights between projecting points, of course the strength of the outward as well as inward current is very inferior.

In such a bight, close to the high cliffs on the southern shore, the Beagle was moored. One may readily conceive the different views presented in this situation, with forty feet change in the level of the water. At high-water, a noble river, unimpeded, moves quietly, or is scarcely in motion. At the other time, a rushing torrent struggles between numerous banks, whose dark colour and dismal appearance adds to the effect of the turbidly yellow water, and naked-looking, black, and muddy shores.

[from FitzRoy's diary, as it appeared in the *Journal of the Royal Geographical Society of London* in 1837]

APRIL 20th. As we were going along the bank of the river, which to our great benefit was becoming more accessible and clearer of bushes, we saw some dark coloured animals crossing the stream at a distance, but no one could guess what they were until the foremost of them reached the shore, and rising upon his stilt-like legs, showed himself to be an ostrich. Six or seven of these birds were swimming across: till then I had no idea that so long-legged a bird, not web-footed, would, of its own accord, take to the water and cross a rapid stream: this, however, was a certain proof to the contrary, for nothing had disturbed them that we could discern. As far as we could tell, at so great a distance, they seemed to be of the kind which the Spanish-patagonians call 'Avestruz-petis'. They were, however, far too wild to be approached with a gun. We saw smoke at a distance and anticipated meeting Indians, in the course of our next day's journey. The country around continued similar to that already described: but islands no longer impeded our progress, though some high cliffy banks gave us trouble. At the next place where we passed a night, Mr Darwin tried to catch fish with a casting net, but without success; so strong a stream being much against successful fishing. A very sharp frost again this night. The net and other things, which had occupied but little room in the boat, were frozen so hard as to become unmanageable and very difficult to stow.



APRIL 22nd. The country remains the same, & terribly uninteresting. The great similarity in production is a very striking feature in all Patagonia; the level plains of arid shingle support the same stunted & dwarf plants; in the valleys the same thorn-bearing bushes grow, & everywhere we see the same birds & insects. Ostriches are not uncommon, but wild in the extreme. The Guanaco, however, is in his proper district, the country swarms with them; there were many herds of 50 to 100, & I saw one with I should think 500. The Puma or Lion & the Condor follow & prey upon these animals. The footsteps of the former might almost everywhere be seen on the banks of the river. The remains of several Guanaco with their necks dislocated & bones broken & gnawed, showed how they met their death. Even the very banks of the river & of the clear little streamlets which enter it, are scarcely enlivened by a brighter tint of green. The curse of sterility is on the land. The very waters running over the bed of pebbles are stocked with no fish. Hence there are no water-fowl, with the exception of some few geese or ducks.

*Diary p.223*

APRIL 25th & 26th. This day I found for the first time, some interesting work. The plains here are capped by a field of Lava, which at some remote period when these plains formed the bottom of an ocean, was poured forth from the Andes. This field of Lava is on a grand scale; further up the river it is more than 300 feet thick, & the distance from its source is great. The most Southern Volcanic rocks in the Andes hitherto known, are many hundred miles to the North, not far from the island of Chiloe. The Lava caused many small springs. The valleys here were greener & I recognised many plants of Tierra del Fuego. The Guanaco was in his element amongst the rugged low proecipices. It is curious how in many cases the scenery is totally dependent on the geology; some of the valleys so precisely resembled those at St Jago, that if I could have added the warmth of a tropical day I should have looked about me to recognise old frequented spots.

*Diary p.224*

On this day (25th) our best shots succeeded in killing two guanacoes, but they died out of our reach, and probably became food for pumas, instead of man. The order of our march was usually one or two riflemen in advance, as scouts – Mr Darwin, and occasionally Mr Stokes, or Mr Bynoe, upon the heights – a party walking along the banks, near the boats, ready to relieve or assist in tracking, and the eight or ten men who were dragging the three boats along at the rate of about two miles an hour over the ground, though full eight knots through the water. Difficult places to pass – delays caused by embarking and disembarking frequently to change banks, and avoid impediments – the necessary observations, rest, and meals, occupied so much time that we did not average more than twelve miles in one day: and even that small distance was not accomplished without making both shoulders and feet sore.

26th. In the distance some very level topped, dark looking cliffs, were seen at



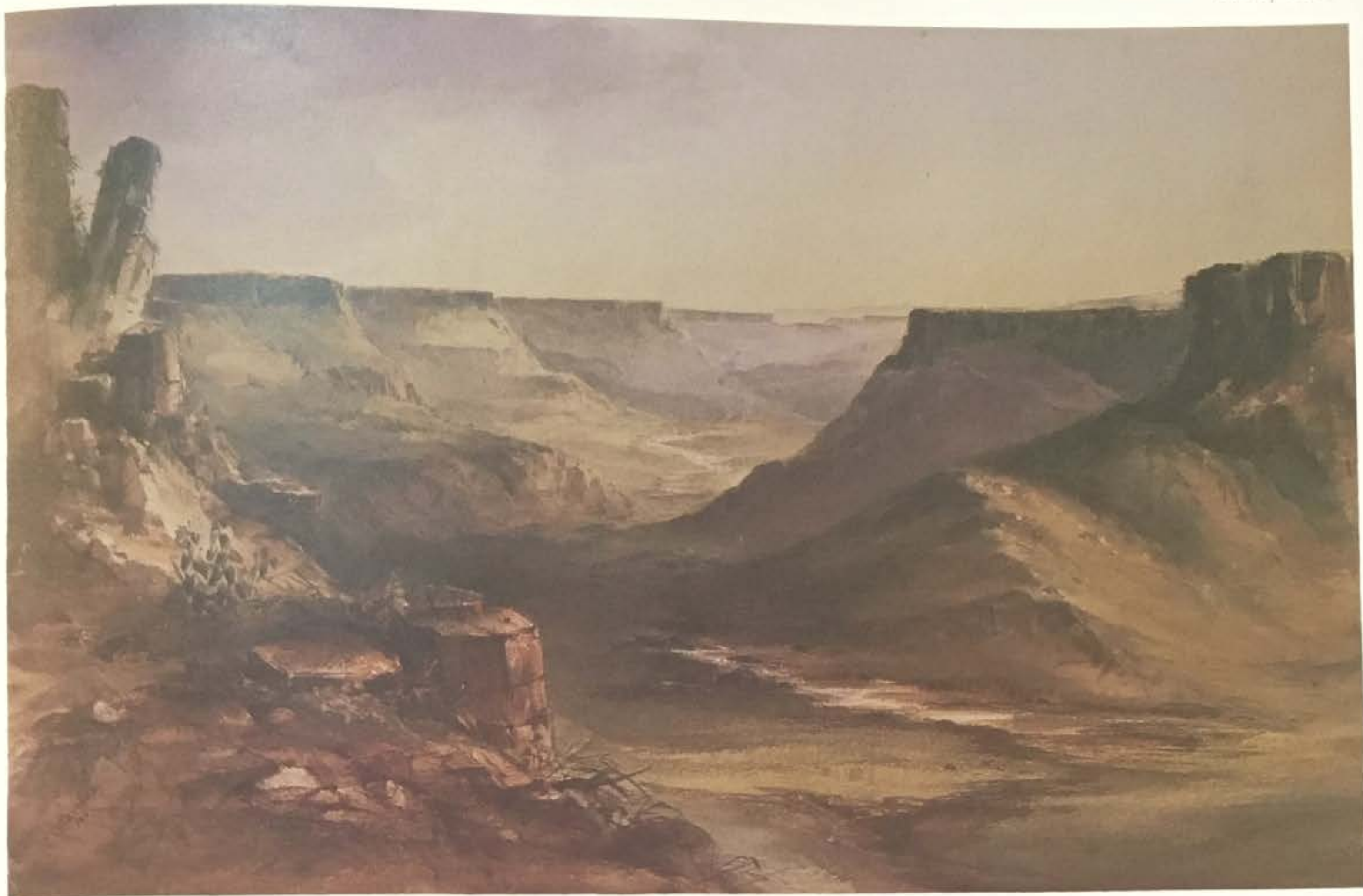


*Basalt Glen, Santa Cruz River*

the summits of elevated ranges, which Mr Darwin thought must have a capping or coating of lava. Of course we were very anxious to verify a fact so curious, and at noon were quite satisfied that it was so, having approached to the foot of a height thus capped, whose fragments had in falling not only scattered themselves over the adjacent plain, but into the bed of the river, in such a manner as to make the passage exceedingly dangerous; because large angular masses, in some places showing above the stream in others hidden beneath, but so near the surface that the water eddied and swelled over them, menaced destruction to the boats as they were with difficulty dragged through the eddying rapid; sometimes the rope caught under or around one of those masses, and caused much trouble. Near the spot where we stopped at noon there is a glen, quite different in character from any place we had passed. Indeed, upon entering the lava district, or that part of the country over which lava formerly flowed, there was no longer a Patagonian aspect around. Steep precipices, narrow, winding vallies, abundance of huge angular fragments of lava, a more rapid and narrower river, and plains of solid lava overlying the whole surface of the country, make this district even worse in its appearance than the eastern coast of Patagonia. Excepting in an occasional ravine nothing grows. Horses could not travel far, the ground being like rough iron; and water, excepting that of the river and its tributary in Basalt Glen, is very scarce.

The glen above mentioned is a wild looking ravine, bounded by black lava





*Basalt Glen, Santa Cruz River*

cliffs. A stream of excellent water winds through it amongst the long grass, and a kind of jungle at the bottom. Lions or rather pumas shelter in it, as the recently torn remains of guanacoës showed us. Condors inhabit the basaltic cliffs. Near the river some imperfect columns of basalt give to a remarkable rocky height, the semblance of an old castle. Altogether it is a scene of wild loneliness quite fit to be the breeding place of lions.

*Narrative* 2 pp.347-8

APRIL 27th. The bed of the river became rather narrower, and hence the stream more rapid. It here ran at the rate of six knots an hour. From this cause, and from the many great angular fragments, tracking the boats became both dangerous and laborious.

This day I shot a condor. It measured from tip to tip of the wings, eight and a half feet, and from beak to tail, four feet. It is a magnificent spectacle to behold several of these great birds seated on the edge of some steep precipice. I will here describe all I have observed respecting their habits. The condor is known to have a wide geographical range, being found on the west coast of South America, from the Strait of Magellan throughout the entire range of the Cordillera. On the Patagonian shore, the steep cliff near the mouth of the Rio Negro in lat.  $41^{\circ}$ , was



the most northern point where I saw these birds, or heard of their existence. They have there wandered about four hundred miles from the great central line of the habitation in the Andes. Further south, among the bold precipices which form the head of Port Desire, they are not uncommon; yet only a few stragglers occasionally visit the sea-coast. A line of cliff near the mouth of St. Cruz, is frequented by these birds, and about eighty miles up the river, where first the sides of the valley were formed by steep basaltic precipices, the condor again appeared, although in the intermediate space not one had been seen. From these and similar facts, the presence of this bird seems chiefly to be determined by the occurrence of perpendicular cliffs. In Patagonia, the condors either by pairs or many together, both sleep and breed on the same overhanging ledges. In Chile, during the greater part of the year, they haunt the lower country near the shores of the Pacific, and at night several roost in one tree; but in the early part of summer, they retire to the most inaccessible parts of the inner Cordillera, there to breed in peace.

With respect to their propagation, I was told by the country people in Chile, that the condor makes no sort of nest, but in the months of November and December lays two large white eggs on a shelf of bare rock. On the Patagonian coast I could not see any sort of nest among the cliffs, where the young ones were standing. It is said the young condors cannot fly for an entire year. At Concepcion, on the fifth of March (corresponding to our September), I saw a young bird, which, though in size little inferior to an old one, was completely covered by down like that of a gosling, but of a blackish colour. I feel sure this bird could not have used its wings for flight for many months. After the period when the young condors can fly, and apparently as well as the old birds, they yet remain both roosting at night on the same ledge, and hunting by day with their parents. Before, however, the young bird has the ruff round its neck turned white, it may often be seen hunting by itself. At the mouth of the St. Cruz, during part of April and May, a pair of old birds might be seen every day either perched on a certain ledge, or sailing about in company with a single young one, which latter though full fledged, had not its ruff white. I should think, especially when recollecting the state in which the Concepcion bird was on the previous month, that this young condor had not been hatched from an egg of that summer. As there were no other young birds, it seems probable that the condor only lays once in two years.

These birds generally live by pairs; but among the inland basaltic cliffs of the St. Cruz, I found a spot, where scores most usually haunt. On coming suddenly to the brow of the precipice, it was a fine sight to see between twenty and thirty of these great birds start heavily from their resting-place, and wheel away in majestic circles. From the quantity of dung on the rocks, they must long have frequented this cliff, and probably they both roost and breed there. Having gorged themselves with carrion on the plains below, they retire to these favourite ledges, to digest their food. From these facts, the condor must to a certain degree, like the gallinazo, be considered a gregarious bird. In this part of the country they live altogether on the guanacoes, which either have died a natural death, or, as more commonly happens, have been killed by the pumas. I believe, from what I saw in





*Santa Cruz River*

Patagonia, that they do not on ordinary occasions extend their daily excursions to any great distance from their regular sleeping-places.

The condors may oftentimes be seen at a great height, soaring over a certain spot in the most graceful spires and circles. On some occasions I am sure that they do this for sport, but on others, the Chileno countrymen tell you that they are watching a dying animal, or the puma devouring its prey. If the condors glide down, and then suddenly all rise together, the Chileno knows that it is the puma which, watching the carcass, has sprung out to drive away the robbers. Besides feeding on carrion, the condors will frequently attack young goats and lambs. Hence the shepherd dogs are trained, the moment the enemy passes over, to run out, and looking upwards, to bark violently. The Chilenos destroy and catch numbers. Two methods are used; one is to place a carcass within an enclosure of sticks on a level piece of ground, and when the condors are gorged, to gallop up on horseback to the entrance, and thus enclose them: for when this bird has not space to run, it cannot give its body sufficient momentum to rise from the ground. The second method is to mark the trees in which, frequently to the number of five or six, they roost together, and then at night to climb up and noose them. They are such heavy sleepers, as I have myself witnessed, that this is not a difficult task. At Valparaiso, I have seen a living condor sold for sixpence, but the common price is eight or ten shillings. One which I saw brought in, had been lashed with rope, and was much injured; yet, the moment the line was cut by which its bill was secured,





*Condors preying on a dead guanaco*

although surrounded by people, it began ravenously to tear a piece of carrion. In a garden at the same place, between twenty and thirty were kept alive. They were fed only once a week, but they appeared in pretty good health. The Chileno countrymen assert that the condor will live and retain its powers, between five and six weeks without eating. I cannot answer for the truth of this, but it is a cruel experiment, which very likely has been tried.

When an animal is killed in the country, it is well known that the condors, like other carrion vultures, soon gain intelligence of it, and congregate in an inexplicable manner. In most cases it must not be overlooked, that the birds have discovered their prey, and have picked the skeleton clean, before the flesh is in the least tainted. Remembering the opinions of M. Audubon, on the little smelling powers of such birds, I tried in the above-mentioned garden the following experiment: The condors were tied, each by a rope, in a long row at the bottom of a wall. Having folded up a piece of meat in white paper, I walked backwards and forwards, carrying it in my hand at the distance of about three yards, but no notice whatever was taken. I then threw it on the ground, within one yard of an old cock bird; he looked at it for a moment with attention, but then regarded it no more. With a stick I pushed it closer and closer, until at last he touched it with his beak; the paper was then instantly torn off with fury, and at the same moment, every



bird in the long row began struggling and flapping its wings. Under the same circumstances, it would not have been possible to have deceived a dog.

I may remark, that oftentimes when lying down to rest on the open plains, and on looking upwards, I have seen carrion hawks, sailing through the air at a great height. Where the country is level I do not believe a space of the heavens, of more than  $15^{\circ}$  above the horizon, is commonly viewed with any attention by a person either walking or on horseback. If such is the case, and the vulture is on the wing at a height of between three and four thousand feet, before it could come within the above range of vision, its distance in a straight line from the beholder's eye, would be rather more than two British miles. Might it not thus readily be overlooked? When an animal is killed by the sportsman in a lonely valley, may he not all the while be watched from above by the sharp-sighted bird? And will not the manner of its descent proclaim throughout the district to the whole family of carrion-feeders, that their prey is at hand?

When the condors in a flock are wheeling round and round any spot, their flight is beautiful. Except when rising from the ground, I do not recollect ever having seen one of these birds flap its wings. Near Lima, I watched several for nearly half an hour, without once taking off my eyes. They moved in large curves, sweeping in circles, descending and ascending without once flapping. As they glided close over my head, I intently watched, from an oblique position, the outlines of the separate and terminal feathers of the wing, if there had been the least vibratory movement, these would have been blended together, but they were seen distinct against the blue sky. The head and neck were moved frequently, and apparently with force, and it appeared as if the extended wings formed the fulcrum on which the movements of the neck, body, and tail, acted. If the bird wished to descend, the wings were for a moment collapsed; and then when again expanded with an altered inclination, the momentum gained by the rapid descent seemed to urge the bird upwards, with the even and steady movement of a paper kite. In the case of any bird *soaring*, its motion must be sufficiently rapid, so that the action of the inclined surface of its body on the atmosphere, may counterbalance its gravity. The force to keep up the momentum of a body moving in a horizontal plane in that fluid (in which there is so little friction) cannot be great, and this force is all that is wanted. The movement of the neck and body of the condor, we must suppose, is sufficient for this. However this may be, it is truly wonderful and beautiful to see so great a bird, hour after hour, without any apparent exertion, wheeling and gliding over mountain and river.

APRIL 29th. From some high land we hailed with joy the white summits of the Cordillera, as they were seen occasionally peeping through their dusky envelope of clouds. During the few succeeding days, we continued to get on slowly, for we found the river-course very tortuous, and strewn with immense fragments of various ancient slaty rocks, and of granite. The plain bordering the valley had here attained an elevation of about 1100 feet, and its character was much altered. The well-rounded pebbles of porphyry were in this part mingled with many immense angular fragments of basalt and of the rocks above mentioned. The first of these erratic blocks which I noticed, was sixty-seven miles distant from the



nearest mountain; another which had been transported to rather a less distance, measured five yards square, and projected five feet above the gravel. Its edges were so angular, and its size so great, that I at first mistook it for a rock *in situ*, and took out my compass to observe the direction of its cleavage. The plains here were not quite so level as those nearer the coast, but yet, they betrayed little signs of any violent action. Under these circumstances, it would be difficult, as it appears to me, to explain this phenomenon on any theory, excepting through that of transport by ice while the country was under water. But this is a subject to which I shall again recur.

*Narrative* 3 pp.219-24

APRIL 29th. While upon a high range of lava-capped land, Mr Stokes and Mr Darwin descried distant mountains in the west, covered with snow. At last, then, the Andes were in sight! This was inspiring intelligence to the whole party; for small had been our daily progress, though continual and severe the labour. The river increased in rapidity, while but little diminution had taken place in the quantity of water brought down: the breadth was rather less, certainly, but the depth in most places greater. No fish had yet been caught; indeed, only two had been seen, and those seemed to be like trout.

30th. The snowy summits of the distant Cordillera were more distinctly seen from the heights, near the river, that rise about a thousand feet above its level, which, there, is about three hundred feet above that of the sea. Two guanacoës were shot with my rifle by H. Fuller, who hastened to the boats for assistance. Some of our party went directly with him to bring in the animals, but condors and cara-caras had eaten every morsel of the flesh of one; though the other was found untouched and brought to the boats. Four hours had sufficed to the cara-caras and condors for the cleaning of every bone. When our party reached the spot some of those great birds were so heavily laden that they could hardly hop away from the place. The guanaco that was eaten by the birds must have been, by his size, at least fifty pounds heavier than any shot by us in Patagonia, therefore about 300lbs. Mr Darwin and Mr Stokes had much amusement with these animals, upon the heights. Being so much tamer there and more numerous, whole flocks were driven by them into narrow defiles, where dozens might have been killed had there been more people with guns, lassoes, or balls.

Though the bed of the river is there so much below the level of the stratum of lava, it still bears the appearance of having worn away its channel, by the continual action of running water. The surface of the lava may be considered as the natural level of the country, since, when upon it, a plain, which seems to the eye horizontal, extends in every direction. How wonderful must that immense volcanic action have been which spread liquid lava over the surface of such a vast tract of country. Did the lava flow from the Cordillera of the Andes, or was it thrown out from craters in the low country? Its position with respect to subaqueous deposits, its horizontal surface and cellular texture, are reasons,



among others, for thinking that it was thrown out of the earth, while these plains were covered by a depth of sea.

*Narrative* 2 pp. 349-50

On the 3d [May], we found a more open country, the lava-capped heights receding gradually on each side, leaving a vale of flat, and apparently good land, from five to fifteen miles in extent. The width of the river increased; on its banks were swampy spaces, covered with herbage; and low earthy cliffs, without either shingle or lava, in some places bounded the river. A little further, however, the usual arid and stony plains of Patagonia were again seen, extending from the banks of the river to ranges of hills, about fourteen hundred feet above its level, on which the horizontal lava-capping could be distinctly discerned.

In the distant west the Cordillera of the Andes stretched along the horizon. During three days, we had advanced towards those far distant mountains, seeing them at times very distinctly; yet this morning our distance seemed nearly as great as on the day we first saw their snow-covered summits. A long day's work carried us beyond the flat and into the rising country, whose barren appearance I just now mentioned. We were all very tired of the monotonous scene, as well as of the labour of hauling the boats along.

4th. Our provisions being almost exhausted, and the river as large as it was beyond the lava country, our allotted time being out, and every one weary and foot-sore, I decided upon walking overland to the westward, as far as we could go in one day, and then setting out on our return to the Beagle. I was the more inclined to this step, because the river here made a southerly bend, to follow which would have required at least a day, without making much westing, and because I thought that some of our party might walk in that time at least twice as far as they could track the boats, and then return before night. To have followed the course of the river two days longer, we should have needed all the small remainder of our provisions, and probably without being enabled to see further than we might by one day's walk directly westward. Leaving those who were the most tired to take care of the boats, a party set out early, in light marching order. A large plain lay before us, over which shrubs, very small trees, and bushes were sparingly scattered; yet parts of this plain might be called fertile and woody, by comparison with the tracts between us and the eastern sea-coast.

*Narrative* 2 pp. 351-2

Late on the 4th [May] we returned to our tents, thoroughly tired by a daily succession of hard work, and long walks. At this bivouac we were about one hundred and forty miles, in a straight line, from the estuary of Santa Cruz, or from Weddell Bluff; and about two hundred and forty-five miles distant by the course of the river. Our station at noon on the 4th, was eight miles in a straight line farther westward, and about thirty miles from the Cordillera of the Andes. The height of those mountains was from five to seven thousand feet above our level, by angular measurement with a theodolite. Early on the 5th we began the rapid



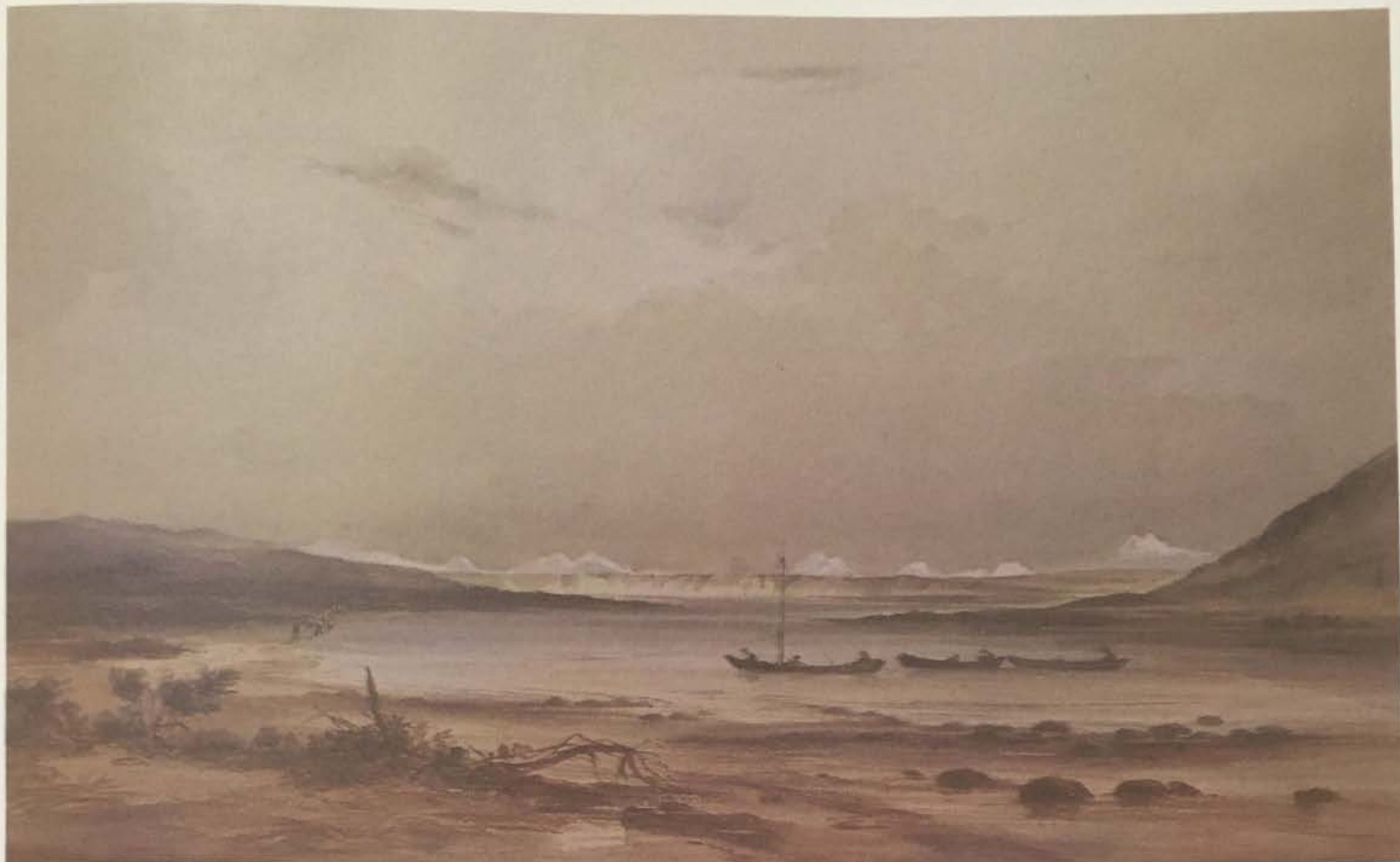


*Shooting guanacos*

descent. Sometimes the wind favoured, and we passed the land at the rate of ten knots an hour; sometimes dangerous places obliged us to turn the boat's head to the stream, pull against it, and so drop down between the rocks. Though easy, the return was far more dangerous than our ascent of the river.

5th. Our first day's work in returning was a distance of eighty-five miles, which had cost us six days hard labour in ascending. Next day we made good about eighty-two miles; and on the 7th we reached the salt water. Although we made such quick progress in returning, our halts for observations were similar to those made in going. While descending the rapid stream, so quickly and quietly, we saw many more guanacoës and ostriches than we had seen before; but our flying shots only frightened them, and time was too precious to admit of any delay. Only one fish was got, and that was a dead one, which had been left on the bank: it was similar to a trout. Not more than half a dozen live fish were seen, and none could be caught either with hooks or nets. Leaving a very small party near Weddell Bluff to look for guanacoës, I hastened on board with the boats; and with the ebb tide reached the Beagle before noon on the 8th. The ship being ready for sea, excepting a ton or two of fresh water, the yawl and cutter were dispatched to get it and bring on board the shooting party. During my absence satisfactory observations on the tides had been made, which showed that the neap tides rise about eighteen feet, and the springs from thirty-eight to forty-two feet. One day





*Cordillera seen from Santa Cruz River*

when walking through a woody ravine, not far from the anchorage, Mr Stewart saw a puma lying under a bush, glaring at him: taking a steady aim, he fired, and laid the animal dead. It was a very large one; and the skin is now in the British Museum. The moment of thus looking a lion in the face, while taking aim, at only a few yards distance, must be somewhat trying to the nerves, I should imagine. A beautiful wild cat was also added to our collections, besides condors and foxes.

*Narrative* 2 pp.356-7

On May 12th the *Beagle* sailed southwards, and the next three weeks were spent taking soundings and surveying the coast on either side of the eastern entrance to the Strait of Magellan, assisted after May 23rd by the *Adventure*. On June 3rd both ships were moored in Port Famine, preparing for their passage into the Pacific by an unconventional route through the Magdalen and Cockburn Channels, which FitzRoy preferred to the normal one through the western part of the Strait of Magellan.

JUNE 9th. Good equal altitudes having been obtained, after an interval of time sufficient for rating our chronometers, we sailed from Port Famine, went down the Magdalen Channel, enjoying some fine scenery, among which Sarmiento was pre-eminent, and anchored in a cove under Cape Turn. The following day we beat to windward through the Cockburn Channel, and would have anchored at night





*Chiloe*

had a safe place offered in time, but as the only cove near us at dusk was a very small one, I preferred leaving that unoccupied for the *Adventure*, and remaining under way in the *Beagle*. The night was long and very dark, small rain fell nearly all the time, and squalls from the westward were frequent. There were but four square miles in which it was safe to sail to and fro after dark, and for fourteen hours we traversed that area in every direction. It was necessary to keep under a reasonable press of sail part of the time, to hold our ground against the lee tide; but with the ebb we had often to bear up and run to leeward, when we got too near the islets westward of us. In a case of this kind a ship is so much more manageable while going through the water than she is while hove-to, and those on board are in general so much more on the alert than when the vessel herself seems half asleep, that I have always been an advocate for short tacks under manageable sail, so as to keep as much as possible near the same place, in preference to heaving-to and drifting.

When the day at last broke on the 11th, we saw the *Adventure* coming out to us from the cove where she had passed the night, and then both vessels sailed out of the Channel, past Mount Skyring and all the Furies, as fast as sails could urge them. At sunset we were near the Tower Rocks, and with a fresh north-west wind stood out into the Pacific, with every inch of canvas set which we could carry.





*Breast ploughing at Chiloe*

Bad weather compelled the *Beagle* to spend a fortnight at San Carlos (now known as Ancud), a port at the northernmost end of Chiloe.

JUNE 30th – JULY 8th. I staid in the town of S. Carlos three days; during the greater part of this time the weather was very fine; the inhabitants themselves wondering at such an event. I do not suppose any part of the world is so rainy as the island of Chiloe. The Cordilleras are very rarely in sight; one morning before sunrise we had a very fine view of the Volcano of Osorno; it stood out in dark relief. It was curious to see as the sun rose, the outline gradually lost in the glare of the Eastern sky. During the fine weather I enjoyed some very pleasant walks about the town & examined the structure of the rocks. This island, like the plains of Patagonia, is only an appendage to the Andes; it is formed of the debris of its rocks & of streams of lava. These submarine beds have been elevated into dry land only in a very recent period. The soil resulting from the decomposition of these rocks is very fertile; but agriculture is as yet in its rudest forms; to this the structure of the mills & boats & their method of spinning quite correspond. The inhabitants, judging from their complexions & low stature, have three-fourths of Fuegian or Boat Indian blood in their veins; they are all dressed in coarse strong woollen garments, which each family makes for themselves & dyes with Indigo of a dark blue color.





*Port Famine*

Although with plenty to eat, they are excessively poor; there is little demand for labor, & from the scarcity of money nearly all payments are made with goods. Men carry on their backs from long distances, bags of charcoal, (the only fuel used in the town) to obtain the most trifling luxuries. The joy which the sight of a few Reals gave to these poor men was quite surprising; after making them a present, they always insisted on having your hand to shake it as a sign of their gratitude. One day I walked a few miles on the road to Castro. This place was the former capital & is now the second town in the island. The road is the only one which goes directly through the interior of the country. About two miles from S. Carlos it enters the forest, which covers the whole country & has only been rendered passable by the aid of the axe. For its whole length there are not more than two or three houses; the road itself was made in the time of the old Spaniards & is entirely formed of trunks of trees squared & placed side by side. From the gloomy damp nature of the climate, the wood had a dreary aspect; in the Tropics such a scene is *delightful* from the contrast it affords with the brilliancy & glare of every open spot. The country generally is only inhabited round the shores of the creeks





& Bays, & in this respect it resembles T. del Fuego. The road by the coast is in some places so bad that many houses have scarcely any communication with others excepting by boats.

The capital itself is worthy of the island, it is a small straggling dirty village; the houses are singular from being entirely built – sides, roofs, partitions &c. – of plank. The Alerce or cedar from which these planks are made grows on the sides of the Andes; they possess the curious property of splitting so evenly that by planing the planks are nearly as well formed as if sawed. These planks are the staple export of the Islands, to which may be added potatoes & hams.

*Diary pp. 232-3*

C.D. TO MISS CATHERINE DARWIN

Sunday July 20th 1834 – a hundred miles South of Valparaiso

My dear Catherine,

Being at sea & the weather fine, I will begin a letter which shall be finished when we arrive in Port. I have received the whole series of letters up to yours of



November 1833. I wrote last from the Falkland Isds (where the Conway left for us a letter Bag); in this I mention receiving a Box, which must have come from Henslow: The next Man of War that comes round the Horn will bring the one from you.

We left the Island of Chiloe a week since, for which place a succession of gales compelled us to bear up. We staid there some days in order to refresh the men. Pigs & potatoes are as plentiful as in Ireland. With the exception of this weighty advantage, Chiloe from its climate is a miserable hole. I forget whether you were at home when my friend Mr Proctor was there & told us about the place where his Uncle says it never ceases to rain; I am sure he must have meant Chiloe.

Altogether the last six months since leaving the Plata has been a most prosperous cruize. Much as I detest the Southern Latitudes, I have been enabled during this period to do so much in Geology & Natural History that I look back to Tierra del Fuego with grateful & almost kindly feelings. You ask me about the specimens which I send to Cambridge. I collect every living creature which I have time to catch & preserve; also some plants. Amongst Animals, on principle I have lately determined to work chiefly amongst the Zoophytes or Coralls; it is an enormous branch of the organized world, very little known or arranged & abounding with most curious, yet simple forms of structures.

But to go on with our history; when I wrote from the Falklands we were on the point of sailing for the S. Cruz on the coast of Patagonia. We there looked at Beagle's bottom; her false keel was found knocked off, but otherwise not damaged. When this was done, the Captain & 25 hands in three boats proceeded to follow up the course of the river of S. Cruz. The expedition lasted three weeks; from want of provisions we failed reaching as far as was expected, but we were within 20 miles of [the] great snowy range of the Cordilleras: a view which has never before been seen by Europæan eyes. The river is a fine large body of water; it traverses wild desolate plains inhabited by scarcely anything but the Guanaco. We saw in one place smoke & tracks of the horses of a party of Indians: I am sorry we did not see them, they would have been out & out wild Gentlemen.

In June, in the depth of winter, we beat through the Straits of Magellan; the great chain of mountains in which M Sarmiento stands presented a sublime spectacle of enormous piles of snow. Scenery however is not sufficient to make a man relish such a climate. We passed out by the Magdalen channel, an unfrequented & little known exit; on our passage up, before we were driven into Chiloe, Mr Rowlett, the purser, died; having gradually sunk under a complication of diseases.

So much for the past; our future plans are as yet very uncertain: after Valparaiso, we will go to Coquimbo to refit. Here the climate is fine, but everything else bad; the desert of Peru may be said to extend so far South; where man-kind is only enticed to live by the richer metals. Next summer there is a good deal of work to be done behind & around Chiloe; how far I shall accompany the vessels I do not yet know.

Amongst all the things you & Susan have told me in the last letters, you do not even mention Erasmus; I hope the good lazy old gentleman is alive; tell him I



should like very much to have one more letter from him; perhaps the box will bring one: if he would write to me four letters during the whole voyage, I would not grumble at all. As for all of you, you are the best correspondents a brother, 3000 miles off, ever had. I wish you could inspire Erasmus with a little of the superabundance of your virtues. I am afraid he thinks your stock is sufficient for the whole family. I am much pleased to hear my Father likes my journal: as is easy to be seen, I have taken too little pains with it. My geological notes & descriptions of animals I treat with far more attention: from knowing so little of Natural History, when I left England, I am constantly in doubt whether these will have any value. I have however found the geology of these countries so different from what I read about Europe, & in consequence when compared with it so instructive to myself, that I cannot help hoping that even imperfect descriptions may be of some general utility. Of one thing I am sure, that such pursuits are sources of the very highest pleasures I am capable of enjoying. Tell my Father also, how much obliged I am for the affectionate way he speaks about my having a servant. It has made a great difference in my comfort; there is a standing order, in the Ship, that no one, excepting in civilized ports, leaves the vessel by himself. By thus having a constant companion I am rendered much more independent, in that most dependent of all lives; a life on board ship. My servant is an odd sort of person; I do not very much like him; but he is, perhaps from his very oddity, very well adapted to all my purposes.

July 29th, Valparaiso. I have again to thank you all for being such good sisters as you are. I have just received 3 letters, one from each of you, in due order the last being from Susan, Feb 12th. Also the box of books, with sundry notes & letters. I am much obliged for your chain, I wear Caroline's pencil case suspended by it round my neck. Thank Granny for her purses & [5 lines erased]. The little political books are very popular on board; I have not had time yet to read any of them. Everything came right in the box; the shoes are invaluable; tell Erasmus he is a very good old gentleman for doing all my commissions, but he would be still better if he would write once again – four letters are too much – it will frighten him, so I will change my demand to two & they may be as short as he likes, so that they really come from him. One other message & I have done – it is to my Father that I have drawn a bill of eighty pounds. I must now hold out as the only economical prospect the time when we cross the South Sea. I hope this will not be considered as a little 'South Sea scheme'.

Valparaiso is a sort of London or Paris, to any place we have been to – it is most disagreeable to be obliged to shave & dress decently. We shall stay here two months, instead of going North-ward, during which time the ship will be refitted & all hands refreshed. You cannot imagine how delightful the climate feels to all of us, so dry, warm & cheerful: it is not here as in T. del Fuego where one fine day makes one fear the next will be twice as bad as usual. The scenery wears such a different aspect, I can sit on the hills & watch the setting sun brighten the Andes, as at Barmouth we used to look at Cader-Idris. The time of year being now winter is very unfortunate for me; it is quite hopeless to penetrate the Cordilleras. There is a mountain, near here, at Quillota, 4700 feet high. I am going in a few days to try





*Mount Sarmiento*

to ascend it; I fear however the snow will be too thick. R. Corfield is living here, I cannot tell you how very obliging & kind he is to me. He has a very nice house & before long I am going on shore to pay him a visit; he presses me most good-naturedly to make his house my headquarters. I have had some long & pleasant walks in the country; I am afraid it is not a very good place for Natural History; after my first ride I shall know more about it.

I have received two letters from Henslow, he tells me my treasures have arrived safe & I am highly delighted at what he says about their value. What work I shall have, when I return; there will be a glorious mass of what Wickham calls d-d beastly devilment. Although Wickham always was growling at my bringing more dirt on board than any ten men, he is a great loss to me in the Beagle. He is far the most conversible being on board, I do not mean talks the most, for in that respect Sullivan quite bears away the palm. Our new artist, who joined us at M. Video, is a pleasant sort of person, rather too much of the drawing-master about him: he is very unlike to Earles eccentric character. We all jog on very well together; there is no quarrelling on board, which is something to say. The Captain keeps all smooth by rowing everyone in turn, which of course he has as much right to do, as a





*Low's Channel, Strait of Magellan*

gamekeeper to shoot Partridges on the first of September.

When I began this long straggling letter, I had intended to have sent it per Admiralty, but now it must be sent by Liverpool, so there will be double postage to pay. Thank most affectionately those good dear ladies, Sarah W. & Fanny B. I am very sorry to find I have lost the second of Mr Owen's letters. Remember me at Maer, Woodhouse, & I believe those two houses will include every one I shall care anything about when I return. How everything will be altered by that time; looking at things from a distance, they appear to be undergoing changes far faster than when living amongst them. Will Erasmus be married? all these gay doing with cab & horses portend something eventful. Can he build a castle in the air, where he does not quarrel with his wife in the first week? If he has arrived at such a pitch I know well I shall find him a well-broken-in subjected husband. Give my best love to my Father, Erasmus & each of the Sisterhood.

Dear Katty,

Your most affectionate brother,  
Charles Darwin

There are several good dear people whom I should like much to write to, but at present I really have not the time. Thank Fanny for her nice good natured note: I



have just re-read it. The sight of her handwriting is enough alone to make me long for this voyage to come to some end.

*Darwin and Beagle* pp.100-4

The *Beagle* and the *Adventure* arrived at Valparaiso on July 22nd. Here FitzRoy proposed to remain for the rest of the Southern hemisphere winter in order to complete the charts of the eastern coast of Patagonia, of Tierra del Fuego, and of the Falkland Islands. But first he was compelled to dispose of the *Adventure*.

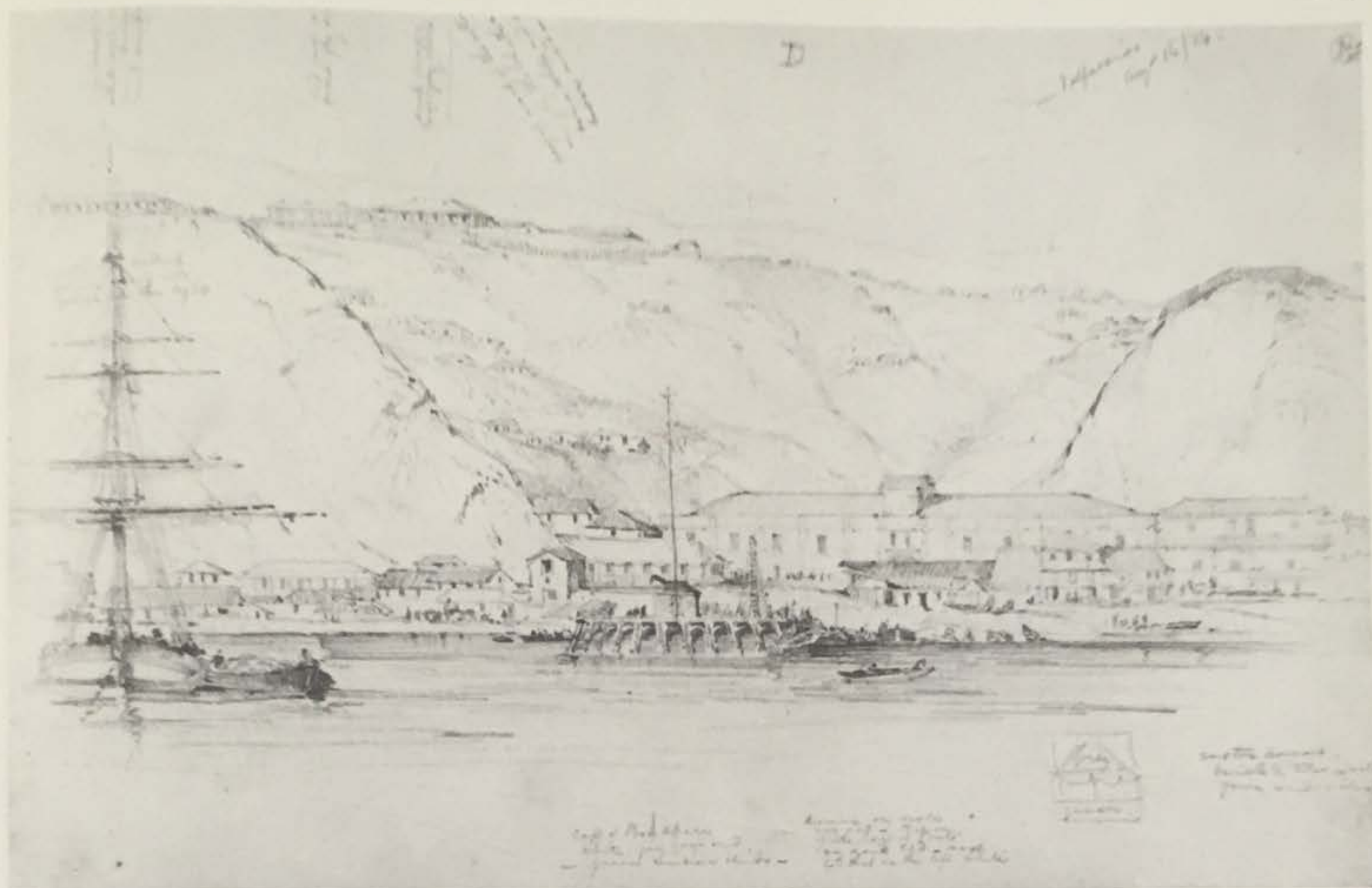
At this time I was made to feel and endure a bitter disappointment; the mortification it caused preyed deeply, and the regret is still vivid. I found that it would be impossible for me to maintain the *Adventure* much longer: my own means had been taxed, even to involving myself in difficulties, and as the Lords Commissioners of the Admiralty did not think it proper to give me any assistance, I saw that all my cherished hopes of examining many groups of islands in the Pacific, besides making a complete survey of the Chilian and Peruvian shores, must utterly fail. I had asked to be allowed to bear twenty additional seamen on the *Beagle's* books, whose pay and provisions would then be provided by Government, being willing to defray every other expense myself; but even this was refused. As soon as my mind was made up, after a most painful struggle, I discharged the *Adventure's* crew, took the officers back to the *Beagle*, and sold the vessel.

*Narrative* 2 pp.361-2

Darwin spent the next three and a half months on shore, but for nearly half this time he was in bed with an unidentified illness contracted during one of his trips into the mountains.

JULY 23rd - 31st. Late in the night the *Beagle* & *Adventure* came to an anchor. When morning came everything appeared delightful; after Chiloe & T. del Fuego we felt the climate quite delicious; the sky so clear & blue, the air so dry & the sun so bright, that all nature seemed sparkling with life. The view from the Anchorage is very pretty; the town is built on the very foot of [a] range of hills, which are 1600 feet high, & tolerably steep; the surface is worn into numberless little ravines, which exposes a singularly bright red soil, between patches of light green grass & low shrubs. It is perhaps for this reason & the low white-washed houses with tile roofs, that the view reminded *me* of Teneriffe & others of Madeira. The harbor is not large & the shipping is crowded together. In a N.E. direction there are some fine glimpses of the Andes. These, however, appear much grander when viewed from the neighbouring hills; we then better perceive how far distant they are situated. The Volcano of Aconcagua is especially beautiful. The Cordilleras, however, viewed from this point, owe the greater part of their charms to the atmosphere through which they are seen; when the sun sets in the Pacific it is admirable to watch how clearly the rugged outline of their peaks can be seen, yet how varied & how delicate is the tint of their colors. When





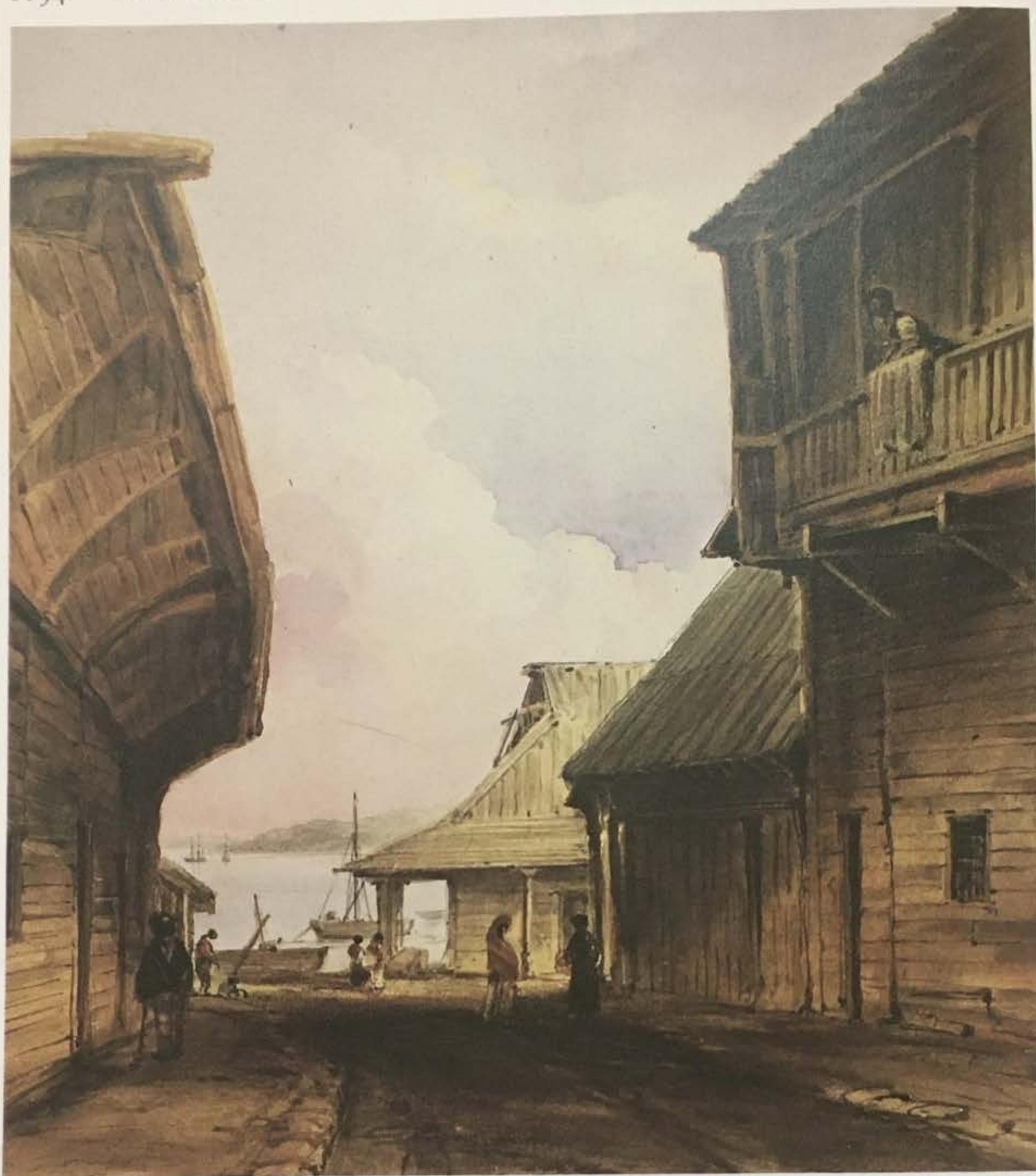
*Harbour of Valparaiso*

in T. del Fuego, I began to think the superiority of Welsh mountain scenery only existed in my imagination. Now that I have again seen in the Andes a grand edition of such beauties, I feel sure of their existence. I have taken several long walks, but I have not ceased to be surprised to find one day after another as fine as the foregoing: what a difference does climate make in the enjoyment of life. How opposite are the sensations, when viewing black mountains half enveloped in clouds, & seeing another range through the light blue haze of a fine day: the one for a time may be very sublime, the other is all gayety & happy life.

The town of Valparaiso is from its local situation a long straggling place; wherever a little valley comes down to the beach the houses are piled up on each other, otherwise it consists of one street running parallel to the coast. We all, on board, have been much struck by the great superiority in the English residents over other towns in S. America. Already I have met with several people, who have read work on geology & other branches of science, & actually take interest in subjects no way connected with bales of goods & pounds, shillings & pence. It was as surprising as pleasant to be asked, what I thought of Lyell's Geology. Moreover every one seems inclined to be very friendly to us, & all hands expect to spend the two ensuing months very pleasantly.

AUG. 2nd. Took up my residence with Mr Cornfield, who has taken the most obliging pains to render me all assistance in my pursuits. His house is situated in





*San Carlos de Chiloe*

the Almendral, which is an extensive suburb built on [a] small sand-plain, which very recently has been a sea-beach. The house is a very pleasant one; one story high, with all the rooms opening into a quadrangle; there is a small garden attached to it, which receives a small stream of water 6 hours in the week. Another gentleman lives with Mr Corfield; the expences of the house, table, wine, 2 men servants, 3 or 4 horses, is about 400 pounds sterling per annum. I should think this same establishment in England would at least cost double this sum.

5th. I have taken several long walks in the country. The vegetation here has a peculiar aspect; this is owing to the number & variety of bushes which seem to supply the place of plants; many of them bear very pretty flowers & very commonly the whole shrub has a strong resinous or aromatic smell. In climbing





*San Carlos de Chiloe*

amongst the hills one's hands, & even clothes, become strongly scented. With this sort of vegetation I am surprised to find that insects are far from common; indeed this scarcity holds good to some of the higher orders of animals; there are very few quadrupeds, & birds are not very plentiful. I have already found beds of recent shells, yet retaining their colors at an elevation of 1300 feet; & beneath this level the country is strewn with them. It seems not a very improbable conjecture that the want of animals may be owing to none having been created since this country was raised from the sea.

*Diary pp. 234-6*

C. D. TO PROFESSOR HENSLOW

Valparaiso July 24th 1834

My dear Henslow

A box has just arrived, in which were two of your most kind & affectionate letters; you do not know how happy they have made me. One is dated Dec. 12th 1833 the other Jan: 15th of the *same year*! By what fatality it did not arrive sooner, I cannot conjecture: I regret it much; for it contains the information I most wanted about manner of packing etc etc: roots, with specimens of plants etc etc: this I suppose was written after the reception of first cargo of specimens. Not having heard from you untill March of this year; I really began to think my collections





*Church in Valparaiso*

were so poor, that you were puzzled what to say: the case is now quite on the opposite tack; for you are *guilty* of exciting all my vain feelings to a most comfortable pitch: if hard work will atone for these thoughts I vow it shall not be spared. It is rather late, but I will allude to some remarks in the Jan: letter: you advise me to send home duplicates of my notes; I have been aware of the advantage of doing so; but then at sea to this day, I am invariably sick, excepting on the finest of days; at which times with pelagic animals around me, I could never bring myself to the task; on shore the most prudent person, could hardly expect such a sacrifice of time. My notes are becoming bulky; I have about 600 small quarto pages full; about half of this is Geology, the other imperfect descriptions of animals: with the latter I make it a rule only to describe those parts which cannot be seen, in specimens in spirits. I keep my private Journal distinct from the above. (N.B. this letter is a most untidy one, but my mind is untidy with joy: it is your *fault*, so you must take the consequence).

With respect to the land Planariae: unquestionably they are not Molluscos animals: I read your letter last night, this morning I took a little walk: by a curious coincidence I found a new white species of Planaria & a new to me Vaginulus (3rd species which I have found in S. America) of Cuv: I suppose this is the animal Leonard Jenyns alludes to – the *true Onchidium* of Cuv: I likewise know. Amongst marine Mollusques I have seen a good many genera & at Rio found one quite new one.



With respect to the December letter, I am very glad to hear, the four casks arrived safe; since which time you will have received another cargo, with the bird skins about which you did not understand me. Have any of the B. Ayrean seeds produced plants? From the Falklands, I acknowledge[d] a box & letter from you; with the letter were a few seeds from Patagonia. At present I have specimens enough to make a heavy cargo, but shall wait as much longer as possible, because opportunities are not so good now as before. I have just got scent of some fossil bones of a MAMMOTH! what they may be, I do not know, but if gold or galloping will get them, they shall be mine. You tell me, you like hearing how I am going on & what doing; & you well may imagine how much I enjoy speaking to anyone upon subjects, which I am always thinking about, but never have anyone to talk with.

After leaving the Falklands, we proceeded to the R.S. Cruz; followed up the river till within 20 miles of the Cordilleras: Unfortunately want of provisions compelled us to return. This expedition was most important to me, as it was a transverse section of the great Patagonian formation. I conjecture (an accurate examination of fossils may possibly determine the point) that the main bed is somewhere about the Miocene period (using Mr Lyell's expression) – I judge from what I have seen of the present shells of Patagonia. This bed contains an enormous field of Lava. This is of some interest, as being a rude approximation to the age of the Volcanic part of the great range of the Andes. Long before this it existed as a Slate or *Porphyritic* line of hills. I have collected tolerable quantity of information respecting the period, (even numbers) & forms of elevations of these plains. I think these will be interesting to Mr Lyell. I had deferred reading his third volume till my return; you may guess how much pleasure it gave me; some of his woodcuts came so exactly into play, that I have only to refer to them, instead of re-drawing similar ones. I had my Barometer with me; I only wish I had used it more in these plains. The valley of S. Cruz appears to me a very curious one, at first it quite baffled me. I believe I can show good reasons for supposing it to have been once a Northern Stts like that of *Magellan*.

When I return to England, you will have some hard work in winnowing my Geology; what little I know, I have learnt in such a curious fashion, that I often feel very doubtful about the number of grains: Whatever number they may turn out, I have enjoyed extreme pleasure in collecting them. In T. del Fuego I collected & examined some Corallines: I have observed one fact which quite startled me – it is, that in the genus *Sertularia*, (taken in its most restricted form as by Lamouroux) & in 2 species which, excluding comparative expressions, I should find much difficulty in describing as different, the Polypi quite & essentially differed, in all their most important & evident parts of structure. I have already seen enough to be convinced that the present families of Corallines, as arranged by Lamarck, Cuvier etc are highly artificial. It appears they are in the same state which shells were when Linnaeus left them for Cuvier to rearrange. I do so wish I was a better hand at dissecting: I find I can do very little in the minute parts of structure; I am forced to take a very rough examination as a type for different classes of structure. It is most extraordinary I can no where see in my





*Bay of Valparaíso looking towards Viña del Mar*

books one single description of the polypus of any one Corall (excepting *Lobularia alcyonium* of Savigny). I found a curious little stony *Cellaria* (a new genus) each cell provided with [a] long toothed bristle; these are capable of various & rapid motions – this motion is often simultaneous & can be produced by irritation. This fact, as far as I see, is quite isolated in the history (excepting by the *Flustra*) with organ like *Vultures Head* of *Zoophites* – it points out a much more intimate relation between the *Polypi*, than Lamarck is willing to allow. I forget, whether I mentioned, having seen something of the manner of propagation in that most ambiguous family, the *Corallines*: I feel pretty well convinced if they are not Plants, they are not *Zoophites*: the ‘*gemmae*’ of a *Halimeda* contained several articulations united & ready to burst their envelope & become attached to some basis. I believe in *Zoophites*, universally the *gemmae* produces a single *Polypus*, which afterwards or at the same time, grows with its cell or single articulation.

The *Beagle* left the *Sts of Magellan* in the middle of winter; she found her road out by a wild unfrequented channel; well might Sir J. Narborough call the West coast South Desolation ‘because it is so desolate a land to behold’. We were driven into *Chiloe* by some very bad weather. An Englishman gave me 3 specimens of



that very fine Lucanoidal insect, which is described Camb: Phil: Trans: 2 males & one female. I find Chiloe is composed of Lava & recent deposits – the Lavas are curious from abounding or rather being in parts composed of Pitchstone. If we go to Chiloe in the Summer I shall reap an Entomological harvest. I suppose the Botany both there & in Chili is well known. I forgot to state, that in the four cargoes of specimens there have been sent 3 square boxes, each containing four glass bottles. I mention this in case they should be stowed beneath geological specimens, & thus escape your notice; perhaps some spirit may be wanted in them. If a box arrives from B. Ayres, with Megatherium head & other *unnumbered* specimens: be kind enough to tell me; I have strong fears for its safety.

We arrived here the day before yesterday; the views of the distant mountains are most sublime & the climate delightful; after our long cruize in the damp gloomy climates of the South, to breathe a clean, dry air, & feel honest warm sunshine, & eat good fresh roast beef must be the summum bonum of human life. I do not like the looks of the rocks, half so much as the beef; there is too much of those rather insipid ingredients mica, quartz & Feldspar. Our plans are at present undecided – there is a good deal of work to the South of Valparaiso, & to the North an indefinite quantity. I look forward to every part with interest. I have sent you in this letter a sad dose of egotism – but recollect I look up to you as my father in Natural History, & a son may talk about himself, to his father. In your paternal capacity, as pro-proctor, what a great deal of trouble you appear to have had. How turbulent Cambridge is become. Before this time it will have regained its tranquillity. I have a most schoolboy like wish to be there, enjoying my Holydays. It is a most comfortable reflection to me, that a ship being made of wood & iron, cannot last for ever & therefore this voyage must have an end.

[continued on p.241]

C.D. TO MISS CAROLINE DARWIN

[no address] August 9th 1834

My dear Caroline

A ship sails for Liverpool tomorrow. I will try to scribble this sheet full & if so send it off. I received your letter dated March 9th the day before yesterday, & Mr Owen's long one. Give him my best thanks for writing so kindly to me: I will take an early opportunity of answering it.

I am very much pleased with what you have told me respecting the fossil bones. I did not before understand in what particular way the head of the Megatherium came to be so much sought after. I presume the big box, which Erasmus was going to send to Plymouth for, is one which I directed to be left at Dr Armstrong's (to save carriage). I am in great fear lest Mr Clift should remove the numbers or markers attached *to any of the specimens*. Ask Erasmus to call on Mr Clift & state how anxious I am on this point. All the interest which I individually feel about these fossils is their connection with the geology of the Pampas, & this entirely rests on the safety of the numbers. Another point must clearly be explained to Mr Clift; it is with reference to the Coll: of Surgeons paying the



expence of the carriage. The ultimum destinatum of *all* my collections will of course be to wherever they may be of most service to Natural History. But, *ceteris paribus*, the British Museum has the first claims, owing to my being on board a King's Ship. Mr Clift must understand that *at present* I cannot say that any of the fossil bones shall go to any particular Museum. As you may well believe, I am quite delighted that I should have had the good fortune (in spite of sundry sneers about seal & Whale bones) to have found fossil remains which can interest people such as Mr Clift. A small box has been forwarded from B. Ayres to Liverpool for Henslow, with part of a head which I think will be more useful than any which I have sent. With respect to the expence of the carriage it is entirely in England, everything *as yet* has been sent on the sea on 'His Majesties Service'. But they are very heavy & bulky.

Give my Father my best love & thanks for all his kindness about money, & tell him I can seriously say that since leaving England I have spent none excepting in the furtherance of Natural History, & as little as I could in that, so that my time should not be thrown away. I am now living with Corfield; he is as hospitable & kind in deeds, as a Spaniard is in professions – than which I can say no more. It is most pleasant to meet with such a straitforward, thorough Englishman, as Corfield is, in these vile countries. He has made his house so pleasant to me, that I have done less during the last fortnight, than in any time since leaving England. The day after tomorrow I start for a Geological excursion. Does it not *sound* awfully extravagant when I say I am going to buy a small troop of horses; with these I shall travel by a very round-about course to St Jago, the gay Capital of Chili. I shall there meet Corfield, who is going up to admire the beauties of nature in the form of Signoritas, whilst I hope to admire them amongst the Andes. I long to have a near view of this extraordinary & grand chain of mountains. At this time of year however, it will not be possible to ascend to any height on account of the snow.

This a very stupid letter to send, but you have often told me you would rather have a short letter than none. So take the consequences. Give my best love to Marianne; we do not write to each other for the same reason, we are too busy with our children – she with Master Robert & Henry &c, & I with Master Megatherium & Mastodon. If I have a good opportunity, I will send home some more of my journal; which will give you some account of the Pampas galloping. I am ashamed for sending such a letter, but take the will for the deed & Believe me, my dearest Caroline,

Yours most affectionately

Chas Darwin

August 12th

My love to every body at home

*Darwin and Beagle* pp. 104–6



R.F. TO CAPTAIN BEAUFORT

H.M.S. Beagle, Valparaiso, 14th Augt 1834  
Private

My dear Captain Beaufort,

Since arriving at this port on the 23rd of July, I have received your very kind letters of April 2nd and May 7th, with their numerous accompaniments.

Indeed I am most truly grateful to you for the friendly cordial expression of *all* – but more particularly those *last* letters. The approbation of such a friend is a very high reward. But when I read your letters, and reflect upon the many idle hours I have passed, I feel ashamed of myself, and conscious of not deserving all that you say. Those who are with me work harder than I and deserve more encouragement.

A merchantman going to Liverpool tempts me to send you a short letter, of this kind – though the conveyance is not sure enough to make it worth while writing officially. The Samarang will sail hence, for England, at the end of September, and by her I shall write at full length.

Another budget is preparing for the Hl. Office, but as there is much material I doubt whether it will be ready for the Samarang. I shall however try hard. The Falkland Survey is better than I had reason to expect – *all* the exterior is well laid down. There was much to do about the eastern entrance of the Straits of Magellan – extensive banks and very difficult tides. I do not think that the present copper plates of Magellan's Strait will allow of the new work being combined with the old – a new edition will perhaps be required. The title of the present charts stands in the way of an extensive and well sheltered port on the east coast of Tierra del Fuego.

We are now lying quiet in a snug corner of Valparaiso bay, refitting the ship and working at our business. I am sorry to say that Stokes suffers much from the affection of his chest which I mentioned in an official letter. Sometimes I am obliged to forbid his touching a chart for days together.

Since I last wrote to you, from the Falklands, the Purser, Mr George Rowlett, has died. He was with Captain King in the Adventure. Poor Skyring – I lament his loss very much indeed. That horrible coast of Africa is always augmenting the long list of victims. Landers has fared no better than the noble characters who have gone before him in endeavouring to explore that fatal country.

My messmate Darwin is now roaming amongst the Andes – he left here a week ago intending to wander until the end of September. Mr Martens (the Artist) is at work on shore, living with an *exceedingly* able man of the same profession, a German by name 'Rugendas'. Pray when you have five minutes to bestow upon *beautiful* prints ask at a shop for 'Voyage pittoresque en Bresil' par M. Rugendas, published by 'Engelmann Graf & Coindet', Newman St. They are the most faithful, the very best delineations of Tropical scenery and human beings that I have seen or can imagine it possible to produce. Rugendas has been lately in Mexico, and is now here, collecting material for another work.

The Schooner Adventure is lying near the Beagle. It will grieve me sadly to bring her to the hammer, but my friends are very seriously urgent that I should



*retrench (reform!)*, and I see no prospect of the Admiralty rendering me any assistance. Hampering myself I should not mind, but I cannot treat lightly the entreaties of my dearest relations. I am meditating her sale.

Commodore Mason has just arrived in the *Blonde*. He has received me very cordially, though a stranger, owing I believe to your kind offices in England.

I have received a most satisfactory document from the President of Chili, by which I find myself at liberty to do all that is necessary for the execution of your orders upon these coasts, and authorised to call upon the various local authorities for their assistance. Letters have been sent to the outports, of a similar tenor. As soon as I arrived, I sent a copy of my orders to the Government, and requested permission to do what was necessary.

My last letter to you was from the Falklands, in April. Part of that month and part of May were passed in the Santa Cruz river. Twenty three of us tracked three boats up that river against a six knot stream for twenty days, when the Andes stretched themselves from North to South in opposition to our further progress. The river was as wide and as rapid as at first, and from what could be measured from the temperature of the water I conclude that its source lies some degrees of latitude to the Northward of its mouth, and that it follows the foot of the Cordillera until it sallies due east across the Patagonian Desert. The country was everywhere barren and desolate – only Guanacoes, Condors, and foxes were seen. To Darwin the geology was very interesting. The average width of the river was a cable's length, the mid-channel depth three fathoms, the stream varying in strength from six to eight knots.

Before quitting the river the *Beagle's* copper was examined and put to rights.

We called at Chiloe in our way here. I purpose staying until the end of September, and then returning to Southern regions.

Believe me, my dear Captain Beaufort, most truly & respectfully yours,  
Robt FitzRoy

P.S. The Naut. Almcs have arrived, with Chart paper, pens, &c &c.

[from the archives of the Hydrographic Department, Taunton]

AUG. 16th. The Major Domo of the Hacienda was good enough to give me a guide & fresh horses; in the morning we set out to ascend the Campana or Bell, a mountain which is 6400 feet high. The paths were very bad, but both the geology & scenery amply repaid the trouble. We reached, by the evening, a spring called the Agua del Guanaco, which is situated at a great height. This must be an old name, for it is very many years since a guanaco has drunk its waters. During the ascent I noticed that on the Northern slope nothing but bushes grew, whilst on the Southern a sort of bamboo about 15 feet high. In a few places there were palms, & I was surprised to see one at an elevation of at least 4500 feet. This palm is for its family an ugly tree: its stem is very large & of a curious form, being thicker in the middle than at the base or top. They are excessively numerous in some parts of Chili & valuable on account of a sort of honey made from the sap. On one estate near Petorca they counted many hundred thousand trees; each year



in August or September many are cut down; when lying on the ground (& it is necessary, I am told, that the trees should fall up the hill) the crown of leaves is cut off, & the sap begins to flow from the upper end. This continues for many months, but it is necessary every morning that a thin slice should be cut off, so as to expose a fresh surface. A good tree will give 90 gallons of Sap, which must all have been contained in the apparently dry trunk; it is said to flow much more quickly on those days when the sun is powerful. The sap is concentrated by boiling, & is called honey, which in its taste it resembles. We unsaddled our horses near the spring & prepared to pass the night. The setting of the sun was glorious, the valleys being black whilst the snowy peaks of the Andes yet retained a ruby tint. When it was dark, we made a fire beneath a little arbor of bamboos, fried our charqui (or dried strips of beef), took our matté, & were quite comfortable. There is an inexpressible charm in thus living in the open air. The evening was so calm & still; the shrill noise of the mountain bizcacha & the faint cry of the goatsucker were only occasionally to be heard. Besides these, few birds or even insects frequent these dry parched up mountains.

17th. We climbed up to the highest ridge of the rough mass of greenstone. The rock, as is so generally the case, was much shattered & broken into angular fragments. I observed, however, here one remarkable difference, that the surfaces of many enormous fragments presented every degree of freshness, from what appeared *quite fresh*, to the state when Lichens can adhere. I felt so forcibly that this was owing to the constant earthquakes that I was inclined to hurry from beneath every pile of the loose masses.

We spent the whole day on the summit, & I never enjoyed one more thoroughly. Chili & its boundaries the Andes & the Pacifick were seen as in a Map. The pleasure from the scenery, in itself beautiful, was heightened by the many reflections which arose from the mere view of the grand range, its lesser parallel ones & of the broad valley of Quillota which directly cuts these in two. Who can avoid admiring the wonderful force which has upheaved these mountains, & even more so the countless ages which it must have required to have broken through, removed & levelled, whole masses of them?

The appearance of the Andes was different from what I expected; the lower line of the snow was of course horizontal, & to this line the even summits of the range appeared quite parallel. At long intervals, a mass of points or a single cone showed where a Volcano had or does now exist. It hence looked more like a wall, than a range of separate mountains, & made a most complete barrier to the country.

Almost every part of this mountain has been drilled by attempts to open Gold mines. I was surprised to see on the actual summit, a small pit where some yellow crystals had induced some people thus to throw away their labor; & this on a point which can only be reached by climbing. The rage for mining has left scarcely a spot in Chili unexamined, even to the regions of eternal snow.

I spent the evening, as before, talking round our fire with my two companions. The Guassos of Chili, which correspond to the Gauchos of the Pampas, are however a very different set of beings. Chili is the more civilized of the two countries; & the inhabitants in consequence have lost much individual character.



Gradations in rank are much more strongly marked; the Huasso does not by any means consider every man his equal; I was quite surprised to find my companions did not like to eat at the same time with myself. This is a necessary consequence of the existence of an aristocracy of wealth; it is said that some few of the greater land owners possess from five to ten thousand pounds sterling per annum. This is an inequality of riches which I believe is not met with in any of the cattle-breeding countries to the eastward of the Andes. A traveller by no means here meets that unbounded hospitality which refuses all payment, but yet is so kindly offered, that no scruples can be raised in accepting it. Almost every house in Chili will receive you for the night, but then a trifle is expected to be given in the morning: even a rich man will accept of two or three shillings. The Gaucho, although he may be a cut-throat, is a gentleman; the Huasso is in few respects better, but at the same time is a vulgar, ordinary fellow. The two men, although employed much in the same manner, are different in their habits & clothes; & the peculiarities of each are universal in their respective countries. The Gaucho seems part of his horse, & scorns to exert himself excepting when on its back; the Huasso can be hired to work as a labourer in the fields. The former lives entirely on animal food, the latter nearly as much on vegetable. We do not here see the white boots, the broad drawers & scarlet Chilipa – the picturesque costume of the Pampas; here common trowsers are protected by black & green worsted leggings: the poncho, however, is common to both. The chief pride of the Huasso lies in his spurs, these are absurdly large. I measured one that was six inches in the diameter of the rowel, & the rowel itself contained upwards of thirty points: the stirrups are on the same scale, each one consisting of a square carved block of wood, hollowed out, yet weighing three or four pounds. The huasso is perhaps more expert with the lazo than the gaucho, but from the nature of the country, does not know the use of the bolas.

*Diary pp. 238–40*

AUG. 28th. I staid a week in St Jago & enjoyed myself very much: in the mornings I rode to various places in the plain, & in the evenings dined with different merchants. A never failing source of delight was to mount the little pap of rock (Fort of St Lucia) which stands in the middle of the city; the scenery certainly is very striking, & as I have said, very peculiar. I am informed that this same character is common to some of the Mexican cities. Of the town itself there is nothing to be said; generally it is not so fine or so large as B. Ayres, but built on same model.

I had arrived here by a circuit to the North, & I determined to return to Valparaiso by a longer circuit to the South. (September 5th.) By the middle of the day, we crossed one of the famous suspension bridges of Hide. They are miserable affairs & much out of order. The road is not level as at the Menai, but follows the curvature of the suspending ropes. The road part is made of bundles of sticks & full of holes; the bridge oscillates rather fearfully with the weight of a man leading a horse. In the evening we reached a very nice Hacienda; where there were several very pretty Signoritas; they turned up their charming eyes in pious horror at my



having entered a Church to look about me; they asked me why I did not become a Christian, 'for our religion is certain?' I assured them I was a sort of Christian; they would not hear of it, appealing to my own words, 'Do not your padres, your very bishops, marry?' The absurdity of a Bishop having a wife particularly struck them; they scarcely knew whether to be most amused or horrified at such an atrocity.

*Diary* pp.243-4

C.D. TO R.F.

St Jago, Thursday [28 August]

My dear FitzRoy,

I arrived at this gay city late last night, and am now most comfortably established at an English Hotel. My little circuit by Quillota and Aconcagua was exceedingly pleasant. The difficulty in ascending the Campana is most absurdly exaggerated. We rode up 5/6ths of the height to a spring called the Agua del Guanaco, & there bivouacked for two nights in a beautiful little arbor of Bamboos. I spent one whole day on the very summit, the view is not so picturesque, as interesting from giving so excellent a plan of the whole country from the Andes to the sea. I do not think I ever more thoroughly enjoyed a days rambling. From Quillota I went to some Copper Mines beyond Aconcagua situated in a Ravine in the Cordilleras. The major domo is a good simple hearted Cornish Miner. It would do Sullivan good to hear his constant exclamation 'As for London - what is London? they can do anything in my country'. I enjoyed climbing about the mountains to my hearts content, the snow however at present quite prevents the reaching any elevation. On Monday my Cornish friend and myself narrowly escaped being snowed in. We were involved in a multitude of snow banks, and a few hours afterwards there was a heavy snow-storm which would have completely puzzled us. The next morning I started for this place. I never saw anything so gloriously beautiful as the view of the mountains with their fresh and brilliant clothing of Snow. Altogether I am delighted with the Country of Chile. The Country Chilenos themselves appear to me a very uninteresting race of people. They have lost much individual character in an *essay towards an approximation* to civilization.

My ride has enabled me to understand a little of the Geology. There is nothing of particular interest. All the rocks have been frizzled melted and bedevilled in every possible fashion. But here also the 'confounded Frenchmen' have been at work. A. M. Gay has given me today a copy of a paper, with some interesting details about the Geology of this province published by himself in the *Annales des Sciences*.

I have been very busy all day, and have seen a host of people. I called on Col Walpole, but he was in bed - or said so. Corfield took me to dine with a Mr Kennedy, who talks much about the Adventure & Beagle; he says he saw you at Chiloe. I have seen a strange genius, a Major Sutcliffe; he tells me as soon as he heard there were two English Surveying Vessels at Valparaiso, he sent a Book of Old Voyages in the Straits of Magellan to Mr Caldcleugh, to be forwarded to the



Commanding Officer as they might prove of service. He has not heard whether Mr Caldcleugh has sent them to you. I told him I would mention the circumstance when I wrote. The Major is inclined to be very civil. I do not know what to make of him. He is full of marvellous stories; and to the surprise of everyone, every now & then some of them are proved to be true.

My head is full of schemes; I shall not remain long here, although from the little I have yet seen I feel much inclined to like it. How very striking & beautiful the situation of the city is. I sat for an hour gazing all round me from the little hill of St Lucia. I wish you could come here to readmire the glorious prospect. I can by no means procure any sort of Map – you could most exceedingly oblige me if you would get King to trace from Miers a little piece of the Country from Valparaiso to a degree south of R. Rapel, without any mountains. I do not think it will be more than  $\frac{1}{2}$  an hours work. I have some intention of returning to Valparaiso by the Rapel. If you would send me this *soon* and half a dozen lines mentioning if you should know anything about the *Samarang's* movements, it would assist me in my schemes very much. Adios, dear FitzRoy,

Yr faithful Philos,  
C.D.

My direction is the Fonda Inglese.

[from a handwritten transcript made for Sir Francis Darwin, Cambridge University Library DAR. 144]

SEPT. 13th. We escaped from our foodless prison, & rejoining the main road slept at the village of Rio Claro. (14th.) From this place we rode on to the town of S. Fernando. Before arriving there, the inland basin expands into a great plain, which to the South is so extensive, that the snowy summits of the distant Andes were seen as over the horizon of the sea. S. Fernando was my furthest point to the South; it is 40 leagues from St Jago. From this point I turned at right angles to seaward. We slept at the gold mines of Yaquil near Nancagua, in the possession of Mr Nixon, an American gentleman. I staid at this place four days, during two of which I was unwell. Where Mr Nixon lives the Trapiche or grinding mill is erected; the mine itself is at the distance of some leagues & nearly at the summit of [a] high hill. On the road we passed through some large woods of the Roble or Chilian oak; this tree from its ruggedness & shape of leaf & manner of growth deserves its name. This is its furthest limit to the North. I was glad to see anything which so strongly reminded me of England. To the South there was a fine view of the Andes including the Descabezado described by Molina. To the North I saw part of the lake of Taguatagua, with its floating islands: these islands (described by M. Gay) are composed of various dead plants, with living vegetation on the surface; they float about four feet above the surface: as the wind blows they pass over the lake, carrying with them cattle & horses.

When we arrived at the mine, I was struck by the pale appearance of many of the men, & enquired from Mr Nixon respecting their state. The mine is altogether 450 feet deep, each man brings up on his back a quintal, or 104 lbs. weight of stone. With this load they have to climb up the alternate notches cut in trunks of



trees placed obliquely in the shaft. Even beardless young men of 18 & 20 years with little muscular development of their bodies (they are quite naked excepting drawers) carry this great load from nearly the same depth. A strong man, who is not accustomed to this sort of exercise, perspires most profusely with merely carrying his own body up. With this very severe labor they are allowed only beans & bread; they would prefer living entirely upon the latter; but with this they cannot work so hard, so that their masters, treating them like horses, make them eat the beans. Their pay is 25 or 30s. per month. They only leave the mine once in three weeks, when they remain with their families two days. This treatment, bad as it sounds, is gladly accepted; the state of the labouring Agriculturist is much worse, many of them eat nothing but beans & have still less money. This must be chiefly owing to the miserable feudal-like system by which the land is tilled. The land-owner gives so much land to a man, which he may cultivate & build on, & in return has his services (or a proxy) for every day for his life gratis. Till a father has a grown up son to pay his rent by his labour, of course there is no one to take care of the patch of ground. Hence poverty is very common with all the labouring classes.

One of the rules of this mine sounds very harsh, but answers pretty well. The method of stealing gold is to secrete pieces of the metal & take them out as occasion may offer. Whenever the Major-domo finds a lump of ore thus hidden, its full value is stopped out of the wages of all the men, who thus are obliged to keep watch on each other. The ore is sent down to the mills on mules. I was curious to enquire about the load which each mule carries: on a *level road* the regular cargo weighs 416 pounds. In a troop there is a muleteer to every six mules. Yet to carry this enormous weight, what delicate slim limbs they have; the bulk of muscle seems to bear no proportion to its power. The mule always strikes me as a most surprising animal: that a Hybrid should possess far more reason, memory, obstinacy, powers of digestion & muscular endurance, than either of its parents. One fancy art has here out-mastered Nature.

When the ore is brought to the Mill it is ground into an impalpable powder; the process of washing takes away the lighter particles & amalgamation at last secures all the gold dust. The washing when described sounds a very simple process: but it is at the same time beautiful to see how the exact adaptation of the current of water to the Specific Gravity of the gold so easily separates it from its matrix. It is curious how the minute particles of gold become scattered about, & not corroding, at last accumulate even in the least likely spots. Some men asked permission to sweep the ground round the house & mill; they washed the earth & obtained 30 dollars worth of gold.

In Mr Nixon's house a German collector, Renous, was staying. I was amused by a conversation which ensued between Renous (who is taken for a Chilian) & an old Spanish lawyer. Renous asked him what he thought of the King of England sending out me to their country to collect Lizards & beetles & to break rocks. The old Gentleman thought for some time & said, 'it is not well,—hay un gato encerrado aqui' 'there is a cat shut up here'; 'no man is so rich as to send persons to pick up such rubbish; I do not like it; if one of us was to go & do such things in



England, the King would very soon send us out of the country'. And this old gentleman, from his profession, is of course one of the more intelligent classes! Renous himself, two or three years ago, left some Caterpillars in a house in S. Fernando under charge of a girl, to turn into Butterflies. This was talked about in the town, at last the Padres & the Governor consulted together & agreed it must be some Heresy, & accordingly Renous when he returned was arrested.

*Diary* pp.246-8

R.F. TO CAPTAIN BEAUFORT, PRIVATE

Beagle, Valparaiso, 26 Septr/34

Dear Captain Beaufort,

Will you allow the accompanying letters to be forwarded. They are duplicates of some letters on business – which I have sent with your letters – by the Samarang. Perhaps these duplicates sent by a Merchantman may arrive first.

I am ever Your's most sincerely and respectfully

Robt FitzRoy

My Schooner is *sold*. Our painting man Mr Martens is *gone*. The Charts &c are progressing slowly – They are not ready to send away yet – I am in the dumps. It is heavy work – all work and no play – like *your* Office, something – though not half so bad probably.

God bless you.

[from the archives of the Hydrographic Department, Taunton]

R.F. TO CAPTAIN BEAUFORT, PRIVATE

H.M.S. Beagle, Valparaiso, 28th Septr 1834

My dear Captain Beaufort,

I cannot let the Samarang go to England without a few lines from me to so kind a friend as yourself.

Troubles and difficulties harass and oppress me so much that I find it impossible either to say or do what I wish. Excuse me then I beg of you if my letters are at present short and unsatisfactory – My mind will soon be more at ease. Letters from my friends – Having been obliged to sell my Schooner, and crowd every thing again on board the Beagle – Disappointment with respect to Mr Stokes – also the acting Surgeon – and the acting Boatswain – Continual hard work – and heavy expense – – These and many other things have made me ill and very unhappy.

The Beagle has been refitting, while the paper work has been going on steadily. When I look back at the time we have been in Valparaiso, I am annoyed at it's length and yet I cannot see any way by which it could have been made shorter. Much material had been collected, and must have been put together somewhere. I see no hope of finishing before the middle or latter part of October. I have affronted and half quarrelled with most people by shutting myself up and refusing to visit or be visited. As Captain of a Ship in a bustling sea port it is a difficult matter to keep sufficiently quiet to make such progress as one would wish. Yet to



this port a vessel *must* come for supplies. Besides after a long cruize, upon salt meat, it is absolutely necessary that the Crew should have fresh meat and Vegetables for sufficient time to do away with all scorbutic inclinations.

I sold my Schooner a fortnight ago, for more than I first gave for her, but not near enough to cover what has been laid out upon her, or what her crew and provisions have cost.

Mr Langtry, a Lieut in the Navy, is here, in command of a large merchant ship just arrived from the Columbia River. He begs me to present his respects to you, and has sent me his plans of that river to copy for you. The Admiralty plan is, he says, quite erroneous.

Now my dear Captain Beaufort, I will say no more until I have completed my cargo for the Hl. Offe. Then indeed I shall feel lighter in spirits and able to write to you freely on many subjects which I have not now mentioned.

Ever your's most respectfully and sincerely,  
Robt FitzRoy

[from the archives of the Hydrographic Department, Taunton]

C.D. TO MISS CAROLINE DARWIN

Valparaiso October 13th 1834

My dear Caroline

I have been unwell & in bed for the last fortnight, & am now only able to sit up for a short time. As I want occupation, I will try & fill this letter. Returning from my excursion into the country I staid a few days at some Gold-mines & whilst there I drank some Chichi, a very weak, sour, new made wine, this half poisoned me. I staid till I thought I was well; but my first days ride, which was a long one, again disordered my stomach, & afterwards I could not get well; I quite lost my appetite & became very weak. I had a long distance to travel & I suffered very much; at last I arrived here, quite exhausted. But Bynoe with a good deal of Calomel & rest has nearly put me right again, & I am now only a little feeble. I consider myself very lucky in having reached this place, without having tried it I should have thought it not possible; a man has a great deal more strength in him, when he is unwell, than he is aware of.

If it had not been for this accident, my riding would have been very pleasant. I made a circuit taking in St Jago. I set out by the valley of Aconcagua. I had some capital scrambling about the mountains. I slept two nights near the summit of the Bell of Quillota. This is the highest mountain out of the chain of the Andes, being 4700 ft high. The view was very interesting, as it afforded a complete map of the Cordilleras & Chili. From here, I paid a visit to a Cornish miner who is working some mines in a ravine in the very Andes. I thoroughly enjoyed rambling about, hammer in hand, the bases of these great giants, as independently as I would the mountains in Wales. I reached the snow but found it quite impossible to penetrate any higher. I now struck down to the South, to St Jago the gay capital of Chili. I spent a very pleasant week there, receiving unbounded hospitality from the few English merchants who reside there. Corfield was there also & we lived together at an inn. St Jago is built on a plain, the basin of a former inland sea; the



perfect levelness of this plain is contrasted in a strange & picturesque manner with great snow topped mountains which surround it. From St Jago I proceeded to S. Fernando about 40 leagues to the South. Every one in the city talked so much about the robbers & murderers, I was persuaded to take another man with me; this added very much to the expense, & now I do not think it was necessary. Altogether it has been the most expensive excursion I ever made, & in return I have seen scarcely enough of the Geology to repay it. I was however lucky in getting a good many fossil shells from the modern formation of Chili. On my road to S. Fernando, I had some more hammering at the Andes, as I staid a few days at the hot springs of Cauquenes, situated in one of the valleys. From S. Fernando I cut across the country to the coast, & then returned, as I have said, very miserable, to Corfields house here at Valparaiso.

You will be sorry to hear, the Schooner the Adventure is sold; the Captain received no sort of encouragement from the Admiralty, & he found the expense [of] so large a vessel so immense, he determined at once to give her up. We are now in the same state as when we left England with Wickham for 1st Lieut, which part of the business anyhow is a good job. We shall all be very badly off for room, & I shall have trouble enough with stowing my collections. It is in every point of view a grievous affair in our little world; a sad tumbling down for some of the officers, from 1st Lieut of the Schooner to the miserable Midshipmans birth – & many similar degradations. It is necessary also to leave our little painter, Martens, to wander about the world. Thank Heavens, however, the Captain positively assert that this change shall not prolong the voyage – that in less than 2 years we shall be at New S. Wales. I find being sick at stomach inclines one also to be homesick. In about a fortnight the Beagle proceeds down the coast, touches at Concepcion & Valdivia & sets to work behind Chiloe. I suspect we shall pay T del Fuego another visit; but of this good Lord deliver us: it is kept very secret, lest the men should desert, every one so hates the confounded country. Our voyage sounded much more delightful in the instructions than it really is; in fact it is a survey of S. America, & return by the C. of Good Hope instead of C. Horn. We shall see nothing of any country, excepting S. America. But I ought not to grumble, for the voyage is for this very reason, I believe, much better for my pursuits, although not nearly so agreeable as a tour.

I will write again before sailing, I am however at present deeply in debt with letters. I received shortly since a very kind long one from Mr Owen, which I will shortly answer. Letter writing is a task which I thoroughly dislike. I do not mean writing to home, but to any body else, for really after such [an] interval I have nothing to tell but my own history, & that is very tedious. I have picked up one very odd correspondent, it is Mr Fox the Minister at Rio (it is the Mr Fox who in one of Lord Byrons letters is said to be so altered after an illness that his *oldest creditors* would not know him). I forgot to thank Susan for her letter of May & Catherine for her pithy message. *We* do not write because Mr Owen does. I must previously have acknowledged your long letter for the foregoing month. We are all here in great anxiety to hear some political news. A ship sailed from Liverpool just after Ld Greys resignation & we cannot guess who will succeed him.



Give my best love to my Father & all of you, & Believe me My very dear Caroline,  
 Yours affectionately  
 Charles Darwin

*Darwin and Beagle* pp. 106-9

[continuation of letter to Henslow begun on July 24th]

October 28th: This letter has been lying in my port-folio ever since July: I did not send it away, because I did not think it worth the postage: it shall now go with a box of specimens: shortly after arriving here, I set out on a geological excursion, & had a very pleasant ramble about the base of the Andes. The whole country appears composed of breccias, (& I imagine Slates) which universally have been modified, & oftentimes completely altered by the action of fire; the varieties of porphyry thus produced is endless, but no where have I yet met with rocks which have flowed in a stream; dykes of greenstone are very numerous: Modern Volcanic action is entirely shut up in the very central parts (which cannot now be reached on account of the snow) of the Cordilleras. To the South of the R. Maypo I examined the Tertiary plains, already partially described by M. Gay. The fossil shells appear to me, to be far more different from the recent ones, than in the great Patagonian formation: it will be curious if an Eocene & Miocene (Recent there is abundance of) could be proved to exist in S. America as well as in Europe. I have been much interested by finding abundance of recent shells at an elevation of 1300 feet; the country in many places is scattered over with shells, but these are *all littoral* ones. So that I suppose the 1300 feet elevation *must* be owing to a succession of small elevations such as in 1822. With these certain proofs of the recent residence of the ocean over all the lower parts of Chili, the outline of every view & the form of each valley possesses a high interest. Has the action of running water or the sea formed this deep ravine? Was a question which often arose in my mind, & generally was answered by finding a bed of recent shells at the bottom. I have not sufficient arguments, but I do not believe that more than a small fraction of the height of the Andes has been formed within the Tertiary period.

The conclusion of my excursion was very unfortunate, I became unwell & could hardly reach this place, I have been in bed for the last month, but am now rapidly getting well. I had hoped during this time to have made a good collection of insects etc but it has been impossible. I regret the less, because Chili fairly swarms with Collectors; there are more Naturalists in the country, than Carpenters or Shoemakers or any other honest trade. In my letter from the Falkland Isd I said I had fears about a box with a Megatherium. I have since heard from B. Ayres, that it went to Liverpool by the Brig Basingwaithe. If you have not received it, it is, I think, worth taking some trouble about. In October two casks & a jar were sent by H.M.S. Samarang via Portsmouth. I have no doubt you have received them. With this letter I send a good many bird skins; in the same box with them, there is a paper parcel, containing pill-boxes with insects: the other pill-boxes require no particular care: you will see in two of these boxes, some dried terrestrial Planariae, the only method I have found of preserving them (they



are exceedingly brittle). By examining the white species I understand some little of the internal structure. There are two small parcels of seeds. There are some plants, which I hope may interest you, or at least those from Patagonia, where I collected everyone in flower. There is a bottle, clumsily, but I think securely corked, containing water and *gaz* from the hot Baths of Cauquenes, seated at foot of Andes & long celebrated for medicinal properties. I took pains in filling & securing both water & gaz – If you can find any one who likes to analyze them; I should think it would be worth the trouble. I have not time at present to copy my few observations about the locality etc etc of these Springs. Will you tell me, how the Arachnidae, which I have sent home, for instance those from Rio, appear to be preserved. I have doubts whether it is worth while collecting them.

We sail the day after tomorrow: our plans are at last limited & definite: I am delighted to say we have bid an eternal adieu to T. del Fuego. The Beagle will not proceed further South than C. Tres Montes. From which point we survey to the North. The Chonos archipelago is delightfully unknown; fine deep inlets running into the Cordilleras, where we can steer by the light of a Volcano. I do not know, which part of the voyage, offers the most attractions. This is a shamefully untidy letter, but you must forgive me & believe me, My dear Henslow

Novr 7th

Yours most truly obliged  
Charles Darwin

*Darwin & Henslow* pp. 91–8

C.D. TO MISS CATHERINE DARWIN

Valparaiso, November 8 1834

My dear Catherine,

My last letter was rather a gloomy one, for I was not very well when I wrote it. Now everything is as bright as sunshine. I am quite well again after being a second time in bed for a fortnight. Captain FitzRoy very generously has delayed the ship for 10 days on my account & without at the time telling me for what reason. We have had some strange proceedings on board the Beagle, but which have ended capitally for all hands. Capt. FitzRoy has for the last two months been working *extremely* hard & at [the] same time constantly annoyed by interruptions from officers of other ships: the selling the Schooner & its consequences were very vexatious: the cold manner the Admiralty (solely I believe because he is a Tory) have treated him & a thousand other &c, &cs has made him very thin & unwell. This was accompanied by a morbid depression of spirits, & a loss of all decision & resolution. The Captain was afraid that his mind was becoming deranged (being aware of his hereditary predisposition). All that Bynoe could say, that it was merely the effect of bodily health & exhaustion after such application, would not do; he invalided & Wickham was appointed to the command. By the instructions Wickham could only finish the survey of the southern part & would then have been obliged to return direct to England. The grief on board the Beagle about the Captain's decision was universal & deeply felt; one great source of his annoyance was the feeling it impossible to fulfil the whole instructions; from his state of



mind it never occurred to him, that the very instructions order him to do as much of [the] West coast *as he has time* for & then proceed across the Pacific. Wickham (very disinterestedly giving up his own promotion) urged this most strongly, stating that when he took the command nothing should induce him to go to T. del Fuego again, & then asked the Captain what would be gained by his resignation. Why not do the more useful part & return as commanded by the Pacific. The Captain, at last, to every one's joy, consented, & the resignation was withdrawn.

Hurra Hurra it is fixed the Beagle shall not go one mile South of C. Tres Montes (about 200 miles South of Chiloe) & from that point to Valparaiso will be finished in about 5 months. We shall examine the Chonos archipelago, entirely unknown, & the curious inland sea behind Chiloe. For me it is glorious. C. T. Montes is the most Southern point where there is much geological interest, as there the modern beds end. The Captain then talks of crossing the Pacific, but I think we shall persuade him to finish the coast of Peru, where the climate is delightful, the country hideously sterile but abounding with the hig[h]est interest to a Geologist. For the first time since leaving England I now see a clear & not so distant prospect of returning to you all: crossing the Pacific & from Sydney home will not take much time.

As soon as the Captain invalided, I at once determined to leave the Beagle; but it was quite absurd, what a revolution in five minutes was effected in all my feelings. I have long been grieved & most sorry at the interminable length of the voyage (although I never would have quitted it); but the minute it was all over, I could not make up my mind to return, I could not give up all the geological castles in the air, which I had been building for the last two years. One whole night I tried to think over the pleasure of seeing Shrewsbury again, but the barren plains of Peru gained the day. I made the following scheme (I know you will abuse me, & perhaps if I had put it in execution my Father would have sent a Mandamus after me): it was to examine the Cordilleras of Chili during this summer, & in the winter go from Port to Port on the coast of Peru to Lima, returning this time next year to Valparaiso, cross the Cordilleras to B. Ayres & take ship to England. Would this not have been a fine excursion & in 16 months I should have been with you all. To have endured T. del F. & not seen the Pacific would have been miserable: As things are at present they are perfect; the intended completion of *small* parts of the survey of [the] S.W. coast would have possessed no interest & the Coast is in fact frightfully dangerous & the climate worse than about C. Horn. When we are once at sea I am sure the Captain will be all right again; he has already regained his cool inflexible manner, which he had quite lost.

I go on board tomorrow; I have been for the last six weeks in Corfield's house. You cannot imagine what a kind friend I have found him. He is universally liked & respected by the Natives & Foreigners. Several Chileno Signoritas are very obligingly anxious to become the Signoras of this house. Tell my Father, I have kept my promise of being extravagant in Chili. I have drawn a bill of 100£ (Had it not better be notified to Mr Robarts & Co?). 50£ goes to the Captain for [the] ensuing year & 30 I take to sea for the small ports; so that bonâ fide I have not spent 180 during these last four months. I hope not to draw another bill for 6





### *Valparaíso*

months. All the foregoing particulars were only settled yesterday: it has done me more good than a pint of Medicine; & I have not been so happy for the last year. If it had not been for my illness, these four months in Chili would have been very pleasant: I have had ill luck however in only one little earthquake having happened. I was lying in bed when there was a party at dinner in the house; on a sudden I heard such a hubbub in the dining room; without a word being spoken, it was devil take the hindmost who should get out first; at the same moment I felt my bed *slightly* vibrate in a lateral direction. The party were old stagers, & heard the noise which always precedes a shock; & no old stager looks at an earthquake with philosophical eyes.

Till you hear again you may direct to Valparaíso. If however it can be managed, far the best & cheapest mode is to get somebody in Liverpool to receive your letters & send them by the first ship which sails for this Port. I shall thus receive them very likely two months earlier than by the ordinary post. In this case they must be directed *to the care of R. Corfield Esq.* I have written to Erasmus (directing Whyndam Club) to ask him to execute for me a commission; if he is not [in] London I daresay Hensleigh Wedgwood would be kind enough to do it, getting the letter to read from the Club.



*Chiloe*

Good bye to you all, you will not have another letter for some time, my dear Catherine.

Yours affectionately,  
Charles Darwin

My best love to my Father & all of you: Love to Nancy.

*Letters* 1 pp.256-9 [in part]; *Darwin and Beagle* pp.109-12

On November 10th the *Beagle* set sail southward once more, in order to complete her survey of the waters around the Island of Chiloe and the Chonos Archipelago. At San Carlos the yawl and a whale-boat were detached under the command of Lieutenant Sullivan to examine the inner coast of Chiloe; Darwin went with them. The *Beagle* herself sailed down the exposed western coast to a rendezvous at the southern tip of Chiloe.

We had a foul wind & a good deal of swell to struggle with, but we reached the Island of S. Pedro, the S.E. extremity of Chiloe, in the evening. When doubling the point of the harbor, Messrs Stuart & Osborne landed to take a round of angles. A fox (of Chiloe, a rare animal) sat on the point & was so absorbed in watching their manœuvres, that he allowed me to walk behind him & actually kill him with my geological hammer. We found the *Beagle* at anchor, she had arrived the day before, & from bad weather had not been able to survey the outer coast of Chiloe. The most singular result of the observations is that Chiloe is made



30 miles too long, hence it will be necessary to shorten the island  $\frac{1}{4}$  of its received size.

DEC. 8th. A party, with Capt. FitzRoy, tried to reach the summit of San Pedro, the highest part of the islands. The woods here have a different aspect from those in the North, there is a much larger proportion of trees with deciduous leaves. The rock also being primitive Micaceous slate, there is no beach, but the steep sides of the hills dip directly down to the sea; the whole appearance is in consequence much more that of T. del Fuego than of Chiloe. In vain we tried to gain the summit; the wood is so intricate that a person who has never seen it will not be able to imagine such a confused mass of dead & dying trunks. I am sure oftentimes for quarter of an hour our feet never touched the ground, being generally from 10 to 20 feet above it; other times, like foxes, one after the other we crept on our hands & knees under the rotten trunks. In the lower parts of the hills, noble trees of Winter's bark, & the *Laurus sassafras*(?) with fragrant leaves, & others the names of which I do not know, were matted together by Bamboos or Canes. Here our party were more like fish struggling in a net than any other animal. On the higher parts brushwood took the place of larger trees, with here & there a red Cypress or an Alerce. I was also much interested by finding our old friend the T. del F. Beech; they were poor stunted little trees, & at an elevation of little less than a 1000 feet. This must be, I should apprehend from their appearance, nearly their Northern limit. We ultimately gave up the ascent in despair.

*Diary* pp.256-7

'Beagle' at sea, November 15th, 1834.

It [Chiloe] will be a pleasant cruise, and all the officers want to go with me. I am to have Osborne, Johnson, and King, the assistant surgeon, and five men, besides the pilot, making a party of ten. We shall have the dinghy with us, so the yawl will be turned into a complete man-of-war. We expect to finish the work as far as Valparaiso by the end of April, when we shall no more return to the south.

NOV. 19th. It was declared yesterday by the doctors that if they were to pick out the most robust and healthy person in the *Beagle* it would be me. However, the cruise in the yawl will, I have no doubt, take me down a little, though I never enjoyed better bodily health than I do in these cruises. Still, the work, fag, and anxiety all tend to keep a person from getting too stout. I am to have six men and one boy; and as the best singers and most diverting characters in the ship are among them – and they are all of that kind, and are up to anything – we shall have, I hope, a very pleasant party. We shall have a large bag full of flour and raisins on purpose for a good plum-dough on Christmas Day.

You cannot think how I have enjoyed the society of Mrs Miller's and Mrs Patterson's little children at Valparaiso. I was their chief friend, and they came to me for everything they wanted. One day I had a large party of ten children on board, the eldest six and the youngest two and a half years old, and for four hours all the big children amused themselves seeing the little ones playing hide-and-seek and other games about the deck.



H.M. 'Beagle's Yawl,' San Carlos, January 9th, 1835.

It rained every day but one for six weeks, and most of the days never ceased raining, but by great good luck we have not had one person unwell.

I shall amuse you with a few stories. For instance, our foraging on a small island inhabited by Indians, on Christmas morning, from nine to twelve, in a heavy gale of wind and tremendous rain, before we could get eggs enough to make our plum-pudding or a sheep to eat. However, we got into the padre's house attached to the church, as our tents, clothes, and blankets were wet through, and by 4 p.m. had one side of a sheep roasted, another side boiled, twelve pounds of English fresh roast beef heated, and two immense plum-puddings made. No bad quantum for twelve men! It would have amused you if you could have seen us in a dirty room with a tremendous fire in the middle, and all our blankets and clothes hung round the top on lines, getting smoked as well as dry, while all hands were busily employed for four hours killing a sheep, picking raisins, beating eggs, mixing puddings which were so large that, in spite of two-thirds of the party being west-country men, we had enough for supper also. However, we passed a pleasant day in spite of wind and weather, and it was a holiday to us, as we could only afford to knock off work when it rained too hard constantly to be able to move, which happened on Christmas Day and New Year's Day. Every other day for eight weeks we were hard at work. It is very curious that I am always in better health in a boat, for I never have enjoyed such perfect good health for two months since leaving England.

[extracts from Lieutenant Sullivan's letters – Sullivan (1896)]

Leaving Sullivan to continue the survey off Chiloe, the *Beagle* spent the next month in the Chonos Archipelago. Darwin found plenty to interest him in both the geology and the zoology of this somewhat unpromising region.

DEC. 29th. Ran along the Coast till we came to an anchor at Yuche Island, a little to the North of the Peninsula of Tres Montes. (30th.) In the morning went on shore; to our great surprise we found the Island well stocked with fine wild Goats. The sportsmen soon killed eight, which have given us two days' fresh meat. I should think these Goats must originally have been turned out by some of the old Spanish Missionary expeditions. Others besides us have visited this place; I found marks of trees long ago cut down, an old fire, & remains of a sort of Shed. I presume it has been one of the prowling tribe of Sealers. In the evening changed our anchorage to a snug cove at the foot of some high hills. (31st.) After breakfast the next morning, a party ascended one of the highest, viz. 2400 ft elevation. The scenery was very remarkable; the chief part of the range is composed of grand solid abrupt masses of granite, which look as if they had been coeval with the very beginning of the world. The granite is capped with slaty gneiss, & this in the lapse of ages has been worn into strange finger-shaped points. These two formations, thus differing in their outlines, agree in being almost destitute of vegetation; & this barrenness had to our eyes a more strange appearance, from being accustomed to the sight of an almost universal forest of dark green trees. I took much delight in examining the structure of these mountains. The complicated &



lofty ranges bore a noble aspect of durability – equally profitless, however, to man & to all other animals. Granite to the Geologist is a classic ground: from its wide-spread limits, its beautiful & compact texture, few rocks have been more anciently recognised. Granite has given rise perhaps to more discussion concerning its origin than any other formation. We see it generally the fundamental rock, & however formed, we know it to be the deepest layer in the crust of this globe, to which man is able to penetrate. The limit of man's knowledge in every subject possesses a high interest, which is perhaps increased by its close neighbourhood to the realms of imagination.

*Diary pp. 260–1*

In all parts of Chiloe and Chonos, two very strange birds occur, which have many points of affinity with the Turco and Tapacolo. One is called by the inhabitants 'Cheucau' (*Pteroptochos rubecula*). It frequents the most gloomy and retired spots within the damp forests. Sometimes, although its cry may be heard close at hand, let a person watch ever so attentively, he will not see the cheucau; at other times, let him stand motionless, and the red-breasted little bird will approach within a few feet, in the most familiar manner. It then busily hops about the entangled mass of rotting canes and branches, with its little tail cocked upwards. I opened the gizzard of some specimens: it was very muscular, and contained hard seeds, buds of plants, and vegetable fibres, mixed with small stones. The cheucau is held in superstitious fear by the Chilotans, on account of its strange and varied cries. There are three very distinct kinds – one is called 'chiduco', and is an omen of good; another, 'huitreu', which is extremely unfavourable; and a third, which I have forgotten. These words are given in imitation of its cries, and the natives are in some things absolutely governed by them. The Chilotans assuredly have chosen a most comical little creature for their prophet.

An allied species, but rather larger, is called by the natives 'Guid-guid' (*Hylactes Tarnii* of King, and *Pteroptochos* of Kittlitz), and by the English the barking-bird. This latter name is well given; for I defy any one at first to feel certain that a small dog is not yelping somewhere in the forest. Just as with the cheucau, a person will sometimes hear the bark close by, but in vain may endeavour, by watching, and with still less chance by beating the bushes, to see its author; yet at other times the guid-guid fearlessly comes near. Its manner of feeding and its general habits are very similar to those of the cheucau. Both species are said to build their nests close to the ground, amongst the rotten branches. The ground being so extremely wet, is a good reason why they do not burrow holes, like the northern species. Besides the cheucau and guid-guid, there is another species, but it is not very common. Moreover, the bird which has been mentioned in Tierra del Fuego, under the title of a black wren (*Scytalopus fuscus* of Gould), appears, in its skulking habits, odd cries, and place of resort, and likewise in some points of structure, to be closely related to this singular genus.

On the coast, a small dusky-coloured bird (a *Furnarius* allied to *fuliginosus*) is very common. It is remarkable from its quiet and very tame habits. It lives entirely on the sea-beach, and there (as well as sometimes on the floating kelp), picks up



*Chiloe*

small sea-shells and crabs; thus supplying the place of a sandpiper. Besides these birds, only a few others inhabit this broken land. In my rough notes I describe the strange noises, which although frequently heard within these gloomy forests, yet scarcely disturb the general silence. The yelping of the guid-guid, and the sudden whew-whew of the cheucau, sometimes come from afar, and sometimes from



close at hand; the little wren occasionally adds its cry; the creeper follows the intruder, screaming and twittering; the humming-bird may be seen every now and then darting from side to side, and emitting, like an insect, its shrill chirp; lastly, from the top of some lofty tree, the indistinct but plaintive note of the white-tufted tyrant-flycatcher may be noticed.

From the great preponderance in most countries of certain kinds of birds, such as the finches, one feels at first surprised at meeting with such peculiar forms, above enumerated, as the commonest birds in any district. In central Chile two of them, namely the *Synallaxis* and *Scytalopus*, occur, although most rarely. When finding, as in this case, any animal which seems to play so insignificant a part in the great scheme of nature, one is apt to wonder why a distinct species should have been created. But it should always be recollected, that in some other country perhaps it is an essential member of society, or at some former period may have been so. If America south of  $37^{\circ}$  should be sunk beneath the waters of the ocean, the *Synallaxis* and *Scytalopus* might continue to exist in central Chile for a long period, but it is very improbable that their numbers would increase. We should then see a case, which must inevitably have happened with very many animals.

*Narrative* 3 pp. 351-4

JAN. 15th. We sailed from Port Low and went to Huafo once more, wishing to give Mr Darwin an opportunity of examining it geologically. There are now no inhabitants on that island, though there are a good many sheep belonging to Chilotes, who live at Caylin. Formerly there were Indians called Huyhuen-che, upon Huafo; but the Spaniards obliged them to quit it, for fear they should give information or supplies to English ships. Near the Beagle, when at anchor, there was a square place, like an entrance to some cave, seemingly cut by man in the soft sand-stone rock; and I have since often reproached myself for having left the place without ascertaining its real nature. It may be the entrance to some cave, formerly used as a burying-place, similar to those explored by Low, and by the surgeon of the Wager.

On the 17th we sailed, and next day anchored off Point Arena, in San Carlos Harbour. Lieutenant Sullivan, with his party, had arrived a few days previously, after a very satisfactory cruise. We found his boats hauled up and refitted, his people lodged under their tents, and himself with Mr Usborne busily occupied in my little observatory, laying down the work for which they had collected materials. Thus we were again assembled in safety, after being considerably divided, and, in consequence, exposed to numerous dangers which human prudence can neither foresee nor prevent. As some soundings were still wanted near the English bank, and about the approach to San Carlos, we employed the 19th in taking them, on board the Beagle, accompanied by her boats, and returned to our usual anchorage, close to Point Arena, at dark.

When sounding on the English bank, we repeatedly tried to ascertain its nature by forcing a very long iron lance downwards as far as possible. The instrument penetrated about two feet into sand in all instances but one, when it was stopped abruptly by a substance which bent the lance and turned its point. It did not,





*Mount Osorno*

however, feel like rock, rather, I should say, like hard wood. This hard place was about a square yard in extent, and all around was sand.

In the night, or rather from two to three the following morning, Osorno was observed in eruption, throwing up brilliant jets of flame or ignited matter, high into the darkness, while lava flowed down its steep sides in torrents, which from our distance (seventy-three miles) looked merely like red lines. Daybreak diminished the effect, and as the light increased only a dark column of smoke could be discerned. This mountain is one of the most striking in form which I ever saw. It is not only quite conical from the base to the summit, but it is so sharply pointed that its appearance is very artificial. When seen from the sea, at a distance of ninety or a hundred miles, the whole of the cone, 6000 feet in height at least, and covered with snow, stands out in the boldest relief from among ranges of inferior mountains. The apex of this cone being very acute, and the cone itself regularly formed, it bears a resemblance to a gigantic glass-house; which similitude is increased not a little by the column of smoke so frequently seen ascending.

We remained till the 4th of February in the port of San Carlos. Mr Darwin profited by the opportunity afforded to make an excursion into the interior of the island, while the surveying party were occupied in arranging data, in laying down chart-work, and in taking and calculating observations.

*Narrative 2 pp. 377-9*





### *Chiloe*

On February 5th the *Beagle* sailed for Valdivia, 150 miles up the coast, where Darwin was able to take a short ride. He was on shore at the time of the great earthquake of February 20th.

FEB. 12th. We continued to ride through the uncleared forest; & only occasionally met an Indian on horseback, or a troop of fine mules bringing Alerce planks or corn from the Southern plains. In the afternoon one of the horses tired; we were then on the brow of a hill which commanded a fine view of the Llanos. The view of these open plains was very refreshing, after being hemmed in & buried amongst the wilderness of trees. The uniformity of a forest soon becomes very wearisome; this West coast makes me remember with pleasure the free, unbounded plains of Patagonia; yet with the true spirit of contradiction, I cannot forget how sublime is the silence of the forest. The Llanos are the most fertile & thickly peopled parts of the country: they possess the immense advantage of being nearly free from trees. Before leaving the forest we crossed some flat little lawns, around which single trees were encroaching in the manner of an English park. It is curious how generally a plain seems hostile to the growth of trees: Humboldt found much difficulty in endeavouring to account for their presence or absence in certain parts of S. America; it appears to me that the levelness of the surface very frequently determines this point; but the cause why it should do so I



cannot guess. In the case of Tierra del Fuego the deficiency is probably owing to the accumulation of too much moisture; but in Banda Oriental, to the North of Maldonado, where we have a fine undulating country, with streams of water (which are themselves fringed with wood) is to me, as I have before stated, the most inexplicable case.

*Diary* p. 273

FEB. 20th. This day has been remarkable in the annals of Valdivia for the most severe earthquake which the oldest inhabitants remember. Some who were at Valparaiso during the dreadful one of 1822, say this was as powerful. I can hardly credit this, & must think that in Earthquakes as in gales of wind, the last is always the worst. I was on shore & lying down in the wood to rest myself. It came on suddenly & lasted two minutes (but appeared much longer). The rocking was most sensible; the undulation appeared both to me & my servant to travel from due East. There was no difficulty in standing upright; but the motion made me giddy. I can compare it to skating on very thin ice or to the motion of a ship in a little cross ripple.

An earthquake like this at once destroys the oldest associations; the world, the very emblem of all that is solid, moves beneath our feet like a crust over a fluid; one second of time conveys to the mind a strange idea of insecurity, which hours of reflection would never create. In the forest, a breeze moved the trees, I felt the earth tremble, but saw no consequence from it. At the town where nearly all the officers were, the scene was more awful; all the houses being built of wood, none actually fell & but few were injured. Every one expected to see the Church a heap of ruins. The houses were shaken violently & creaked much, the nails being partially drawn. I feel sure it is these accompaniments & the horror pictured in the faces of all the inhabitants, which communicates the dread that every one feels who has thus *seen* as well as felt an earthquake. In the forest it was a highly interesting but by no means awe-exciting phenomenon. The effect on the tides was very curious; the great shock took place at the time of low water; an old woman who was on the beach told me that the water flowed quickly but not in big waves to the high-water mark, & as quickly returned to its proper level; this was also evident by the wet sand. She said it flowed like an ordinary tide, only a good deal quicker. This very kind of irregularity in the tide happened two or three years since during an Earthquake at Chiloe & caused a great deal of groundless alarm. In the course of the evening there were other weaker shocks; all of which seemed to produce the most complicated currents, & some of great strength in the Bay. The generally active Volcano of Villa-Rica, which is the only part of the Cordilleras in sight, appeared quite tranquil. I am afraid we shall hear of damage done at Concepcion. I forgot to mention that on board the motion was very perceptible; some below cried out that the ship must have tailed on the shore & was touching the bottom.

21st. We moved our anchorage to one nearer the mouth of the harbor. During the last week there has been an unusual degree of gaiety on board. The Intendente paid us a visit one day & brought a whole boat full of ladies: bad weather



compelled them to stay all night, a sore plague both to us & them. They in return gave a ball, which was attended by nearly all on board. Those who went returned exceedingly well pleased with the people of Valdivia. The Signoritas are pronounced very charming; and what is still more surprising, they have not forgotten how to blush, an art which is at present quite unknown in Chiloe.

*Diary* pp. 277-8

The *Beagle* worked northwards, continuing her survey, and on March 4th reached the port of Concepcion.

Late on the 24th [February] we anchored at Mocha, and the following week was occupied in surveying its shores and the space between them and the mainland. Shocks of earthquakes were frequently felt, more or less severely; sometimes I thought that the anchor had been accidentally let go, and the chain was running out; and while at anchor, I often fancied the ship was driving, till I saw that there was neither swell, current, nor wind sufficient to move her from the anchorage. We naturally concluded that some strange convulsion was working, and anxious for the fate of Concepcion, hastened to Talcahuano Bay as soon as our duty would allow: arriving there on the 4th of March – to our dismay – we saw ruins in every direction.

The following account of this catastrophe was subsequently obtained:

At ten in the morning of the 20th of February, very large flights of sea-fowl were noticed, passing over the city of Concepcion, from the sea-coast, towards the interior: and in the minds of old inhabitants, well acquainted with the climate of Concepcion, some surprise was excited by so unusual and simultaneous a change in the habits of those birds, no signs of an approaching storm being visible, nor any expected at that season. About eleven, the southerly breeze freshened up as usual – the sky was clear, and almost cloudless. At forty minutes after eleven, a shock of an earthquake was felt, slightly at first, but increasing rapidly. During the first half minute, many persons remained in their houses; but then the convulsive moments were so strong, that the alarm became general, and they all rushed into open spaces for safety. The horrid motion increased; people could hardly stand; buildings waved and tottered – suddenly an awful overpowering shock caused universal destruction – and in less than six seconds the city was in ruins. The stunning noise of falling houses; the horrible cracking of the earth, which opened and shut rapidly and repeatedly in numerous places; the desperate heart-rending outcries of the people; the stifling heat; the blinding, smothering clouds of dust; the utter helplessness and confusion; and the extreme horror and alarm, can neither be described nor fully imagined.

This fatal convulsion took place about a minute and a half or two minutes after the first shock; and it lasted for nearly two minutes, with equal violence. During this time no one could stand unsupported; people clung to each other, to trees, or to posts. Some threw themselves on the ground; but there the motion was so violent that they were obliged to stretch out their arms on each side, to prevent being tossed over and over. The poultry flew about screaming wildly. Horses and





*Cathedral at Concepcion after the earthquake*

other animals were greatly frightened, standing with their legs spread out, and their heads down, trembling excessively.

After the most violent shock ceased, the clouds of dust which had been raised by falling buildings, began to disperse; people breathed more freely, and dared to look around them. Ghastly and sepulchral was the sight. Had the graves opened and given up their dead, their appearance could scarcely have been more shocking. Pale and trembling, covered with dust and perspiration, they ran from place to place, calling for relations and friends; and many seemed to be quite bereft of reason.

Considerable shocks continued to harass and alarm at short intervals. The earth was never long quiet during that or the next day, nor indeed for the three days following the great shock; and during many hours after the ruin, it was tremulous, and the shocks were very frequent, though not severe. Many of these, but not all, were preceded by a rumbling, subterranean noise, like distant thunder. Some compared the sound to the distant discharge of many pieces of artillery. These noises came from the south-west quarter, and preceded the shock by one or two seconds; sometimes, but not often, the sound was unaccompanied by any shock.

It was the general opinion that the motion was from south-west to north-east. Some whole walls, whose direction was south-east and north-west, were laid flat, the bricks still maintaining their relative position, though end-wise, without being scattered upon the ground. These walls fell, without exception, to the



north-east. Others were scattered as they fell; but still the greatest masses of brick-work were thrown towards the north-east. Walls standing in the opposite direction, north-east and south-west, suffered far less: none fell bodily or in masses; fragments were shaken or torn off; and some of the walls were very much cracked, but others suffered little. Houses built of 'adobes', became confused heaps, and roofs fell in every where. The cathedral, whose walls were four feet in thickness, supported by great buttresses, and built of good brick and mortar, suffered more than other buildings. Adhering to the remains of the walls were left the lower parts of some buttresses – the upper parts of others – while in one place a buttress stood on its own foundation, separated entirely from the wall.

The city of Concepcion stands upon a plain, very little higher than the level of the river Bio Bio. The soil is loose and alluvial. To the eastward and northward lie rocky irregular hills: from the foot of which the loose earth was every where parted by the great convulsion, large cracks being left, from an inch to more than a foot in width. It seemed as if the low land had been separated from the hills, having been more disturbed by the shock.

Women washing in the river near Concepcion were startled by the sudden rise of the water – from their ankles to their knees – and at the same moment felt the beginning of the convulsion. It was said that the dogs avoided the ruin, by running away before it occurred. This, though known with certainty to have been the case at Talcahuano, wants confirmation with respect to Concepcion. Of nine men who were repairing the inside of a church, seven were killed, and two severely hurt. One of these poor fellows was half-buried in the ruins, during five days, with a dead body lying across him, through which it was necessary to cut, for his release. A mother, escaping with her children, saw one fall into a hole; a wall close to her was tottering; she pushed a piece of wood across the hole, and ran on; the wall fell, covering the hole with masses of brick-work; but, next day, the child was taken out unhurt. Another woman missed a child; saw that a high wall was tottering, but ran for her son, and brought him out. As she crossed the street, the wall fell, but they were safe; when the tremendous crash came, the whole street, which she had just crossed, was filled up with part of the ruins of the cathedral. Besides a waving or undulatory movement, vertical, horizontal, and circular or twisting motions were felt. An angular stone pinnacle was particularly noticed, which had been turned half round, without being thrown down, or leaving its base.

Persons riding at the time of the great shock, were stopped short; some, with their horses, were thrown to the ground: others dismounted, but could not stand. So little was the ground at rest after the great destruction, that between the 20th of February and the 4th of March, more than three hundred shocks were counted.

Much misery was alleviated by the good conduct and extreme hospitality of the inhabitants of Concepcion. Mutual assistance was every where rendered, and theft was almost unknown. The higher classes immediately set people to work, to build straw-covered huts and temporary houses of board, living meanwhile in the open air under trees. Those who soonest obtained or contrived shelter, collected as many about them as they could assist, and in a very few days all had a temporary



shelter, under which they tried to laugh at their misfortunes and the shifts to which they were reduced.

At Talcahuano the great earthquake was felt as severely on the 20th February as in the city of Concepcion. It took place at the same time, and in a precisely similar manner: three houses only, upon a rocky foundation, escaped the fate of all those standing upon the loose sandy soil, which lies between the sea-beach and the hills. Nearly all the inhabitants escaped uninjured; but they had scarcely recovered from the sensations of the ruinous shocks, when an alarm was given that the sea was retiring! Penco was not forgotten; apprehensive of an overwhelming wave, they hurried to the hills as fast as possible.

About half an hour after the shock, when the greater part of the population had reached the heights – the sea having retired so much, that all the vessels at anchor, even those which had been lying in seven fathoms water, were aground, and every rock and shoal in the bay was visible – an enormous wave was seen forcing its way through the western passage which separates Quiriquina Island from the mainland. This terrific swell passed rapidly along the western side of the Bay of Concepcion, sweeping the steep shores of every thing moveable within thirty feet (vertically) from high water-mark. It broke over, dashed along, and whirled about the shipping as if they had been light boats; overflowed the greater part of the town, and then rushed back with such a torrent that every moveable which the earthquake had not buried under heaps of ruins was carried out to sea. In a few minutes, the vessels were again aground, and a second great wave was seen approaching, with more noise and impetuosity than the first; but though this was more powerful, its effects were not so considerable – simply because there was less to destroy. Again the sea fell, dragging away quantities of woodwork and the lighter materials of houses, and leaving the shipping aground.

After some minutes of awful suspense, a third enormous swell was seen between Quiriquina and the mainland, apparently larger than either of the two former. Roaring as it dashed against every obstacle with irresistible force, it rushed – destroying and overwhelming – along the shore. Quickly retiring, as if spurned by the foot of the hills, the retreating wave dragged away such quantities of household effects, fences, furniture, and other moveables, that after the tumultuous rush was over, the sea appeared to be covered with wreck. Earth and water trembled: and exhaustion appeared to follow these mighty efforts.

Numbers of the inhabitants then hastened to the ruins, anxious to ascertain the extent of their losses, and to save some money, or a few valuable articles, which, having escaped the sweep of the sea, were exposed to depredators.

During the remainder of the day, and the following night, the earth was not quiet many minutes at a time. Frequent, almost incessant tremors, occasional shocks more or less severe, and distant subterranean noises, kept every one in anxious suspense. Some thought the crisis had not arrived, and would not descend from the hills into the ruined town. Those who were searching among the ruins, started at every shock, however slight, and almost doubted that the sea was not actually rushing in again to overwhelm them. Nearly all the inhabitants, excepting a few who went on board vessels in the harbour, passed the night upon



the hills, without shelter: and next day they began to raise sheds and huts upon the high grounds, still dreading the sea. It was said, and generally considered certain, that every dog at Talcahuano had left the town before the shock, which ruined the buildings, was felt.

Without explanation it appears astonishing how the shipping escaped destruction. There were three large whale-ships, a bark, two brigs, and a schooner, very near the town, in from four to seven fathoms water: they were lying at single anchor, with a good scope of cable: one only was well moored.

With the southerly breeze, which was rather fresh at the time of the earthquake, these vessels lay to seaward of their anchors, having their sterns towards the sea; and were left aground in this position. The captain of the port, D. Pablo Delano, was on board one of the whale ships at the time, with the hatches battened down, and dead lights shipped. All hands took to the rigging for safety. The first great wave came in an unbroken swell to the stern of the vessel, broke over and lifted her along without doing any material harm, more than sweeping her decks: and the slack chain dragging over the mud checked her gradually, as the first impetus of the wave diminished. Whirling her round, the water rushed out to seaward again, leaving the vessel stranded nearly in her former position. From two fathoms, then aground, the depth alongside increased to ten, as the water rose highest during the last swell. The two latter waves approached, and affected the shipping similarly to the former: all withstood their force, though the light anchors were dragged. Some of the vessels were thrown violently against others; and whirled around as if they had been in the vortex of a whirlpool. Previous to the rush of waters, the *Paulina* and *Orion*, two merchantmen, were lying a full cable's length apart; and after it had passed they were side by side, with three round turns in their cables. Each vessel had therefore gone round the other with each wave: the bow of one was stove in: to the other little damage was done. A small vessel was on the stocks, almost ready for launching; she was carried by the sea two hundred yards in-shore, and left there unhurt. A little schooner, at anchor before the town, slipped her cable, and ran out in the offing as the water fell. She met the wave, unbroken, and rose over it as an ordinary swell. The *Colocolo* was under sail near the eastern entrance of the bay – she likewise met the wave, as a large swell, without inconvenience.

Many boats put off from the shore before the sea retired: some met the advancing waves before they broke, and rose safely over them; others, half swamped, struggled through the breakers. The fate of one little boy was extraordinary. A servant woman had taken refuge with him in a boat; the boat was dashed against an anchor, lying on the shore, and divided. The woman was drowned, but the half of the boat containing the child was carried out into the bay. It floated, and the boy held firmly. He was picked up afterwards, sitting upright, holding steadily with both hands, wet and cold, but unhurt. The boy's name is Hodges: his father is an Englishman, well known at Talcahuano, and was an officer in the British navy.



By a marked part of the wall of Captain Delano's house, it was ascertained that the body of water reached twenty-five feet above the usual level of high water. It penetrated into the 'altos', and left sea-weed hanging to the remains of roofs, or to the tops of broken walls. But this must not be taken as the general height of the wave. A body of water, rushing upon a sloping beach with such force, would naturally preserve its impetus for some time, and run up the inclined plane, to a great height. Those who watched the waves coming in, considered them, while beyond the shipping, about as high as the upper part of the hull of a frigate; or from sixteen to twenty feet above the level of the rest of the water in the bay. Only those parts of the wave which encountered opposition broke, until within half a mile of the beach, when the roar became appalling. Persons who were standing on the heights, overlooking both bays, saw the sea come swelling into San Vicente at the same time that it advanced upon Talcahuano. The explosion in San Vicente, and the sea advancing from both sides, made them think that the peninsula of Tumbes was about to be separated from the main land, and many ran up the hills until they had reached the very highest point.

*Narrative 2* p.411

Besides suffering from the effects of the earthquake and three invading waves, which, coming from the west round both points of the island, united to overflow the low ground near the village, Santa Maria was upheaved nine feet. It appeared that the southern extreme of the island was raised eight feet, the middle nine, and the northern end upwards of ten feet. The Beagle visited this island twice – at the end of March and in the beginning of April: at her first visit it was concluded, from the visible evidence of dead shell-fish, water-marks, and soundings, and from the verbal testimony of the inhabitants, that the land had been raised about eight feet. However, on returning to Concepcion, doubts were raised; and to settle the matter beyond dispute, one of the owners of the island, Don S. Palma, accompanied us the second time. An intelligent Hanoverian, whose occupation upon this island was sealing, and who had lived two years there and knew its shores thoroughly, was also passenger in the Beagle.

When we landed, the Hanoverian, whose name was Anthony Vogelborg, showed me a spot from which he used formerly to gather 'choros', by diving for them at low tide. At dead low water, standing upon the bed of 'choros', and holding his hands up above his head, he could not reach the surface of the water: his height is six feet. On that spot, when I was there, the 'choros' were barely covered at high spring-tide.

Riding round the island afterwards, with Don Salvador and Vogelborg, I took many measures in places where no mistake could be made. On large steep-sided rocks, where vertical measures could be correctly taken, beds of dead muscles were found ten feet above the recent high-water mark. A few inches only above what was then the spring-tide high-water mark, were putrid shell-fish and seaweed, which evidently had not been wetted since the upheaval of the land. One foot lower than the highest bed of muscles, a few limpets and chitons were



adhering to the rock where they had grown. Two feet lower than the same muscles, chitons and limpets were abundant.

An extensive rocky flat lies around the northern parts of Santa Maria. Before the earthquake this was covered by the sea, some projecting rocks only showing themselves: after it, the whole surface was exposed; and square acres (or many quadras) of the rocky flat were covered with dead shell-fish, the stench arising from which was abominable. By this elevation of the land the southern port of Santa Maria was almost destroyed: there remained but little shelter, and very bad landing: the soundings having diminished a fathom and a half every where around the island.

*Narrative 2 pp.413-14*

Although it was indisputably proved to the satisfaction of every person in the neighbourhood, that elevations of land had occurred to the extent mentioned in the previous chapter, I strongly suspect that a sinking down has taken place since that period, to a very considerable amount, if not quite enough to counterbalance former elevation. This idea is suggested by the fact that when I was last at Talcahuano, in July 1835, only four months after the great convulsion, the shores of Concepcion Bay had regained their former position with respect to the level of the sea: by what the people of Tubul told me, when I rode by, of the sea having returned to its centre (meaning that it had regained its usual height), and by what the inhabitants of Santa Maria said, when they told me that for three or four weeks immediately following the earthquake, their little port was much shallower than it was when I went there seven weeks afterwards.

Whether this conjecture be well founded a short time may show: if it should be, an explanation might arise of the differences of opinion respecting the permanent elevation of land near Valparaiso, where some say it has been raised several feet during the last twenty years, while others deny that it has been raised at all. It may have been elevated, or upheaved as geologists say, for a time, but since then it may have settled or sunk down again gradually to its old position. In a place like Valparaiso Bay, where dust is so much blown from the land to the water's edge, and even out to sea; and where many streams bring detritus from ravines, no decisive judgment can be formed as to the rise of land, because of the beach increasing gradually, and the water diminishing in depth.

In a ride along the beach of Concepcion Bay, with Mr Rouse, we examined the solid wall of old Penco Castle, and found on one side the date 1686 and on another 1687.

This castle and the adjoining foundations of houses, are so near the level of the sea, that I am surprised the inhabitants should not have feared being frequently inundated, even by tides only a few feet higher than usual.

If all this coast has been more or less upheaved during comparatively modern times, how is it that the foundations of Penco still stand at the water's edge, very little above the level of a high spring tide?

*Narrative 2 pp.420-1*



With respect to the extent of the earthquake, we know it was severely felt at Valdivia; at Valparaiso they had a sharp shock but it did no damage. All the towns, Talca, Chillan, &c. &c. between Concepcion & St Jago, have been destroyed, till we reach S. Fernando, which has only been partially destroyed. We may imagine the shock at this place & at Valdivia to have had the same degree of force, & on looking at the map, they will be found to be nearly equally distant; hence Concepcion may be supposed to be about the centre of the disturbance. The length of coast which has been *much* affected is rather less than 400 miles. Mr Rous thinks the vibration came from the East, & this would appear probable from the greater number & longest cracks having a N. & S. direction, which line would correspond to the tops of the undulations. The Volcano of Antuco, which is a little to the North of Concepcion is said to be in great activity. The people in Talcuana say that the Earthquake is owing to some old Indian Women two years ago being offended, that they by witchcraft *stopped the Volcano*, & now comes the Earthquake. This silly belief is curious because it shows that experience has taught them the constant relation between the suppressed activity of volcanoes & tremblings of the ground. It is necessary to apply the Witchcraft to the point where their knowledge stops, & this is the closing of the Volcanic Vent.

The town of Concepcion is built, as is usual, with all its streets at rt. angles; one set runs S.W. by W. & N.E. by E. & the other N.W. by N. & S.E. by S. The walls which have the former direction certainly have stood better than those at right angles to them. If, as would seem probable, Antuco may be considered as the centre, it lying rather to the Northward of Concepcion, the concentric lines of undulation would not be far from coincident with N.W. by N. & S.E. by S. walls. This being the case the whole line would be thrown out of its centre of gravity at the same time & would be more likely to fall, than those which presented their ends to the shock. The different resistance offered by the two sets of walls is well seen in the great Church. This fine building stood on one side of the Plaza: it was of considerable size & the walls very thick, 4 to 6 ft., & built entirely of brick: the front which faced the N.E. forms the grandest pile of ruins I ever saw; great masses of brickwork being rolled into the square as fragments of rock are seen at the base of mountains. Neither of the side walls are entirely down, but exceedingly fractured; they are supported by immense buttresses the inutility of which is exemplified by their having been cut off smooth from the wall, as if done by a chisel, whilst the walls themselves remain standing. There must have been a rotatory motion in the earth, for square ornaments placed on the coping of this wall are now seated edgeways. Generally in all parts of the town arched doorways & windows stood pretty well; an old man, however, who was lame had always been in the custom of running to a certain doorway; this time, however, it fell & he was crushed to pieces.

With my idea of a vibration having come from Antuco, the Northward of E., I cannot understand the wave travelling from the South. The cause, however, of an earthquake causing one, two, or three great waves does not to me appear very clear.

The effect of so violent a shock on the springs was of course considerable; some



poured out much more water than usual, some were closed: in one place black hot water flowed from a crack & it is said bubbles of gas & discoloured water were seen rising in the Bay. Many geological reasons have been advanced for supposing that the earth is a mere crust over a fluid melted mass of rock & that Volcanoes are merely apertures through this crust. When a Volcano has been closed for some time, the increased force (whatever its nature may be) which bursts open the orifice, might well cause an undulation in the fluid mass beneath the earth; at each successive ejection of Lava a similar vibration would be felt over the surrounding country; these are known gradually to become less & less frequent, & with them probably the earthquakes, till at last the expansive force is counterbalanced by the pressure in the funnel of the Volcano. Where Earthquakes take place without any volcanic action, we may either imagine that melted rock is injected in the inferior strata, or that an abortive attempt at an eruption has taken place beneath the Volcano. On the supposition of an inferior fluid mass there is no difficulty in understanding that gases, the results of the Chemical action of the great heat, should penetrate upwards through the cracks; or [that] water that had percolated deep near to the regions of fire should by the motion of the earth be forced upwards. Most certainly an earthquake feels very like the motion of a partially elastic body over a fluid in motion. The motion of this Earthquake must have been exceedingly violent; the man at Quiriquina told me the first notice he had of the shock, was finding both his horse & self rolling on the ground. He rose, hardly knowing what it was, & again was thrown down, but not the horse a second time; some of the cattle likewise fell, & some near the edges of the cliffs were rolled into the sea. On one island, at the head of the Bay, the wave drowned 70. The cattle were exceedingly terrified, running about as if mad, with their tails in the air. It is said that light articles lying on the ground, were fairly pitched to & fro. The French Vice Consul mentioned a fact, which if authentic is very curious, that the Dogs generally during an Earthquake howl, as when hearing military music, but that this time they all quietly left the town some minutes before the shock & were standing on the surrounding hills. I believe other such facts are on record. It is also universally stated that on the same morning at 9 o'clock, wonderfully large flocks of gulls & other sea birds were noticed with surprise directing their course inland. I feel doubtful how much credit to give to this statement. I have not forgotten that the inhabitants of Lemuy, when we in the boats arrived there, exclaimed, 'this is the reason we have seen so many parrots lately'.

I have not attempted to give any detailed description of the appearance of Concepcion, for I feel it is quite impossible to convey the mingled feelings with which one beholds this spectacle. Several of the officers visited it before me; but their strongest language failed to communicate a just idea of the desolation. It is a bitter & humiliating thing to see works which have cost men so much time & labour overthrown in one minute; yet compassion for the inhabitants is almost instantly forgotten by the interest excited by finding that state of things produced at a moment of time which one is accustomed to attribute to a succession of ages. To my mind since leaving England we have scarcely beheld any one other sight so



deeply interesting. The Earthquake & Volcano are parts of one of the greatest phenomena to which this world is subject.

*Diary* pp.284-6

C.D. TO MISS CAROLINE DARWIN

[*Beagle*, at sea] March 10th, 1835

My Dear Caroline,

We now are becalmed some leagues off Valparaiso, & instead of growling any longer at our ill fortune, I will begin this letter to you. The first & best news I have to tell is that our voyage has at last a definite & certain end fixed to it. I was beginning to grow quite miserable, & had determined to make a start if the Captain had not come to his conclusion. I do not now care what happens. I know certainly we are on our road to England, although that road is not quite the shortest. On the 1st of June the *Beagle* sails from Valparaiso to Lima, touching only at one intermediate port; from Lima direct to Guayaquil; to the Galapagos, Marquesas, so as to reach Otaheite middle of November, & Sydney end of January of next year.

This letter will be sent across land so will reach England soon: after receiving this you must direct till the middle of November to Sydney; then till the middle of June to the C. of Good Hope. We expect to arrive in England in September 1836. The letters which come to S. America will not be lost, for the Captain will write to the Admiral to forward them to Sydney.

I do so long to see you all again. I am beginning to plan the very coaches by which I shall be able to reach Shrewsbury in the shortest time. The voyage has been grievously too long; we shall hardly know each other again. Independent of these consequences, I continue to suffer so much from sick-sickness, that nothing, not even Geology itself, can make up for the misery & vexation of spirit. But now that I know that I shall see you all again in the glorious month of September, I will care for nothing; the very thoughts of that pleasure shall drive sea-sickness & blue sea devils far away.

We are now on our road from Concepcion. The papers will have told you about the great earthquake of the 20th of February. I suppose it certainly is the worst ever experienced in Chili. It is no use attempting to describe the ruins; it is the most awful spectacle I ever beheld. The town of Concepcion is now nothing more than piles & lines of bricks, tiles & timbers. It is absolutely true there is not one *house* left habitable; some little hovels built of sticks & reeds in the outskirts of the town have not been shaken down, & these now are hired by the richest people. The force of the shock must have been immense, the ground is traversed by rents, the solid rocks are shivered, solid buttresses 6-10 feet thick are broken into fragments like so much biscuit. How fortunate it happened at the time of day when many are out of their houses & all active; if the town had been overthrown in the night, very few would have escaped to tell the tale. We were at Valdivia at the time; the shock there was considered very violent, but did no damage, owing to the houses being built of wood. I am very glad we happened to call at Concepcion so shortly afterwards: it is one of the three most interesting spectacles



I have beheld since leaving England – A Fuegian Savage; Tropical Vegetation; & the ruins of Concepcion. It is indeed most wonderful to witness such desolation produced in those minutes of time.

I wrote a short letter from Chiloe, but forget at what date. We had a remarkably pleasant boat expedition along the Eastern coast. I am afraid it will be the last cruize of this sort. You cannot imagine what merry work such a wandering journey is; in the morning we never know where we shall sleep at night. Carrying, like snails, our houses with us, we are always independent. When the day is over we sit round our fire, & pity all you who are confined within houses.

I joined the Ship at the South extremity, & proceeded with her amongst the Chonos Is & Tres Montes. There was a good deal of rough water; & the Geology not very interesting, but upon the whole this cruize has been a very fair one. Chiloe I have seen throughly, having gone round it & crossed it on horseback in two directions. I am tired of the restraint of those gloomy forests of the South, & shall enjoy the open country of Chili & Peru. Valdivia is a quiet little hamlet, just like those in Chiloe. We had an opportunity of seeing many of the famous tribe of Araucanian Indians; the only men in the Americas who have successfully withstood for centuries the conquering arms of the Europaeans. During this cruize we have had the misfortune to loose 4 anchors; this is the cause of our now proceeding to Valparaiso; with only one anchor at the bows it would not be safe to survey the coast. The Beagle will immediately return to Concepcion, from there resume the survey & continue to Coquimbo. Then she will return to Valparaiso, take in provisions, & start for Lima. I shall leave the Ship for the present, & not join her till the beginning of June; the Captain most kindly has offered to run into Coquimbo to pick me up on his way up the coast to Lima. I hope & trust it will not be too late to cross the Cordilleras; besides the interest of such a journey, I am most anxious to see a geological section of this grand range. Two days after we get in port, I will be off to St Jago & cross the Andes by the bad pass, see Mendoza, & return by the common one. I am much afraid of this cloudy weather; if snow falls early I may be detained a prisoner on the other side! I shall be obliged to spend a good deal of money, but I can most conscientiously say I never spend a dollar without thinking whether it is worth it. I am sure my Father will not grudge me a little more money than usual; for this is the last journey I shall be able [to] take on shore, anyhow before we reach Sydney. Oh the precious money wasted in Cambridge. I am ashamed to think of it.

I am very glad of this spell on shore; my stomach, partly from sea-sickness & partly from my illness in Valparaiso, is not very strong. I expect some good rides will make another man of me. And now our Voyage for many months will be in fine warm weather & the fair trade wind. Again I shall see Palms & eat Bananas, & I look forward with pleasure to the very buzzing of the Mosquitos. The Captain is quite himself again, & thank Heavens, as anxious to reach dear old England as all the rest of us. The interval appears nothing; I can almost fancy we are running up the chops of the Channel, & the lookout man has just hailed the 'Lizard lights right ahead, Sir'. There will be more men aloft that day than on the deck.

*Valparaiso* 13th. I am in all the delightful hurry of a quick march: tomorrow



morning at four o'clock I start for St Jago. I am yet very doubtful about the Andes, but hope for the best; a pretty thing if the snow falls whilst I am in Mendoza! In that case I should have to beg my way up to Potosi. I am now in Corfield's house, who is as hospitable & kind as he always is. Tell my Father I have drawn a bill for sixty pounds.

When we arrived the day before yesterday, I only received two letters, (both most full of interesting news) from Katty September, & Caroline October. The June, July, August ones have miscarried. I expect, however, they are in the Commodore's ships, & Commodores are fully privileged to forget the entire concern of a ten gun Brig; others are sufferers with me. I am very sorry for this, because I actually suppose that Erasmus has written, & it will indeed be hard if I lose this. Also it seems poor William Owen has badly hurt his leg. I wish they had not met this fate. You allude to some of the fossil bones being of value, & this of course is the very best news to me which I can hear. See how much obliged I am to all of you for your faithful performance of the promise of monthly letters. I might have been more than a year without hearing: it is now 10 months.

God bless you all, for the best Sisters anyone ever had.

I cannot write more, for horse-cloths, stirrups, pistols & spurs are lying on all sides of me. Give my most affectionate love to my dear Father.

Farewell,  
Chas Darwin

*Darwin and Beagle* pp. 112-16

C.D. TO PROFESSOR HENSLOW

[*Beagle*, at sea] March 1835

My dear Henslow

We now are lying becalmed off Valparaiso, & I will take the opportunity of writing a few lines to you. The termination of our voyage is at last decided on – we leave the coast of America in the beginning of September & hope to reach England in the same month of 1836. I am heartily glad of it, nothing should induce me to stay out any longer. As it is, it will be nearly as long as a seven years transportation. But now that I do clearly see England in the distance, I care for nothing, not even sea sickness. In October perhaps I shall be in Cambridge & who knows but taking a walk with you round by Shelford common. You can hardly understand how I long to see you & all my friends again; & now there only wants a year & half to that time. We shall see a great many places in this interval, but I am afraid there will be but little opportunities for Natural History.

We are now making a passage from Concepcion. You will have heard an account of the dreadful earthquake of the 20th of February. I wish some of the Geologists who think the Earthquakes of their times are trifling could see the way the solid rock is shivered. In the town there is not one house habitable; the ruins remind me of the drawings of the desolated Eastern cities. We were at Baldivia at the time & felt the shock very severely. The sensation is more like that of skating over very thin ice; that is, distinct undulations were perceptible. The whole scene of Concepcion & Talcuana is one of the most interesting spectacles we have beheld since leaving England.



Since leaving Valparaiso, during this cruize, I have done little excepting in Geology. In the modern Tertiary strata, I have examined 4 bands of disturbance, which reminded me on a small scale of the famous tract in the Isle of Wight. In one spot there were beautiful examples of 3 different forms of upheaval. In two cases I think I can show, that the inclination is owing to the presence of a system of parallel dykes traversing the inferior Mica Slate. The whole of the coast from Chiloe to S. extreme of the Pen: of Tres Montes is composed of the latter rock; it is traversed by very numerous dykes, the mineralogical nature of which will I suspect turn out very curious. I examined one grand transverse chain of Granite, which has clearly burst up through the overlying Slate. At P. Tres Montes there has been an old Volcanic focus, which corresponds to another in the North part of Chiloe. I was much pleased at Chiloe by finding a thick bed of recent Oysters shells, etc, capping the Tertiary plain, out of which grew large forest trees. I can now prove that both sides of the Andes have risen in the recent period, to a considerable height. Here the shells were 350 ft above the sea.

In Zoology I have done but very little; excepting a large collection of minute Diptera & Hymenoptera from Chiloe. I took in one day, *Pselaphus*, *Anaspis*, *Latridius*, *Leiodes*, *Cercyon* & *Elmis* & two beautiful true Carabi; I might almost have fancied myself collecting in England. A new & pretty genus of Nudibranch Mollusc: which cannot crawl on a flat surface: & a genus in the family of *Balanidae*, which has not a true case, but lives in minute cavities of the shells of the *Concholopas*, are nearly the only two novelties. You were surprised at hearing of land *Planariae*; you will equally be so, when you see leaches, which live entirely out of water in the forests of Chiloe & Valdivia.

Before the Beagle sails for Lima, I shall be obliged to send away one more box: this will be the last, with which I shall trouble you. I am afraid so many boxes must have been very much in your way. I trust they may turn out worth their stowage. I will write again, when this last Cargo is sent. You ought to have received about a month since 2 boxes by H.M.S. Challenger & before that 2 Casks & one jar by H.M.S. Samarang. Will you write to me directed to Sydney, not long after receiving this letter. I am very unreasonable in begging for so many letters; but bear with me for one year more. If any come directed in the mean time to S. America, they will be forwarded to Sydney by the Admiral.

Valparaiso March 13th. I am on the point of starting to endeavour to pass the Cordilleras, but am very doubtful of the issue. Three month's letters are somewhere mislaid: but I hope they will be found. Perhaps there may be a letter from you. I am anxious to know whether the bird skins from the River Plate in a tin box came safe. I think that collection will be good, as I took much pains with them. I am in a great hurry, so excuse this stupid, shabby little letter. Oh the goodly month of September 1836. To think I shall again be actually living quietly in Cambridge. It is too good a prospect, it will spoil the Cordilleras. So my dear Henslow good night

Your most obliged & affectionate friend  
Chas Darwin



After a series of mishaps, the *Beagle* was left with only one heavy anchor, and on March 11th arrived back in Valparaiso to obtain more. The ship then returned to complete the survey of the coast south of Concepcion, while Darwin stayed behind to make another long ride, across the Andes from Santiago to Mendoza and back.

MARCH 20th. As we ascended the valley the vegetation became exceedingly scanty; there were, however, a few very pretty Alpine plants. Scarcely a bird or insect was to be seen. The lofty mountains, their summits marked with a few patches of snow, stood well separated one from the other. The valleys are filled up with an enormous thickness of Alluvium. In the scenery of the Andes, the parts which strike me as contrasted with the few other mountain chains which I have seen, are – the flatness of the valleys, the narrow plain being composed of shingle, through which the river cuts a channel. Geological reasons induce me to believe that this gravel &c. was deposited by the ocean when it occupied these ravines, & that the agency of the rivers is solely to remove such rubbish. If such be the case the elevation of the Andes, being posterior to most other mountains, accounts for these fringes still remaining attached to the sides of the valleys. Again – the bright colors, chiefly red & purple, of the utterly bare & steep hills – the great & continuous wall-like dykes – the manifest stratification, which, where nearly vertical, causes the wildest & most picturesque groups of peaks, where little inclined, we have massive unbroken mountains; these latter occupy the outskirts of the Cordilleras, as the others do the more central & lofty parts. And lastly – the vast piles of fine & generally bright colored detritus; these decline from the sides of the mountains at a high angle into the bottom of the valley. These smooth & unbroken conical piles must often have an elevation of 2000 ft.

I have often noticed that where snow lies long on the ground, the stones seem very apt to crumble, and in the Cordilleras, *Rain* never falls. Hence the quantity of degraded rock. It occasionally happens that in the Spring, a quantity of such rubbish falls over the drift snow at the base of the hills; & so forms for many years a natural Ice-house. We rode over one of these: the elevation is far beneath the line of perpetual snow. During the day, in a very desert & exposed part of the valley, we passed the remains of some Indian houses; I shall have occasion to mention this subject again. As the evening was drawing on, we reached the Valle del Yeso. This is a very singular basin which must once have been a large lake. The barrier is formed by what deserves the name of a mountain of Alluvium, on one side of which the river has cut a gorge. The plain is covered by some dry pasture, & we had the agreeable prospect of herds of cattle. The valley is called Yeso, from a great bed, I should think nearly 2000 ft thick, of white, & in many parts quite pure, Gypsum. We slept with a party of men who were employed in loading mules with this substance & who had come up for the cattle.

21st. We began our march early in the day; we followed the course of the river, which by this time was small, till we arrived at the foot of the ridge which separates the waters which flow into the Pacific & Atlantic Oceans. Until now our road had been good & the ascent steady, but very gradual; now commenced the steep zigzag track. The Cordilleras in this pass consist of two principal ridges, each of which must be about 12,000 ft high; the first called Puquenes forms the



division of the waters & hence of the Republics of Chili & Mendoza; to the East of this we meet an undulating track, with a gentle fall, & then the second line of the Portillo; through this, some way to the South, the intermediate waters have a passage.

We began the tedious ascent, & first experienced some little difficulty in the respiration. The mules would halt every fifty yards & then the poor willing animals would, after a few seconds, of their own accord start again. The short breathing from the rarified air, is called by the Chilenos 'Puna'; they have most ridiculous ideas respecting its nature; some say, 'all the waters here have Puna', others that, 'where there is snow there is Puna', and which no doubt is true. It is considered a sort of disease, & I was shown the crosses of several graves where people had died 'Punado'. I cannot believe this, without perhaps a person suffering from some organic disease of the Chest or Heart: or very likely any one dying from whatever cause would have unusual difficulty in breathing. The only sensation I experienced was a slight tightness over the head & chest; a feeling which may be known by leaving a warm room & running violently on a frosty day. There was a good deal of fancy even in this, for upon finding fossil shells on the highest ridge, in my delight I entirely forgot the 'Puna'. Certainly the labor of walking is excessive, & the breathing deep & difficult; & it is nearly incomprehensible to me how Humboldt (& others subsequently) have reached 19,000 ft. No doubt a residence of some months in Quito, 10,000 ft high, would prepare the constitution for such an exertion. Yet in Potosi, strangers, I am told, suffer for about a year.

When about halfway up, we met a large party of seventy loaded mules & passengers; it was a pretty sight to see the long string descending, & hear the wild cries of the Muleteers; they looked so diminutive; no bushes, nothing but the bleak mountains with which to compare them. Near the summit the wind, as is almost always the case, was violent & very cold; on each side of the ridge we had to pass over broad bands of Snow, which is perpetually there, & now would soon be covered by a fresh layer. I there first observed the substance described by the Arctic navigators as Red snow. Subsequently I found under the microscope, it consists of groups of minute red balls, the diameter of which is  $\frac{1}{1000}$ th of an inch, & having several envelopes. The snow was only tinged where crushed by the mules' hoofs & where the thaw had been rapid. When we reached the crest & looked backwards, a glorious view was presented. The atmosphere so resplendently clear, the sky an intense blue, the profound valleys, the wild broken forms, the heaps of ruins piled up during the lapse of ages, the bright colored rocks, contrasted with the quiet mountains of Snow, together produced a scene I never could have imagined. Neither plant or bird, excepting a few condors wheeling around the higher pinnacles, distracted the attention from the inanimate mass. I felt glad I was by myself, it was like watching a thunderstorm, or hearing in the full orchestra a chorus of the Messiah.

We descended into the intermediate district & took up our quarters for the night: the elevation cannot be much short of 10,000 ft, in consequence the vegetation is very scanty & there are no bushes; the roots of a certain plant which



are thick, serve for bad fuel. It was piercingly cold, & I having a headache went to bed. During the night the sky suddenly became clouded; I awakened the Arriero to know if there was any danger, but he told me, without thunder & lightning, there is no risk of a bad Snow storm. The peril is imminent, & the difficulty of subsequent escape great, to a person caught in a heavy storm between the two Cordilleras. There is only one place of shelter, a cave, where Mr Caldcleugh, who crossed on the very same day of the month, took refuge for some time. From this cause, the Portillo pass in the Autumn, is so much more dangerous than the other one, where there are Casuchas built.

Under the diminished pressure, of course water boils at a lower temperature; in consequence of this the potatoes after boiling for some hours were as hard as ever; the pot was left on the fire all night, but yet the potatoes were not softened. I found out this, by overhearing in the morning my companions discussing the cause; they came to the simple conclusion that 'the cursed pot (which was a new one) did not choose to boil potatoes'.

*Diary* pp.290-3

MARCH 23rd. The descent is much shorter & therefore steeper than that on the other side; that is, the Cordilleras rise more abruptly from the plains, than from the Alpine country of Chili. At some depth beneath our feet there was extended a level & brilliantly white sea of clouds which shut out from our view the equally level Pampas. We soon entered the band of clouds & did not again emerge from them. At one o'clock, finding pasture & bushes for firewood at a spot called Los Arenales, we stopped there for the night. This is nearly the uppermost limit of bushes. I should apprehend the elevation to be about 7000 ft. I was surprised at the general difference of the vegetation in the valleys on this side & those of the other; & still more so with the close identity in the greater part of all the living productions with Patagonia. I recognised here many of the thorny bushes & plants which are common on those sterile plains, & with them we have the same birds & peculiar insects. It has always been a subject of regret to me that we were unavoidably compelled to give up the ascent of the S. Cruz river before reaching the mountains. I always had a latent hope of meeting with some great change in the features of the country; I now feel sure, it would only have been pursuing the plains of Patagonia up an ascent.

*Diary* p.295

The account of the same day in the *Narrative* incorporates some significant additions.

MARCH 23d. The descent on the eastern side of the Cordillera is much shorter or steeper than on the Pacific side; in other words, the mountains rise more abruptly from the plains, than from the alpine country of Chile. A level and brilliantly white sea of clouds was extended beneath our feet, and thus shut out the view of the equally level Pampas. We soon entered the band of clouds, and did not again emerge from it that day. About noon, finding pasture for the animals and bushes for firewood, in a part of the valley called Los Arenales, we stopped for the night.



This was near the uppermost limit of bushes, and the elevation, I suppose, was between seven and eight thousand feet.

I was very much struck with the marked difference between the vegetation of these eastern valleys and that of the opposite side: yet the climate, as well as the kind of soil, is nearly identical, and the difference of longitude very trifling. The same remark holds good with the quadrupeds, and in a lesser degree with the birds and insects. We must except certain species which habitually or occasionally frequent elevated mountains; and in the case of the birds, certain kinds, which have a range as far south as the Strait of Magellan. This fact is in perfect accordance with the geological history of the Andes; for these mountains have existed as a great barrier, since a period so remote that whole races of animals must subsequently have perished from the face of the earth. Therefore, unless we suppose the same species to have been created in two different countries, we ought not to expect any closer similarity between the organic beings on opposite sides of the Andes, than on shores separated by a broad strait of the sea. In both cases we must leave out of the question those kinds which have been able to cross the barrier, whether of salt water or solid rock.<sup>1</sup>

A great number of the plants and animals were absolutely the same, or most closely allied with those of Patagonia. We here have the agouti, bizcacha, three species of armadillo, the ostrich, certain kinds of partridges, and other birds, none of which are ever seen in Chile, but are the characteristic animals of the desert plains of Patagonia. We have likewise many of the same (to the eyes of a person who is not a botanist) thorny stunted bushes, withered grass, and dwarf plants. Even the black slowly-crawling beetles are closely similar, and some, I believe, on rigorous examination, absolutely identical. It had always been a subject of regret to me, that we were unavoidably compelled to give up the ascent of the St. Cruz river before reaching the mountains. I always had a latent hope of meeting with some great change in the features of the country; but I now feel sure, that it would only have been following the plains of Patagonia up an ascent.

*Narrative* 3 pp. 399-400

MARCH 25th. I was reminded of the Pampas of Buenos Ayres by seeing the disc of the rising sun intersected by an horizon level as that of the ocean. During the night a heavy dew had fallen, a thing we did not experience within the Cordillera. The road proceeded for some distance due East across a low swamp, then meeting with the dry plain it turned up North to Mendoza. The distance is two very long days' journey. Our first day was called fourteen leagues to Estacado, & second (26th) seventeen to Luxan, near Mendoza. The whole is a level, sterile plain, with only two or three houses; we scarcely met a single person. The sun was exceedingly powerful & the ride devoid of all interest. There is very little water in the Traversia; in the whole of the second day there was only one little pool. The small streams which flow from the mountains are dried up, or rather absorbed

<sup>1</sup>This is merely an illustration of the admirable laws first laid down by Mr Lyell of the geographical distribution of animals as influenced by geological changes. The whole reasoning, of course, is founded on the assumption of the immutability of species. Otherwise the changes might be considered as superinduced by different circumstances in the two regions during a length of time.



before they reach this distance, although we generally were only from 10–15 miles from the first range. The ground is in many parts encrusted by a saline efflorescence, hence we see the same salt-loving plants which are so common near B. Blanca. As I have already remarked respecting the Eastern valleys, there is in this Traversia also a great resemblance to the plains of Patagonia. There is one character of landscape from the Sts of Magellan to some distance North of B. Blanca; it would appear that this kind of country extends in a sweeping line to about S. Luis de la Punta, & that to the East of this is the basin of the damp & green plains of B. Ayres. The dry & sterile Traversia of Mendoza & Patagonia is a formation of pebbles, worn smooth & deposited by a former sea; whilst the Cienegas, or plains of grass, is a deposition of fine mud from a former aestuary of the Plata, which was then bounded by a coast, the line of which is pointed out by the two sorts of country. The Zoology of these plains is also similar to those near the Atlantic; we have here the Ostrich, Guanaco, Agouti or Hare, Bizcatcha, some Foxes, Lions, the four species of Armadillo; the same sorts of Partridges, Carrion hawks, Butcher birds, &c. &c.

After our tedious day's ride, it was refreshing to see in the distance the rows of Poplars & Willow trees & green gardens around the village of Luxan. Shortly before arriving at this place, we saw to the South a large ragged cloud of a dark reddish brown color. For some time we were convinced that it was heavy smoke from a large fire in the Pampas; it afterward turned out to be a Pest of Locusts. They were travelling due North with a light breeze & overtook us, I should think, at the rate of 10–15 miles an hour. The main body reached from 20 to perhaps 2000 to 3000 ft above the ground. The noise of their approach was that of a strong breeze passing through the rigging of a Ship. The sky seen through the advanced guard appeared like a Mezzotinto engraving, but the main body was impervious to sight; they were not however so thick, but what they could escape from the waving backwards & forwards of a stick. When they alighted they were more numerous than the leaves in a field & changed the green into a reddish colour: the swarm having once alighted the individuals flew from side to side in any direction. This is not an uncommon pest in this country; already during the season several smaller swarms had come up from the sterile plains of the South & many trees had been entirely stripped of their leaves. Of course this swarm cannot even be compared [to] those of the Eastern world, yet it was sufficient to make the well known descriptions of their ravages more intelligible. I have omitted perhaps the most striking part of [the] scene, namely the vain attempts of the poor cottagers to turn the stream aside; many lighted fires, & with the smoke, shouts, & waving of branches, endeavoured to avert the attack.

We crossed the river of Luxan; this is a considerable body of water, its course, however, toward the sea coast is but very imperfectly known. They either are dried up in the plains or form the R. Sauce & R. Colorado. We slept in the village; it is a small place, 5 leagues South of Mendoza, & is the S. limit of the fertile territory of that Province. At night I experienced an attack, & it deserves no less a name, of the Benchuca, the great black bug of the Pampas. It is most disgusting to feel soft wingless insects, about an inch long, crawling over one's body; before



sucking they are quite thin, but afterwards round & bloated with blood, & in this state they are easily squashed. They are also found in the Northern part of Chili & in Peru: one which I caught at Iquiqui was very empty; being placed on the table & though surrounded by people, if a finger was presented, its sucker was withdrawn, & the bold insect began to draw blood. It was curious to watch the change in the size of the insect's body in less than ten minutes. There was no pain felt. This one meal kept the insect fat for four months; in a fortnight, however, it was ready, if allowed, to suck more blood.

27th. We rode on to Mendoza; the country was beautifully cultivated & resembled Chili. From the number of houses it was almost one straggling village; the whole is celebrated for its fruit, & certainly nothing could appear more flourishing than the orchards of Figs, peaches, vines & olives. We bought water melons nearly twice as large as a man's head, most deliciously cool & well flavoured, for a halfpenny apiece; & for a Medio (3d.), half a wheelbarrowful of Peaches.

The cultivated & enclosed part of the province of Mendoza is very small: being chiefly what lies between Luxan & the capital. Beyond this we have a plain such as we have seen, more or less sterile; where there is water there is pasture for cattle. The cultivated land, as in Chili, owes its fertility to artificial irrigation; & it really is wonderful, when one reflects how wonderfully productive an utterly barren Traversia can be made by this simple process. The inhabitants have the reckless lounging manners of the Pampas, as also the same dress, riding-gear, &c. &c. They appear, however, a dirty drunken race of mixed Indian & Negro blood.

*Diary* pp.296-8

APRIL 5th. From the Rio de las Vacas to the Puente del Incas, half a day's journey; here was a little pasture for the mules, & some interesting geology for me, so we bivouaced for the night. When one hears of a Natural bridge, one pictures to oneself some deep & narrow ravine across which a bold mass of rock has fallen, or a great archway excavated. Instead of all this the Incas' bridge is a miserable object. The bottom of the valley is nearly even & composed of a mass of Alluvium; on one side are several hot mineral springs, & these have deposited over the pebbles a considerable thickness of hard stratified Tufa. The river running in a narrow channel, scooped out an archway beneath the hard Tufa; soil & stones falling down from the opposite side at last met the over hanging part & formed the bridge. The oblique junction of the stratified rock & a confused mass is very distinct & this latter is different from the general character of the plain. This Incas' bridge is truly a sight not worth seeing.

Near to this place are some ruins of Indian buildings; they consist now merely of the vestiges of walls; I saw such in several other stations; the most perfect were the Ruinas del Tambillos. The rooms were small & square & many huddled together in distinct groups; some of the doorways yet stood, these were formed of a cross slab of stone & very low, not more than 3 ft high. The whole were capable of containing a good many people. Tradition says they were the halting places for the Incas when they crossed the Cordilleras, & these Monarchs would probably



travel with a large Retinue. The situation of Tambillo is utterly desert & that of the Puente only a shade better. Traces of Indian buildings are common all over the Cordilleras; those mentioned in the Portillo pass probably were not only used as lodging houses in the passage; because if so, there would have been others, & the situation is by no means central. Yet the Valley is now quite useless & destitute of vegetation. In the ravine of Jajuel near Aconcagua, I frequently heard of numerous remains situated at a great elevation, & of course both cold & sterile; there is no pass in that part. I, at this time, imagined these might have been places of refuge on the first arrival of the Spaniards. Subsequently what I have seen has led me almost to suspect there has been a change of Climate in these latitudes. In very many places, indeed in all the ravines in the Cordilleras of Copiapò, remains of Indian houses are found; in these they find bits of woollen articles, instruments of precious metals, Indian corn, & I had in my possession the head of an arrow made of Agate, of precisely the same figure as those in T. del Fuego. It is the opinion of the people of the country that the Indians resided in these houses. Now, I am assured by men who have passed their lives in travelling the Andes, that these ruins are found at the greatest elevations, almost on the limit of perpetual snow, in places where there are no passes, where the ground produces nothing, & what is more extraordinary, where there is no water. In the 'Despoblado' (uninhabited) valley near Copiapò at a spot called Punta Gorda, I saw the remains of seven or eight square little rooms; they were of a similar form with those at Tambillos but chiefly built of mud instead of stone; & which mud the people of the country cannot imitate in hardness: there was no water nearer than 3 or four leagues & this only in small quantity & bad. The valley is utterly desert. These houses are placed in the most conspicuous spot in a broad flat valley & in a defenceless position; they could not therefore have been places of refuge. Even with the advantage of beasts of burden, a mine could only be worked here at great expense; yet former Indians chose it out as a place of residence. A person who has never seen such countries will not readily understand how entirely unfit they are for human habitations. If however a few showers were to fall annually, in the place of one in several years, so as to make a small rill of water, by irrigation such spots would be highly fertile. All these facts strongly incline me to suspect that some change for the worse has taken place, since the period when the ruins were inhabited.

I have certain proof that the S. part of the continent of S. America has been elevated from 4 to 500 feet within the epoch of the existence of such shells as are now found on the coasts. It may possibly have been much more on the sea-coast & probably more in the Cordilleras. If the Andes were lowered till they formed (perhaps 3-4000 ft) a mere peninsula with outlying Islands, would not the climate probably be more like that of the S. Sea Islands, than its present parched nature? At a remote Geological aera, I can show that this grand chain consisted of Volcanic Islands, covered with luxuriant forests; some of the trees, one of 15 feet in circumference, I have seen silicified & imbedded in marine strata. If the mountains rose slowly, the change of climate would also deteriorate slowly; I know of no reason for denying that a large part of this may have taken place since



S. America was peopled. We need not be surprised at the remains of stone & hardened mud walls lasting for so many ages as I imagine; it will be well to call to mind how many centuries the Druidical mounds have withstood even the climate of England. I may also remark that the above conjecture explains the *present* elevation of the ruins; I am aware that the Peruvian Indians choose stations so lofty, that a stranger is affected with Puna, but I am assured there are 'muchissimas' houses where during the whole long winter snow lies. Surely no people would found a village under such circumstances. When at Lima I was conversing with a civil engineer, Mr Gill, about the number of Indian ruins & quantity of ground thrown out of cultivation in that Province, & he told me that the conjecture about a change of climate had sometimes crossed his mind; but generally he thought that the present sterility, where there was formerly cultivation, was chiefly owing to neglect or subterranean movements injuring the Conduits or subterranean passages, which the Indians had formed on so wonderful a scale, to bring water for the purposes of irrigation. As an illustration he told me one very curious fact, that travelling from Casma to Huaraz he found a plain covered with ruins &c. &c. & now quite bare; near to it was the dry course of a considerable river; in its bed there were pebbles & sand, & in one spot solid rock to the depth of 8 feet & about 40 yards wide, had been cut through. From its appearance he could not tell that the river had not followed this line within a few years; but upon following up the course for a short distance, to his astonishment he found it going down hill; that is the bed of the river was arched. This could, of course, only happen after some subterranean movement, which would throw the water back on itself until some new lateral line of drainage was opened. The inhabited plain from that year would necessarily be deserted.

*Diary* pp. 301-4

C.D. TO PROFESSOR HENSLOW

Valparaiso April 18th-1835.

My dear Henslow.

I have just returned from Mendoza, having crossed the Cordilleras by two passes. This trip has added much to my knowledge of the geology of the country. Some of the facts, of the truth of which I in my own mind feel fully convinced, will (I fear) appear to you quite absurd & incredible. I will give a very short sketch of the structure of these huge mountains. In the Portillo pass (the more Southern one) travellers have described the Cordilleras to consist of a double chain of nearly equal altitude, separated by a considerable interval. This is the case: & the same structure extends to the Northward to Uspallata; the little elevation of the Eastern line (here not more than 6000-7000 ft), has caused it almost to be overlooked. To begin with the Western & principal chain; we have where the sections are best seen, an enormous mass of Porphyritic conglomerate resting on Granite. This latter rock seems to form the nucleus of the whole mass & is seen in the deep lateral valleys, injected amongst, upheaving, overturning in the most extraordinary manner the overlying strata. On the bare sides of the mountains, the complicated dykes & wedges of variously coloured rocks are seen traversing in



every possible form & shape the same formations, which by their intersections prove a succession of violences. The stratification in all the mountains is beautifully distinct & from a variety in the color can be seen at great distances. I cannot imagine any part of the world presenting a more extraordinary scene of the breaking up of the crust of the globe than the very central peaks of the Andes. The upheaval has taken place by a great number of (nearly) N & S lines; which in most cases has formed as many anticlinal & synclinal ravines: The strata in the highest pinnacles are almost universally inclined at an angle from  $70^{\circ}$ – $80^{\circ}$ .

I cannot tell you how I enjoyed some of these views – it is worth coming from England once to feel such intense delight. At an elevation from 10–12,000 ft there is a transparency in the air & a confusion of distances & a sort of stillness which gives the sensation of being in another world; & when to this is joined, the picture so plainly drawn of the great epochs of violence, it causes in the mind a most strange assemblage of ideas. The formation I call Porph-Conglomerates, is the most important & most developed one in Chili; from a great number of sections, I find it a true coarse Conglomerate or Breccia, which by every step in a slow gradation passes into a fine Clay-stone Porphyry; the pebbles & cement becoming Porphyritic, till at last all is blended in one compact rock. The Porphyries are excessively abundant in this chain, I feel sure at least four of them have been thus produced from sedimentary beds in situ. There are Porphyries which have been *injected* from below amongst strata & others ejected which have flowed in streams: it is remarkable. I could show specimens of this rock, produced in these three methods, *which cannot be distinguished*. It is a great mistake considering the Cordilleras (here) as composed of rocks which have flowed in streams: in this range I *no* where saw a fragment, which I believe to have thus originated, although the road passes at no great distance from the active Volcanoes. The Porphyries, Conglomerates, Sandstones & Quartzose Sandstones, Limestones, alternate & pass into each other many times (overlying where not broken through by the Granite, Clay-Slate). In the upper parts, the Sandstone begins to alternate with Gypsum, till at last we have this substance of a stupendous thickness. I really think the formation is in some places (it varies much) nearly 2000 ft thick: it occurs often with a green (Epidote?) siliceous Sandstone & snow white marbles: it resembles that found in the Alps in containing large concretions of a crystalline marble of a blackish grey color. The upper beds, which form some of the higher pinnacles consist of layers of snow white gypsum & red compact sandstone, from the thickness of paper to a few feet, alternating in an endless round. The rock has a most curiously painted appearance.

At the pass of the Puquenas in this formation, where however a black rock, like Clay-Slate, without many laminae occurring with a pale Limestone has replaced the red Sandstone I found abundant impressions of shells. The elevation must be between 12–13,000 ft. A shell which I believe is a *Gryphaea* is the most abundant; an *Ostraea*, *Turritella*, *Ammonites*, small *Bivalves*, *Terebratula* (?). *Perhaps* some good Conchologist will be able to give a guess, to what grand division of the formations of Europe, these organic remains bear most resemblance. They are exceedingly imperfect & few. The *Gryphites* are most perfect. It was *late* in the



Season, & the situation particularly dangerous for snow storms. I did not dare to delay, otherwise a grand harvest might have been reaped.

So much for the Western line; in the Portillo pass, proceeding Eastward we meet an immense mass of a Conglomerate dipping to the West  $45^\circ$ , which rests on Micaceous Sandstones etc etc, upheaved, converted into quartz rock, penetrated by dykes, from the very grand mass of *Protogine* (large crystals of quartz, red Feldspar & occasional little Chlorite). Now this Conglomerate, which reposes on & dips from the Protogine  $\angle 45^\circ$ , consists of the peculiar rocks of the first described chain, pebbles of the black rock *with shells*, green sandstone etc etc: It is hence manifest that the *upheaval* (& deposition at least of part) of the Grand Eastern chain is entirely posterior to the Western. To the North in the Uspallata pass we have also a fact of the same class. Bear this in mind, it will help to make you believe what follows. I have said the Uspallata range is geologically, although only 6000–7000 ft, a continuation of the grand Eastern chain. It has its nucleus of granite, consists of grand beds of various crystalline rocks, which I can feel no doubt are subaqueous lavas alternating with Sandstone, Conglomerates, & white Aluminous beds (like decomposed feldspar) with many other curious varieties of sedimentary deposits. These Lavas & Sandstones *alternate* very many times & are quite conformable one to another. During two days of careful examination I said to myself at least 50 times: how exactly like, only rather harder, these beds are to those of the upper Tertiary strata of Patagonia, Chiloe, Concepcion, without the possible identity *ever* having occurred to me. At last there was no resisting the conclusion. I could not expect shells for they never occur in this formation; but Lignite or Carbonaceous shale ought to be found. I had previously been exceedingly puzzled by meeting in the Sandstone, thin layers (few inches to feet thick) of a brecciated Pitchstone. I strongly suspect the alteration, from the underlying Granite, has altered such beds into this Pitchstone.

The silicified wood (particularly characteristic) was yet absent; the conviction that I was on the Tertiary Strata was so strong, by this time in my mind, that on the third day, in the midst of Lavas, & heaps of Granite I began my apparently forlorn hunt. How do you think I succeeded? In an escarpment of compact greenish Sandstone I found a small wood of petrified trees in a vertical position, or rather the strata were inclined about  $20^\circ$ – $30^\circ$  to one point & the trees  $70^\circ$  to the opposite one. That is they were before the tilt truly vertical. The Sandstone consists of *many* layers & is marked by the concentric lines of the bark (I have specimens) 11 are perfectly silicified, & resemble the dicotyledenous wood which I have found at Chiloe & Concepcion: the others, 30–40, I only know to be trees from the analogy of form & position; they consist of snow white columns, Like Lots wife of coarsely crystall. Carb. of Lime. The longest shaft is 7 feet. They are all close together within a 100 yds & about same level; no where else could I find any. It cannot be doubted that the *layers* of fine Sandstone have quietly been deposited between a clump of trees, which were fixed by their roots. The Sandstone rests on Lavas, is covered by [a] great bed, apparently about 1000 ft thick, of black Augitic Lava, & over this, there are at least 5 grand alternations of such rocks & aqueous sedimentary deposits; amounting in thickness to several thousand feet.



I am quite afraid of the only conclusion which I can draw from this fact; namely that there must have been a depression in the surface of the land to that amount. But neglecting this consideration it was a most satisfactory support of my presumption of the Tertiary (I mean by Tertiary, that the shells of the period were closely allied or some identical to those which now live as in lower beds of Patagonia) age of this Eastern Chain. A great part of the proof must remain upon my ipse dixit, of a mineralogical resemblance with those beds whose age is known, & the character of which resemblance is to be subject to infinite variation, passing from one variety to others by a concretionary structure. I hardly expect you to believe me, when it is a consequence of this view that Granite which forms peaks of a height probably of 14,000 ft has been fluid in the Tertiary period; that strata of that period are altered by its heat & are traversed by *dykes* from the mass: that these Strata have also probably undergone an immense depression, that they are now inclined at high angles & form regular & complicated anticlinal lines. To complete the climax & seal your disbelief these same sedimentary Strata & Lavas are traversed by very numerous true metallic veins of Iron, Copper, Arsenic, Silver & Gold, & that these can be traced to the underlying Granite. A Gold mine has been worked close to the clump of silicified trees.

If when you see my specimens, sections & account, you should think that there is pretty strong presumptive evidence of the above facts: It appears very important; for the structure, & size of this chain will bear comparison with any in the world. And that this all should have been produced in so very recent a period is indeed wonderful. In my own mind I am quite convinced of the reality of this. I can anyhow most conscientiously say, that no previously formed conjecture warped my judgement. As I have described, so did I actually observe the facts. But I will have some mercy & end this most lengthy account of my geological trip.

On some of the large patches of perpetual snow I found the famous Red Snow of the Arctic countries. I send with this letter my observations & a piece of Paper, on which I tried to dry some specimens. If the fact is new & you think it worth while, either yourself examine them or send them to whoever has described the specimens from the North, & publish a notice in any of the periodicals. I also send a bottle with 2 Lizards: one of them is Viviparous, as you will see by the accompanying notice – A M. Gay, a French Naturalist has already published in one of the Newspapers of this country a similar statement, & probably has forwarded to Paris some account: as the fact appears singular, would it not be worth while to hand over the Specimens to some good Lizardologist & Comparative Anatomist to publish an account of their internal structure. Do what you think fit.

This letter will go with a cargo of Specimens from Coquimbo. I shall write to let you know when they are sent off. In the Box, there are two Bags of Seeds, one ticket[ed], Valleys of Cordilleras 5000–10,000 ft high; the soil & climate exceedingly dry; soil very light & stony, extremes in temperature: the other chiefly from the dry sandy Traversia of Mendoza 3000 ft more or less. If some of



the bushes should grow but not be healthy, try a *slight* sprinkling of Salt & Saltpetre. The plain is saliferous. All the flowers in the Cordilleras appear to be Autumnal flowers. They were all in blow & seed – many of them very pretty. I gathered them as I rode along on the hill sides: if they will but choose to come up, I have no doubt many would be great rarities. In the Mendoza Bag, there are the seeds or berrys of what appears to be a small Potatoe plant with a whitish flower. They grow many leagues from where any habitation could ever have existed, owing to absence of water. Amongst the Chonos dried plants, you will see a fine specimen of the wild Potatoe, growing under a most opposite climate & unquestionably a true wild Potatoe. It must be a distinct species from that of the lower Cordilleras etc. Perhaps, as with the Banana, distinct species are now not to be distinguished in their varieties, produced by cultivation. The Beagle is not at Valparaiso. So I cannot copy out the few remarks about the Chonos Potatoe. With the Specimens, there is a bundle of old Papers & Note Books. Will you take care of them, in case I should lose my notes, these might be useful. I do not send home any insects, because they must be troublesome to you, & now so little more of the Voyage remains unfinished I can well take charge of them.

In two or three days I set out for Coquimbo by land, the Beagle calls for me in the middle of June: So that I have 6 weeks more to enjoy geologizing over these curious mountains of Chili. There is at present a bloody revolution in Peru: the Commodore has gone there & in the hurry has carried our letters with him; perhaps amongst them there will be one from you. I wish I had the old Commodore here I would shake some consideration for others into his old body. From Coquimbo you will again hear from me. Till then Farewell. My dear Henslow

Yours very truly,  
C. Darwin

Our plans are altered. I have a ten weeks holiday & expect to reach as far as Copiapo & examine all that preeminently curious country abounding with mines: I shall not write to you, till we reach [*blank left unfilled*] excepting half a dozen lines just to inform you when my specimens leave this Port. I am glad to say, that I believe this will be the last Cargo with which you will be troubled.

*Darwin & Henslow* pp. 102–9

C.D. TO MISS SUSAN DARWIN

Valparaiso April 23d 1835

My dear Susan,

I received a few days since your letter of November: the three letters which I before mentioned are yet missing, But I do not doubt they will come to life.

I returned a week ago from my excursion across the Andes to Mendoza. Since leaving England I have never made so successful a journey; it has, however, been very expensive. I am sure my Father would not regret it, if he could know how deeply I have enjoyed it. It was something more than enjoyment: I cannot express the delight which I felt at such a famous winding up of all my Geology in S. America. I literally could hardly sleep at nights for thinking over my day's work.



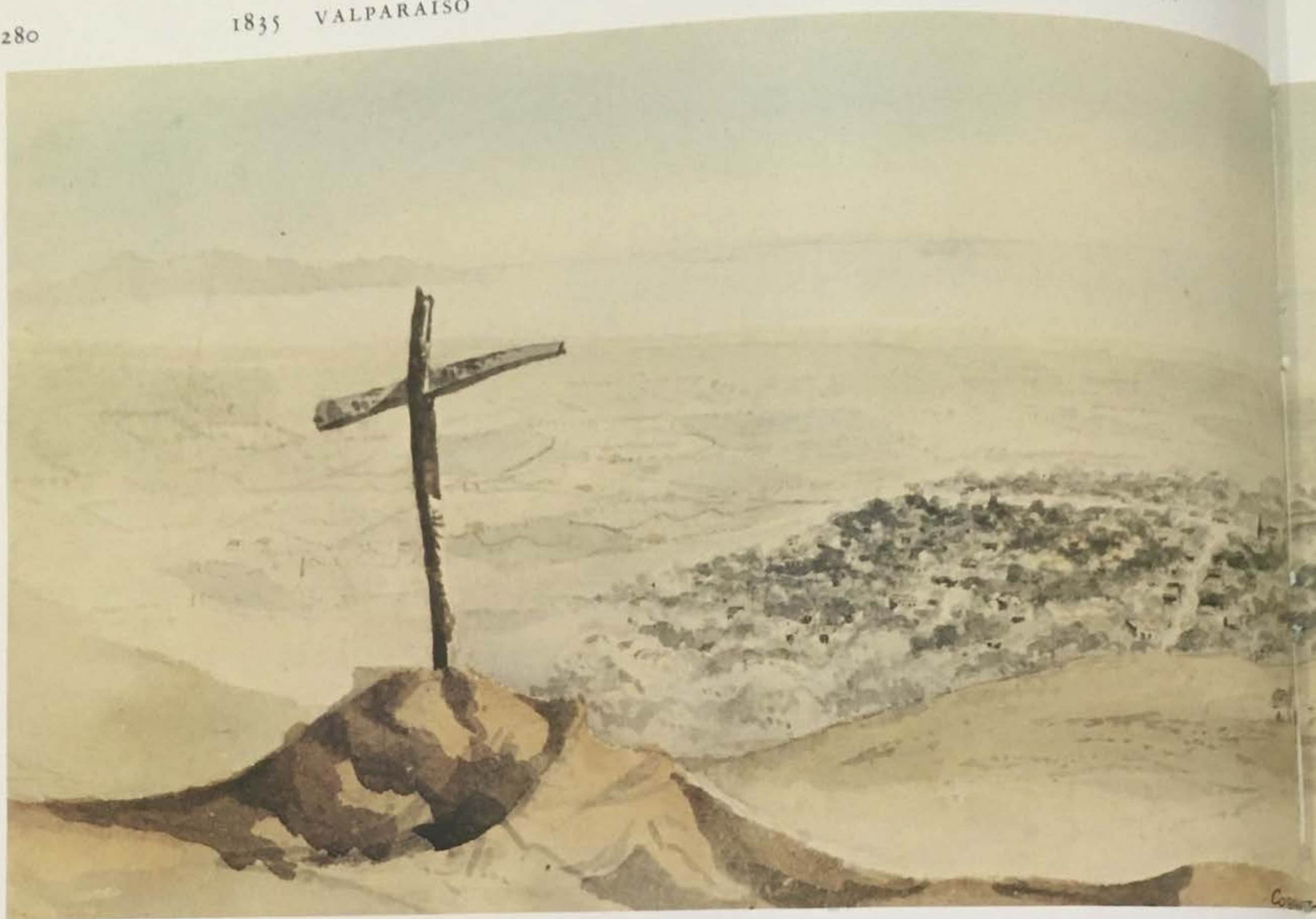
The scenery was so new & so majestic; everything at an elevation of 12,000 ft bears so different an aspect from that in a lower country. I have seen many views more beautiful, but none with so strongly marked a character. To a geologist also there are such manifest proofs of excessive violence; the strata of the highest pinnacles are tossed about like the crust of a broken pie. I crossed by the Portillo Pass, which at this time of year is apt to be dangerous, so could not afford to delay there. After staying a day in the stupid town of Mendoza, I began my return by Uspallata, which I did very leisurely. My whole trip only took up 22 days. I travelled with – for me – uncommon comfort, as I carried a *bed*! My party consisted of two Peons & ten mules, two of which were with baggage or rather food, in case of being snowed up. Everything however favoured me, not even a speck of this year's snow had fallen on the road.

I do not suppose any of you can be much interested in Geological details, but I will just mention my principal results. Beside understanding to a certain extent, the description & manner of the force which has elevated this great line of mountains, I can clearly demonstrate that one part of the double line is of an age long posterior to the other. In the more ancient line, which is the true chain of the Andes, I can describe the sort & order of the rocks which compose it. These are chiefly remarkable by containing a bed of Gypsum nearly 2000 ft thick: a quantity of this substance I should think unparalleled in the world. What is of much greater consequence, I have procured fossil shells (from an elevation of 12,000 ft). I think an examination of these will give an approximate age to these mountains as compared to the Strata of Europe. In the other line of the Cordillera there is a strong presumption (in my own mind conviction), that the enormous mass of mountains, the peaks of which rise to 13 & 14,000 ft, are so very modern as to be contemporaneous with the plains of Patagonia (or about with *upper* Strata of Isle of Wight). If this result shall be considered as proved, it is a very important fact in the theory of the formation of the world. Because if such wonderful changes have taken place so recently in the crust of the globe, there can be no reason for supposing former epochs of excessive violence. These modern Strata are very remarkable by being threaded with metallic veins of Silver, Gold, Copper, etc.; hitherto these have been considered as appertaining to older formations. In these same beds (& close to a Gold mine) I found a clump of petrified trees, standing upright, with the layers of fine Sandstone deposited round them, bearing the impression of their bark. These trees are covered by other sandstones & streams of Lava to the thickness of several thousand feet. These rocks have been deposited beneath water, yet it is clear the spot where the trees grew must once have been above the level of the sea, so that it is certain the land must have been depressed by at least as many thousand feet, as the superincumbent subaqueous deposits are thick.

But I am afraid you will tell me I am prosy with my Geological descriptions & theories.

You are aware that plants of Arctic regions are frequently found in lower latitudes, at an elevation which produces an equal degree of cold. I noticed a rather curious illustration of this law in finding on the patches of perpetual Snow,



*Coquimbo*

the famous Red Snow of the Northern Navigators. I am going to send to Henslow a description of this little Lichen, for him, if he thinks it worth while, to publish in some of the Periodicals. I am getting ready my last Cargo of specimens to send to England. This last trip has added half a mule's load, for without plenty of proof, I do not expect a word of what I have above written to be believed.

I arrived at this place a week since, & am as before living with Corfield. I have found him as kind & good-natured a friend as he is a good man. I staid also a week in St Jago, to rest after the Cordilleras, of which I stood in need, & lived in the house of Mr Caldcleugh (the author of some bad travels in S. America); he is a very pleasant person, & took an infinite degree of trouble for me. It is quite surprising how kind & hospitable I have found all the English merchants. Do mention to Mr Corfield of Pitchford, under what obligations I lie to his son.

Amongst the various pieces of news of which your letter is full, I am indeed very sorry to hear of poor Col. Leighton's death. I can well believe how much he is regretted. It is a bitter reflection when I think what changes will have taken place before I return. I pray to Heaven I may return to see all of you.

When you write to the West Indies or Madeira, remember me most





affectionately to Charlotte. I hope she will be happy there. When I enjoyed talking over all my schemes with her, how little did she expect to be so soon under a vertical sun & glowing atmosphere. I am surprised at any Husband liking to take his wife to such a country.

The Beagle after leaving me here, returned to Concepcion. Capt. FitzRoy has investigated with admirable precision the relative position of land & water since the great Earthquake. The rise is unequal, & parts of the coast are now settling down again, probably at each little trembling, which yet continue. The Isle of S. Maria has been elevated 10 feet; Capt. FitzRoy found a bed of Muscles with putrid fish that many feet above high water mark.

The Beagle passed this port yesterday. I hired a boat & pulled out to her. The Capt. is very well; I was the first to communicate to him his promotion. He is fully determined nothing shall induce him to delay the voyage a month; if time is lost in one place, something else shall be sacrificed. Our voyage now will solely consist in carrying a chain of longitudes between important positions.

My holidays extend till the middle of July, so that I have 10 weeks before me, & the Beagle will pick me up at any Port I choose. The day after tomorrow I start for



Coquimbo. I have three horses & a baggage mule, & a Peon whom I can trust, having now accompanied me on every excursion. The people moreover to the *North*, have a capital character for honesty, i.e. they are not cut-throats. The weather there also will not be hot & it never rains. I shall extend my journey to Copiapò; it is a great distance, but I feel certain I shall be most amply repaid. Everything which can interest a Geologist is found in those districts. Mines of Rock-salt, Gypsum, Saltpetre, Sulphur; the rocks threaded with metallic veins; old sea-beaches; curious formed valleys; petrified shells; Volcanoes & strange scenery. The country geologically is entirely unknown (as indeed is the whole of south S. America), & I thus shall see the whole of Chili from the Desert of Atacama to the extreme point of Chiloe.

All this is very brilliant, but now comes the black & dismal part of the Prospect – that horrid phantom Money. The country where I am going to is very thinly inhabited, & it will be impossible to draw bills. I am therefore obliged to draw the money here & transmit it there. Moreover it is necessary to be prepared for accidents: horses stolen; I robbed; Peon sick – a pretty state I should be [in,] 400 or 500 miles from where I could command money. In short I have drawn a bill for £100-0-0, & this so shortly after having spent 60 in crossing the Andes. In September we leave the coast of America; & my Father will believe that I *will* not draw money in crossing the Pacific, because I *can* not, I verily believe I could spend money in the very moon. My travelling expences are nothing; but when I reach a point as Coquimbo, whilst my horses are resting, I hear of something very wonderful 100 miles off. A muleteer offers to take me for so many dollars, & I cannot, or rather never have, resisted the Temptation.

My Father's patience must be exhausted; it will be patience smiling at his son, instead of at grief. I write about it as a good joke, but upon my honor I do not consider it so. Corfield cashes the bill & sends it to his Father, who will bring it to the old Bank, where I suppose it can be transacted.

I received a long & affectionate letter from Fox; he alludes to a letter which I have never received. I shall write to him from Lima; at present I have my hands full. How strange it sounds to hear him talk of 'his dear little wife'. Thank providence he did not marry the simple charming Bessy. I shall be very curious to hear a verdict concerning the merits of the Lady. How the world goes round; Eyton married, I hope he will teach his wife to sit upright. I have written to him; I am sure he deserves to be happy. What are the two younger sons doing? I think from what I saw at Cambridge, Tom is worth the pair.

Your account of Erasmus' (does Erasmus live with the Hensleighs; for the last year their names have never in any letter been separated?) visit to Cambridge has made me long to be back there. I cannot fancy anything more delightful than his Sunday round of King's, Trinity & those talking giants, Whewell & Sedgwick. I hope your musical tastes continue in due force. I shall be ravenous for the Pianoforte. Do you recollect, poor old Granny, how I used to torment your quiet soul every evening? I have not quite determined whether I will sleep at the Lion, the first night when I arrive per Wonder, or disturb you all in the dead of the night; everything short of that is absolutely planned. Everything about



Shrewsbury is growing in my mind bigger & more beautiful; I am certain the Acacia & Copper Beech are two superb trees; I shall know every bush, & I will trouble you young ladies, when each of you cut down your tree, to spare a few. As for the view behind the house, I have seen nothing like it. It is the same with North Wales; Snowden to my mind, looks much higher & much more beautiful than any peak in the Cordilleras. So you will say, with my benighted faculties, it is time to return, & so it is, & I long to be with you. Whatever the trees are, I know what I shall find all you. I am writing nonsense, so Farewell. My most affectionate love to all, & I pray forgiveness from my Father.

Yours most affectionately,  
Charles Darwin.

You send my letters to Marianne, so I do not send my particular love to her. I suppose her young gentlemen will be a small troop of Grenadiers by the time I return. What a gang of little ones have come into the world since I left England.

*Letters* 1 pp.259-62 [in part]; *Darwin and Beagle* pp.116-21

Darwin arrived back in Valparaiso on April 17th. A week later the *Beagle* called in, having completed the survey of the coast to the south, but stayed only long enough to arrange for a rendezvous at Coquimbo, before proceeding northwards. On April 27th, Darwin set off on the last of his long rides, 500 miles up the coast to Copiapó.

MAY 3rd. Quilimar to Conchalee. The Country becomes more & more barren; the valleys have so little water, that there is scarcely any irrigation; of course the intermediate country is quite useless, & will not even support goats. In the Spring after the winter rains there is a rapid growth of thin pasture, & cattle are then brought down from the Cordilleras to graze. It is rather curious the manner in which the Vegetation *knows* how much rain to expect; one shower at Copiapó produces an equal effect with a couple at Guasco & 3 or 4 at Coquimbo, whilst at Valparaiso torrents of rain fall. Travelling North from the latter place, the quantity does not decrease in a regular proportion to the distances. At Conchalee which is not half-way between Valparaiso & Coquimbo (being only 67 miles to the North of the former) they do not expect rain till end of May, whereas at Valparaiso generally early in April; the quantity likewise which falls is proportionally small to the later time it comes.

I heard of the *Beagle* surveying all these ports; all the inhabitants were convinced she was a Smuggler, they complained of the entire want of confidence the Captain showed in not coming to any terms; each man thought his neighbour was in the secret: I had even difficulty in undeceiving them. By the way, this anecdote about the smuggling shows how little even the upper classes in these countries understand the wide distinction of manners. A person who could possibly mistake Capt. FitzRoy for a smuggler, would never perceive any difference between a Lord Chesterfield & his valet.

*Diary* pp.307-8



Darwin reached Coquimbo on May 14th, and took lodgings in the town with FitzRoy, for all the crew of the *Beagle* were living on shore while the ship underwent a thorough refit before her passage home across the Pacific. He spent a fortnight exploring the countryside, and wrote a letter home.

MAY 19th. I walked a little way up the valley & saw those step-like plains of shingle described by Capt. B. Hall, the origin of which has been discussed by Mr Lyell. The same phenomenon is found in the valley of Guasco in a more evident manner; in places there [are] as many as seven perfectly level & unequally broad plains, ascending by steps on one or both sides the valley. There can be no doubt that during the rise of the land, each line of cliff was for a period the beach of a large bay. At Coquimbo marine shells were embedded in strata near the surface; independent of this proof, the explanation of the successive breaking down of the barrier of a lake, adduced by Capt. Hall, is quite inapplicable. The appearance of these steps, especially in Guasco, is sufficiently remarkable to call the attention of any one who is not at all interested concerning the causes of the present forms of the land. The number of parallel & horizontal lines, of which many have exactly corresponding ones on the opposite side of the valley, is rendered more conspicuous by the irregular outline of the neighbouring mountains.

*Diary* p. 313

C.D. TO MISS CATHERINE DARWIN

May 31st. Coquimbo 1835

My dear Catherine

I have very little to write about; but as there will not be another opportunity for some time to send a letter, I will give an account of myself since leaving Valparaiso. My journey up here was rather tedious; I was obliged to travel so very slowly, that my animals might remain in good condition for the rest of the journey. The country is very miserable; so burnt up & dry, that the mountains are as bare as turn-pike roads, with the exception of the great Cacti, covered with spines. I visited very many mines: & since I have been here, I have made an excursion up the valley to see some famous ones of Silver. I reached the foot of the Cordilleras. The geology goes on very prosperously; before I leave Chili, I shall have a very good general idea of its structure. The day after tomorrow, I start for Copiapò, passing through Guasco: on the 5th of July the *Beagle* calls for me at that place; from whence to Iquique & Lima. This latter part of my journey will be still less interesting than the former, as I understand nearly all the road is a desert. There is one Traversia of a day & half without a drop of water. I shall be very glad, when once again settled on board the *Beagle*. I am tired of this eternal rambling, without any rest. Oh what a delightful reflection it is, that we are now on our road to England.

My method of travelling is very independent & in this respect as pleasant as possible. I take my bed & a kettle, & a pot, a plate & basin. We buy food & cook for ourselves, always bivouacking in the open air, at some little distance from the house, where we buy Corn or grass for the horses. It is impossible to sleep in the



houses, on account of the fleas. Before I was fully aware of this, I have risen in the morning, with my whole shirt punctured with little spots of blood, the skin of my body is quite freckled with their bites. I never formerly had any idea, what a torment, in these hot, dry climates, these ravenous little wretches could be. But gracias a dios one month more & farewell for ever to Chili; in two months more farewell South America.

I have lately been reading about the South Sea – I begin to suspect, there will not be much to see; that is, after any one group with its inhabitants, has been visited. Everyone however must feel some curiosity to behold Otaheite – I am lucky in having plenty of occupation for the Sea part, in writing up my journal & Geological memoranda. I have already got two books of rough notes. The Beagle is now in the Port, refitting before our long voyage: Everybody is living on shore in tents. Everything has been taken out of her even to the ballast. She proceeds in a week's time to Valparaiso for 9 months provisions. I hope some vessel of war will come round, before she sails; if not, I shall not receive any other letter from you for the next 9 months, that is till we reach Sydney. From Valparaiso I send a large cargo of specimens to Henslow: & these will be the last, for the rest I shall be able to carry, more especially as every month, my wardrobe becomes less & less bulky. By the time we reach England, I shall scarcely have a coat to my back. And at present, as you may see, I have scarcely an idea in my head – So – Farewell

Your affectionate Brother

Chas Darwin

*Darwin and Beagle* pp. 121–3

On June 2nd, Darwin rode out of Coquimbo on the final leg of his journey. After making a considerable detour into the foothills of the Andes, he reached Copiapò on July 1st.

To return to the valley of Copiapò. Finding little of interest in this part of the ravine, we retraced our steps to the house of Don Benito, where I staid two days collecting fossil shells and silicified wood. The latter was present in the most extraordinary quantity: it was here that I found a cylindrical trunk, fifteen feet in circumference, projecting from the side of a hill. It was amusing to hear discussions concerning the nature of the fossil shells – whether or not they had been thus 'born by nature' – carried on almost in the same terms as were used a century before in Europe. My geological examination of the country generally created a good deal of surprise amongst the Chilenos: it was long before they would be convinced that I was not hunting for mines. This was sometimes troublesome. I found the most ready way of explaining my employment, was to ask them how it was that they themselves were not curious concerning earthquakes and volcanoes? why some springs were hot and others cold? why there were mountains in Chile, and not a hill in La Plata? These bare questions at once satisfied and silenced the greater number; some, however (like a few in England who are a century behindhand), thought that all such inquiries were



useless and impious; and that it was quite sufficient that God had thus made the mountains.

An order had recently been issued that all stray dogs should be killed, and we saw many carcasses lying on the high road. A great number had lately been affected with hydrophobia, and several men had been bitten, and had died in consequence. On other occasions hydrophobia has prevailed in this valley. It is remarkable thus to find so strange and dreadful a disease appearing time after time in the same isolated spot. It has been remarked that certain villages in England are in like manner much more subject to this visitation than others. Hydrophobia must be extremely rare on the eastern side of the Andes, for Azara thought it was unknown in America; and Ulloa says the same with respect to Quito. I could not hear of a case having occurred in Van Diemen's Land, or in Australia; and Burchell says, during the five years he was at the Cape of Good Hope, he never heard of an instance of it. Webster again asserts that at the Azores, hydrophobia has never occurred; and the same observation has been made with respect to Mauritius and St Helena. In so strange a disease, some information might possibly be gained by considering the circumstances under which it originates in distant climates.

*Narrative* 3 pp.435-6

JULY 4th. Set out for the Port, which is called 18 leagues distant. I slept at a cottage beyond the halfway. There is very little cultivation below the town; the valley expands & is covered with a wretched coarse kind of grass, which scarcely any animal will touch. The soil *appears* both rich & damp; its poorness in productive powers must be owing to the abundance of saline matter; in some spots there are layers several inches thick of white & pure Salts, which consist chiefly of the Carbonate & Sulphate of Soda. The whole line of road is only inhabited in a few places. (5th.) We reached the port at Noon. It is a miserable little assemblage of a few houses, situated at the foot of some sterile plains & hills. At present, from the river reaching the sea, they enjoy the advantage of fresh water within a mile & a half. On the beach there were large piles of merchandize & the little place had an air of bustle & activity. I found the Beagle had arrived on the 3rd. Capt. FitzRoy was not on board: at Valparaiso he joined the Blonde to assist as Pilot in taking off the coast of Chili, South of Concepcion, the crew of H.M.S. Challenger, which had there been wrecked. I felt very glad to be again on board the Beagle. In the evening I gave my 'adios' with a hearty goodwill to my companion, Mariano Gonzales, with whom I had ridden so many leagues in Chili.

*Diary* pp.325-6

The *Beagle* sailed from Copiapò on July 6th, and after calling briefly at Iquique, anchored at Callao, the port of Lima, on July 19th. Darwin wrote several letters, and paid a brief visit to the Peruvian capital.

JULY 19th. In the night anchored in the outer part of the harbor of Gallao. Our passage was a short one owing to the steady trade wind. Rolling steadily onwards



with our studding sails on each side, I was reminded of the Atlantic. But there is a great difference in the interest of the two passages. In the latter there is an ever varying & beautiful sky; the brilliant day is relieved by a cool refreshing evening & the cloudless sky is glorious. The ocean teems with life, no one can watch the Flying-fish, Dolphin & Porpoises without pleasure. At night in the clear Heavens, the European traveller views the new Constellations which foretell the new countries to which the good ship is onward driving. Here in the Pacific, although the water is never agitated by storms, it never rests quiet, but feels through the unbroken continuity the violence which reigns in the South. Now, in the winter, a heavy dull bank of clouds intercepts during successive days even a glimpse of the sun. The temperature is by no means warm; in approaching these low latitudes I did not experience that delicious mildness, which is known for a few days in the Spring of England, or in first entering the Tropics in the Atlantic.

20th. During our whole stay the climate was far from pleasant; the ceaseless gloom which hangs over the country would render any landscape uninteresting. During 16 days I have only had one view of the Cordilleras behind Lima, which, seen in stages through the openings of the clouds, bore a very grand aspect. It is *proverbial* that rain never falls in this part of Peru; yet this is not correct, during nearly every day there is a thick drizzle or Scotch mist which is sufficient to make the streets muddy & one's clothes very damp. People are generally pleased to call this Peruvian dew. That much water does not fall is very manifest; the houses are covered with flat roofs, composed of hardened mud; on the mole ship-loads of wheat are piled up & thus kept for months without any cover. Lastly, the country is quite sterile, excepting where irrigated. The valley of the Rimac, however, wears as green a clothing as those in central Chili. I cannot say that I like what I have seen of Peru; in summer it is said that the Climate is much pleasanter; at all seasons of the year both inhabitants & foreigners suffer much from attacks of Ague.

No state in S. America, since the declaration of the Independence, has suffered more from Anarchy than Peru: at present there are four chiefs in arms for supreme government. If one should succeed in becoming very powerful, the others for a time coalesce against him, but afterwards are again disunited. The other day at the Anniversary of the Independence, high mass was performed, the President partaking of the Sacrament; during the 'Te Deum laudamus' instead of each regiment displaying the Peruvian flag, a black one with death's head was unfurled. Imagine what a government, when such a scene could be ordered on such an occasion to be typical of their determination of fighting to death! This state of affairs has happened very unfortunately for me, as I am precluded from making any excursions beyond the limits of the Towns. The barren Isd of S. Lorenzo which forms the harbor is nearly the only secure walk. I climbed one day to the highest part, nearly 1200 ft high. This is within the limit of the region of Clouds at this season. I there met with half a dozen different kinds of plants & an abundance of Cryptogamic vegetation; on the hills near Lima, at a little greater elevation, the ground is carpeted with moss & there are some beautiful yellow



lilies called Amancaes. This shows a much greater humidity than in a corresponding situation at Iquique. Gradually travelling Northward, the climate becomes damper, & at Guyaquil there are luxuriant forests.

Callao is a most miserable filthy, ill built, small sea-port; the inhabitants both here & at Lima present every imaginable shade of mixture between European, Negro & Indian blood. They appear a depraved, drunken set. The very atmosphere was loaded with foul smells; & that peculiar kind, which can be perceived in nearly all towns within the Tropics, was very strong. The Fortress which withstood Ld Cochrane's long siege, appears very imposing; the president is to-morrow going to dismantle it; he has not an officer to whom he could trust so important a charge. He himself obtained his present rank by being Governor & mutinying against the former president. Callao being such as it is & Lima seven miles distant, this is a disagreeable [place] to lie in a Ship; at present there are no means to take exercise. A short time since, Mr Wilson the Consul general, Lord E. Clinton & a Frenchman were riding & were attacked by a party of Soldiers – robbers, who plundered them so completely, that they returned naked, excepting their drawers. The robbers were actuated by warm Patriotism; they waved the Peruvian banner & intermingled cries of 'Viva la Patria'; 'give me your jacket'. 'Libertad Libertad' with 'Off with your trowsers'.

29th. I took a place in a coach which runs twice every day to Lima & spent five very pleasant days there. (August 3rd.) There is so much hospitality in these countries & the conversation of intelligent people in a new & foreign place cannot fail to be interesting. Moreover a residence of some years in contact with the polite & formal Spaniards certainly improves the manners of the English merchants. I found the Consul General, Mr Wilson, most exceedingly obliging: having been Aid de Camp to Bolivar he has travelled over much of S. America & knows its inhabitants right well.

Lima stands on a small plain formed during the gradual retreat of the sea; out of it rise barren steep hills like Islands. It is irrigated by two streams, the valleys of which rapidly contract & are hidden between the headlands of the first Cordilleras. The plain is divided into large green fields divided by straight mudwalls; there are very few trees excepting some willows & fruit trees. By the presence of an occasional cluster of Banana plants & Orange trees only does the landscape partake of a Tropical character. The city of Lima is now in a wretched state of decay; the streets are nearly unpaved & in all directions heaps of filth are piled up. Amongst these the Gallinazoes, tame as Poultry, are picking up bits of Carrion. There is little air of business; there are few Carriages, carts or even Cargo-Mules in the streets. The houses have generally an irregular upper story, built on account of the Earthquakes of plastered wood-work; some of the old houses now used by several families are immensely large & would rival in the suites of Apartments the most magnificent in London. Lima must indeed formerly have been a splendid, but small city; the extraordinary number of churches give to it, especially when seen from a short distance, a character quite distinct from the generality of towns.

There are two things in Lima which all Travellers have discussed; the ladies





*Lady in Lima*

'tapadas', or concealed in the saya y manta, & a fruit called Chilimoya. To my mind the former is as beautiful as the latter is delicious. The close elastic gown fits the figure closely & obliges the ladies to walk with small steps, which they do very



elegantly & display very white silk stockings & very pretty feet. They wear a black silk veil, which is fixed round the waist behind, is brought over the head & held by the hands before the face, allowing only one eye to remain uncovered. But then, that one eye is so black & brilliant & has such powers of motion & expression, that its effect is very powerful. Altogether the ladies are so metamorphised, that I at first felt as much surprised as if I had been introduced amongst a number of nice round mermaids, or any other such beautiful animal. And certainly they are better worth looking at than all the churches & buildings in Lima. Secondly for the Chilimoya, which is a very delicious fruit, but the flavour is about as difficult to describe, as it would be to a Blind man some particular shade of colour; it is neither a nutritive fruit like the Banana, a crude fruit like the Apple, or refreshing fruit like the Orange or Peach, but it is a very good & large fruit & that is all I have to say about it.

*Diary pp. 329-32*

One day I went out with some merchants to hunt in the immediate vicinity of the city. Our sport was very poor; but I had an opportunity of seeing the ruins of one of the ancient Indian villages, with its hill-like mound in the centre. The remains of houses, enclosures, irrigating streams, and burial mounds, scattered over this plain, cannot fail to give one a high idea of the condition and number of the ancient population. When their earthenware, woollen clothes, utensils of elegant forms cut out of the hardest rocks, tools of copper, ornaments of precious stones, palaces and hydraulic works, are considered, it is impossible not to respect the considerable advance made by them in the arts of civilization. The burial mounds, called Huacas, are really stupendous; although in some places it is only a natural hill which appears to have been incased and modelled.

There is also another and very different class of ruins, which possesses some interest, namely, those of old Callao, overwhelmed by the great earthquake of 1746, and its accompanying wave. The destruction must have been more complete even than at Concepcion. Quantities of shingle almost conceal the foundations of the walls, and vast masses of brickwork appear to have been whirled about by the retiring waves like pebbles. It has been stated that the land subsided during this memorable shock: I could not discover any proof of this; yet it seems far from improbable, for the form of the coast must certainly have undergone some change since the foundation of the old town; as no people in their senses would willingly have chosen for their building place the narrow spit of shingle on which the ruins now stand. On the island of San Lorenzo, there are very satisfactory proofs of elevation within the recent period: this of course would not contravene the belief of a small subsidence, if any signs of such movement could be discovered. The side of the mountain fronting the bay on that island, is worn into three obscure terraces, which are covered by masses of shells many hundred tons in weight, of species now existing on the beach. Several of the univalves had serpulæ and small balani attached on their insides; proving that they must have remained some time, after the animal had died, at the bottom of the sea. In such cases we may feel sure that they had not been carried up, as has



sometimes been believed, either by birds or men for food.

When examining the beds of shells, which have been raised above the level of the sea, on other parts of the coast, I often felt curious to trace their final disappearance from decay. On the island of San Lorenzo, this could be done in the most satisfactory manner: at a small height the shells were quite perfect; on a terrace, eighty-five feet above the sea, they were partially decomposed and coated by a soft scaly substance; at double this altitude a thin layer of calcareous powder beneath the soil, without a trace of organic structure, was all that could be discovered. This highly curious and satisfactory gradation of change, it is evident could be traced only under the peculiar conditions of this climate, where rain never falls so as to wash away the particles of shells in their last stage of decomposition. I was much interested by finding embedded, together with pieces of sea-weed in the mass of shells, in the eighty-five foot bed, a bit of *cotton-thread*, plaited rush, and the head of a stalk of Indian corn. This fact, coupled with another, which will be mentioned, proves I think the amount of eighty-five feet elevation since man inhabited this part of Peru. On the coast of Patagonia and La Plata, where perhaps the movements have been slower, there is evidence, as we have seen, that several mammalia have become extinct during a smaller change of level. At Valparaiso, where there exist abundant proofs of recent elevation to a greater altitude than in this part of Peru, I can show that the greatest possible change during the last 220 years, has not exceeded the small measure of fifteen feet.

On the mainland in front of San Lorenzo, near Bellavista, there is an extensive and level plain, at the height of about a hundred feet. The section on the coast shows that the lower part consists of alternating layers of sand and impure clay, together with some gravel; and the surface, to the depth of from three to six feet, of a reddish loam, containing a few scattered sea-shells, and numerous small fragments of coarse red earthenware. At first I was inclined to believe that this superficial bed must have been deposited beneath the sea; but I afterwards found in one spot, that it covered an artificial floor of round stones. The conclusion which then seemed most probable was, that at a period when the land stood at a less height, there was a plain very similar to the one now surrounding Callao, which being protected by a shingle beach, is raised but very little above the level of the sea. On this plain, with its clay beds, I imagine the Indians manufactured their earthen vessels; and that, during some violent earthquake, the sea broke over the beach and converted the plain into a temporary lake, as happened in 1713 around Callao. The water would then deposit mud, containing fragments of pottery from the kilns, and shells from the sea. This bed with fossil earthenware occurring at about the same altitude with the terrace on San Lorenzo, confirms the supposed amount of elevation within the human period.



C. D. TO MISS CAROLINE DARWIN

Lima - July - 1835

My dear Caroline,

My last letter was dated Coquimbo; I rejoice that I am now writing from Peru. I have received the three months' letters which were missing. I know that in a few days I shall receive several more. In the meantime I will write an outline of our proceedings since the last letter. From Coquimbo I rode to Guasco where in the valley I staid a few days; from that place to Copiapò there is a complete desert of two & a half days' journey, during which the poor horses had not one single mouthful to eat. The valley of Copiapò is a narrow little stripe of vegetation between districts utterly sterile. Indeed the whole of Chili to the north of Coquimbo I should think would rival Arabia in its desert appearance. When in the valley of Copiapò I made two journeys to the Cordilleras & reached the divisions of the waters; it was most piercingly cold in those elevated regions, but the cloudless sky from which rain does not fall more than once in several years, looked bright & cheerful. It is very hard & wearisome labor riding so much through such countries as Chili, & I was quite glad when my trip came to a close. Excluding the interest arising from Geology such travelling would be downright Martyrdom. But with this subject in your mind there is food in the grand surrounding scenes for constant meditation.

When I reached the port of Copiapò, I found the Beagle there, but with Wickham as temporary Captain. Shortly after the Beagle got into Valparaiso, news arrived that H.M.S. Challenger was lost at Arauco, and that Capt Seymour, a great friend of FitzRoy, & crew, were badly off amongst the Indians. The old commodore in the Blonde was very slack in his motions - in short, afraid of getting on that lee-shore in the winter; so that Capt FitzRoy had to bully him & at last offered to go as Pilot. We hear that they have succeeded in saving nearly all hands, but that the Captain & Commodore have had a tremendous quarrel; the former having hinted something about a Court-Martial to the old Commodore for his slowness. We suspect that such a taught hand as the Captain is, has opened the eyes of everyone fore & aft in the Blonde, to a surprising degree. We expect the Blonde will arrive here in a very few days & all are very curious to hear the news; no change in state politicks ever caused in its circle more conversation than this wonderful quarrel between the Captain & the Commodore has with us.

The Beagle after leaving the port of Copiapò touched at Iquique, in Peru, a place famous for the exportation of nitrate of soda. Here the country is an absolute desert; during a whole day's ride after leaving the Beach I saw only one vegetable production, & this was a minute yellow Lichen attached to old Bones. The inhabitants send forty miles for their water and fire-wood, & their provisions come from a greater distance. From Iquique we came direct to this place where we have been for the last week. The country is in such a state of Anarchy, that I am prevented from making any excursion. The very little I have seen of this country I do not like; the weather now in the winter season is constantly cloudy & misty & although it never rains there is an abundance of what the people are pleased to call Peruvian dew, but what in fact is a fine drizzle.



I am very anxious for the Galapagos Islands – I think both the geology & Zoology cannot fail to be very interesting. With respect to Otaheite, that fallen Paradise, I do not believe there will be much to see. In short, nothing will be very well worth seeing during the remainder of this voyage, excepting the last & glorious view of the shores of England. This probably is the last letter I shall write from S. America; I have written also to Mr Owen & Fox. With the three months' letters were two from Fox, the most kind & affectionate ones which could be written. He gives me a long account of his wife; I hope she is as nice a little lady as he seems to think & assuredly deserves. How very strange it will be thus finding all my friends old married men with families.

July 12th. I have received three more letters making the chain complete from England to February 1835. Capt. FitzRoy has arrived in good spirits & in a short time we sail for the Galapagos. He has just stated five minutes ago on the Quarter Deck that this time [next] year we shall be very near to England. I am both pleased & grieved at all your affectionate messages, wishing me to return home. If you think I do not long to see you again, you are indeed spurring a willing horse; but you can enter into my feelings of deep mortification if any cause even ill-health should have compelled me to have left the Beagle. I say should have, because you will agree with me, that it is hardly worth while now to think of any such step. Give my most affectionate love to poor dear old Erasmus, I am very glad that the same letter which brought an account of his illness, also told me of his recovery. During my whole stay at Plymouth I have but one single recollection which is pleasant, & that was his visit to me. Indeed I do not know to what period of my life I can look back without such thoughts coming to mind. I received his half letter & am grieved that I shall neither receive the letter or box which he is going to send till we reach the C. of Good Hope. What a good name that Cape has; indeed it will be one of Good Hope when the Beagle passes its bluff Head. You will not hear from me for *upwards* of 10 months, nor I from you, in which time may God bless you all for being such kind dear relations to me. Farewell.

Your affectionate brother,  
Charles Darwin.

N.B. If you do not understand my former directions about letters, you had better enclose them to Capt. Beaufort. Remember a letter too much (i.e. too late) is better than one too little.

N.B. 2. Tell my Father I have drawn a bill for 30£ to take with me money for the Islands.

*Darwin and Beagle* pp. 123–6

C.D. TO W. D. FOX

Lima, July, 1835

My dear Fox,

I have lately received two of your letters, one dated June & the other November 1834 (they reached me, however, in an inverted order). I was very glad to receive a history of this most important year in your life. Previously I had only



heard the plain fact that you were married. You are a true Christian & return good for evil, to send two such letters to so bad a correspondent as I have been. God bless you for writing so kindly and affectionately; if it is a pleasure to have friends in England, it is doubly so to think & know that one is not forgotten, because absent. This voyage is terribly long. I do so earnestly desire to return, yet I dare hardly look forward to the future, for I do not know what will become of me. Your situation is above envy: I do not venture even to frame such happy visions. To a person fit to take the office, the life of a clergyman is a type of all that is respectable and happy. You tempt me by talking of your fireside, whereas it is a sort of scene I never ought to think about. I saw the other day a vessel sail for England; it was quite dangerous to know how easily I might turn deserter. As for an English lady, I have almost forgotten what she is – something very angelic & good. As for the women in these countries, they wear caps and petticoats, and a very few have pretty faces, & then all is said. But if we are not wrecked on some unlucky reef, I will sit by that same fireside in Vale Cottage & tell some of the wonderful stories, which you seem to anticipate &, I presume, are not very ready to believe. Gracias a dios, the prospect of such times is rather shorter than formerly.

From this most wretched 'City of the Kings' we sail in a fortnight, from thence to Guayaquil, Galapagos, Marquesas, Society Islands, &c., &c. I look forward to the Galapagos with more interest than any other part of the voyage. They abound with active volcanoes, &, I should hope, contain Tertiary strata. I am glad to hear you have some thoughts of beginning Geology. I hope you will; there is so much larger a field for thought than in the other branches of Natural History. I am become a zealous disciple of Mr Lyell's views, as known in his admirable book. Geologising in South America, I am tempted to carry parts to a greater extent even than he does. Geology is a capital science to begin, as it requires nothing but a little reading, thinking, and hammering. I have a considerable body of notes together; but it is a constant subject of perplexity to me, whether they are of sufficient value for all the time I have spent about them, or whether animals would not have been of more certain value.

I shall indeed be glad once again to see you & tell you how grateful I feel for your steady friendship. God bless you, my very dear Fox. Believe me,

Yours affectionately,  
Chas Darwin.

*Letters* I pp. 262–3

C.D. TO PROFESSOR HENSLow

Lima July 12th 1835

My dear Henslow

This is the last letter, which I shall ever write to you from the shores of America, and for this reason I send it. In a few days time the Beagle will sail for the Galapagos Isds. I look forward with joy & interest to this, both as being somewhat nearer to England, & for the sake of having a good look at an active Volcano. Although we have seen Lava in abundance, I have never yet beheld the Crater.



I sent by H.M.S. Conway two large boxes of Specimens. The Conway sailed the latter end of June. With them were letters for you. Since that time I have travelled by land from Valparaiso to Copiapò & seen something more of the Cordilleras. Some of my Geological views have been subsequently to the last letter altered. I believe the upper mass of strata are not so very modern as I supposed. This last journey has explained to me much of the ancient history of the Cordilleras. I feel sure they formerly consisted of a chain of Volcanoes from which enormous streams of Lava were poured forth at the bottom of the sea. These alternate with sedimentary beds to a vast thickness: at a subsequent period these Volcanoes must have formed Islands, from which have been produced strata several thousand feet thick of coarse Conglomerate. These Islands were covered with fine trees; in the Conglomerate I found one 15 feet in circumference, perfectly silicified to the very centre. The alterations of compact crystalline rocks (I cannot doubt subaqueous Lavas) & sedimentary beds, now upheaved, fractured & indurated, from the main range of the Andes. The formation was produced at the time, when *Ammonites*, several *Terebratula*, *Gryphites*, *Oysters*, *Pectens*, *Mytili* etc etc lived. In the central parts of Chili, the structure of the lower beds are rendered very obscure, by the Metamorphic action, which has rendered even the coarsest Conglomerates, porphyritic. The Cordilleras of the Andes so worthy of admiration from the grandeur of their dimensions, [seem] to rise in dignity when it is considered that since the period of *Ammonites*, they have formed a marked feature in the Geography of the Globe.

The geology of these Mountains pleased me in one respect; when reading Lyell, it had always struck me that if the crust of the world goes on changing in a Circle, there ought to be somewhere found formations which having the *age* of the great European secondary beds, should possess the *structure* of Tertiary rocks, or those formed amidst Islands & in limited Basins. Now the alterations of Lava & coarse sediment, which form the upper parts of the Andes, correspond exactly to what would accumulate under such circumstances. In consequence of this I can only very *roughly* separate into three divisions the varying strata (perhaps 8000 ft thick) which compose these mountains. I am afraid you will tell me to learn my A.B.C. — to know quartz from Feldspar — before I indulge in such speculations.

I lately got hold of [the] report on M. Dessalines D'Orbigny's labors in S. America: I experienced rather a debasing degree of vexation to find he has described the geology of the Pampas, & that I have had some hard riding for nothing: it was however gratifying, that my conclusions are the same, as far as I can collect, with his results. It is also capital, that the whole of Bolivia will be described. I hope to be able to connect his Geology of that country, with mine of Chili. After leaving Copiapò, we touch[ed] at Iquique. I visited, but do not quite understand the position of the Nitrate of Soda beds. Here in Peru, from the state of Anarchy, I can make no expedition.

I hear from Home, that my Brother is going to send me a box with Books & a letter from you. It is very unfortunate that I cannot receive this before we reach Sydney, even if it ever gets safely so far. I shall not have another opportunity for many months of again writing to you. Will you have the charity to send me one



more letter (as soon as this reaches you) directed to the C. of Good Hope. Your letters besides affording me the greatest delight always give me a fresh stimulus for exertion. Excuse this Geologico-prosy letter & Farewell till you hear from me at Sydney & see me in Autumn of 1836. Believe me, dear Henslow,

Yours affectionately obliged  
Charles Darwin

*Darwin & Henslow* pp. 109–11

C.D. TO MISS SUSAN DARWIN

Lima August 3d 1835

My dear Susan,

I write to you again chiefly for the purpose of telling my Father that I have drawn a 50£ bill *instead of* the 30£ which I mentioned in my last letter. So that this must be notified to the Banker, otherwise he will be surprised at seeing the 50£. Our prolonged stay in this place has caused me to draw for the extra money. This delay has been a grievous waste of time for *me*: the Captain discovered in Lima some old charts & Papers which he thinks of considerable importance. Two of the Midshipmen, Mrs Usborne & Forsyth, are to be left behind to survey in a small Schooner the coast of Peru; afterwards they will return in a Merchant man to England.

I wish indeed the last month had been spent at Guyaquil or the Galapagos: but as the Spaniard says 'no hay remedio'. The Captain in a note which he sent me today from Lima says 'Growl not at all – Leeway will be made up. Good has been done unaccompanied by evil – ergo – I am happier than usual.' So that I am glad to say that all this time will not be lopped off the period of our return. We shall go round the world like a Flying Dutchman, & without doubt if this was the third instead of the fifth year the cruize would be delightful. We shall arrive at Sydney just at the right time of year; the Captain intends going within the reefs through Iona Stt. We hear a famous account of this passage, smooth water, anchorage every night, beautiful scenery, & splendid weather. I am quite impatient to get into a glowing hot climate; it sounds very odd to hear a person in Latitude 12° wishing for warmth. But really it is here uncomfortably chilly & damp with an eternally cloudy sky. When we reach the Galapagos the sun will be vertically over our heads, & I suspect my wishes will be fulfilled to the uttermost.

Living quietly on board the Ship & eating good dinners have made me twice as fat & happy as I have been for some months previously. I trust & believe that this month next year, we shall be very close to if not in England. It is too delightful to think that I shall see the leaves fall & hear the Robin sing next Autumn at Shrewsbury. My feelings are those of a Schoolboy to the smallest point; I doubt whether ever boy longed for his holidays as much as I do to see you all again. I even at present, although nearly half the world is between me & home, begin to arrange what I shall do, where I shall go, during the first week. In truth, I shall have a great deal to do for a long time after we return. My geological notes are become very bulky, & before they can be of any use will require much overhauling & examination. But sufficient for the day is the evil thereof. We shall



be in England next September, & that is enough for me.

Two men of war have lately arrived from Rio, but they brought no letters for the *Beagle*, so that the Admiral is forwarding them on to Sydney. We all on board are looking forward to Sydney as to a little England: it really will be very interesting to [see] the colony which must be the Empress of the South. Capt King has a large farm 200 miles in the interior. I shall certainly take horse & start; I am afraid however there are not Gauchos who understand the real art of travelling.

I have scarcely stirred out of the Ship for the last fortnight: the country is in such a miserable state of misgovernment that nothing can exceed it. The President is daily shooting & murdering anyone who disobeys his orders. One is that all property should be at the disposal of the state, & another that every man from 15 to 40 should enroll himself as ready to be his soldier. Yesterday several young men were shot for neglecting to give in their names. Is not this a precious state of things?

Goodbye till I again write from Sydney. Give my most affectionate love to my Father & to all at home.

My dear old Granny, your affectionate brother,  
Charles Darwin.

Give my love also to Nancy.

*Darwin and Beagle* pp. 126-8

On September 7th, the *Beagle* sailed for the Galapagos Islands, reaching Chatham Island (now known as San Cristobal) on September 15th. The next month was spent surveying the group. Although Darwin had expected the main interest of the Islands to lie in their geology, it turned out otherwise, and no excuse is needed for including in full the passage from the *Narrative* concerned with their zoology, which in later editions of the *Journal of Researches* was considerably expanded.

SEPT. 17th. The *Beagle* was moved into St Stephen's harbor. We found there an American Whaler & we previously had seen two at Hoods Island. The Bay swarmed with animals; Fish, Shark & Turtles were popping their heads up in all parts. Fishing lines were soon put overboard & great numbers of fine fish 2 & even 3 feet long were caught. This sport makes all hands very merry; loud laughter & the heavy flapping of the fish are heard on every side. After dinner a party went on shore to try to catch Tortoises, but were unsuccessful. These islands appear paradises for the whole family of Reptiles. Besides three kinds of Turtles, the Tortoise is so abundant that [a] single Ship's company here caught 500-800 in a short time. The black Lava rocks on the beach are frequented by large (2-3 ft) most disgusting, clumsy Lizards. They are as black as the porous rocks over which they crawl & seek their prey from the Sea. Somebody calls them 'imps of darkness'. They assuredly will become the land they inhabit. When on shore I proceeded to botanize & obtained 10 different flowers; but such insignificant, ugly little flowers, as would better become an Arctic than a Tropical country. The birds are Strangers to Man & think him as innocent as their



*San Cristobal*

SAN CRISTOBAL ISLAND.

*Watering Place*

CHATHAM ISLAND.



WATERING PLACE.



SAN CRISTOBAL ISLAND.



countrymen the huge Tortoises. Little birds, within 3 or four feet, quietly hopped about the Bushes & were not frightened by stones being thrown at them. Mr King killed one with his hat & I pushed off a branch with the end of my gun a large Hawk.

*Diary* p.334

SEPT. 26th & 27th. I industriously collected all the animals, plants, insects & reptiles from this Island. It will be very interesting to find from future comparison to what district or 'centre of creation' the organized beings of this archipelago must be attached.

I ascended the highest hill in the Isd, 2000 feet; it was covered in its upper part with coarse grass & Shrubs. The remains of an old Crater were very evident; small as the whole island is, I counted 39 conical hills, in the summit of all of which there was a more or less perfect circular depression. It is long since the Lava streams which form the lower parts of the Island flowed from any of these Craters. Hence we have a smoother surface, a more abundant soil, & more fertile vegetation. It is probable that much of the Lava is of subaqueous origin.

*Diary* pp.337-8

3306 cop } Thenca: male: Charles Isd  
3307 cop } do: do: Chatham Isd.

These birds are closely allied in appearance to the Thenca of Chile (2169) or Callandra of la Plata (1216). In their habits I cannot point out a single difference; They are lively inquisitive, active, *run fast*, frequent houses to pick the meat of the Tortoise, which is hung up, sing tolerably well; are said to build a simple open nest; are *very* tame, a character in common with the other birds: I *imagined* however its note or cry was rather different from the Thenca of Chile? Are very abundant; over the whole Island; are chiefly tempted up into the high & damp parts, by the houses & cleared ground.

I have specimens from four of the larger Islands; the two above enumerated, and (3349: female. Albermarle Isd) & (3350: male: James Isd). The specimens from Chatham & Albermarle Isd appear to be the same; but the other two are different. In each Isld each kind is *exclusively* found: habits of all are indistinguishable. When I recollect, the fact that the form of the body, shape of scales & general size, the Spaniards can at once pronounce, from which Island any Tortoise may have been brought. When I see these Islands in sight of each other, & possessed of but a scanty stock of animals, tenanted by these birds, but slightly differing in structure & filling the same place in Nature, I must suspect they are only varieties. The only fact of a similar kind of which I am aware, is the constant asserted difference between the wolf-like Fox of East & West Falkland Islds. If there is the slightest foundation for these remarks the zoology of Archipelagoes will be well worth examining; for such facts would undermine the stability of Species.

[from *Darwin's Ornithological Notes - Galapagos* Ms. 74 [1835 Sept.-Oct] - Barlow (1963) p.262]



I will now offer a few general observations on the natural history of these islands. I endeavoured to make as nearly a perfect collection in every branch as time permitted. The plants have not yet been examined, but Professor Henslow, who has kindly undertaken the description of them, informs me that there are probably many new species, and perhaps even some new genera. They all have an extremely weedy character, and it would scarcely have been supposed, that they had grown at an inconsiderable elevation directly under the equator. In the lower and sterile parts, the bush, which from its minute brown leaves chiefly gives the leafless appearance to the brushwood, is one of the Euphorbiaceae. In the same region an acacia and a cactus (*Opuntia Galapageia*), with large oval compressed articulations, springing from a cylindrical stem, are in some parts common. These are the only trees which in that part afford any shade. Near the summits of the different islands, the vegetation has a very different character; ferns and coarse grasses are abundant; and the commonest tree is one of the Compositae. Tree-ferns are not present. One of the most singular characters of the Flora, considering the position of this archipelago, is the absence of every member of the palm family. Cocos Island, on the other hand, which is the nearest point of land, takes its name from the great number of cocoa-nut trees on it. From the presence of the *Opuntias* and some other plants, the vegetation partakes more of the character of that of America than of any other country.

Of mammalia a large kind of mouse forms a well-marked species. From its large thin ears, and other characters, it approaches in form a section of the genus, which is confined to the sterile regions of South America. There is also a rat which Mr Waterhouse believes is probably distinct from the English kind; but I cannot help suspecting that it is only the same altered by the peculiar conditions of its new country.

In my collections from these islands, Mr Gould considers that there are twenty-six different species of land birds. With the exception of one, all probably are undescribed kinds, which inhabit this archipelago, and no other part of the world. Among the waders and waterfowl it is more difficult, without detailed comparison, to say what are new. But a water-rail which lives near the summits of the mountains, is undescribed, as perhaps is a *Totanus* and a heron. The only kind of gull which is found among these islands, is also new; when the wandering habits of this genus are considered, this is a very remarkable circumstance. The species most closely allied to it, comes from the Strait of Magellan. Of the other aquatic birds, the species appear the same with well-known American birds.

The general character of the plumage of these birds is extremely plain, and like the Flora possesses little beauty. Although the species are thus peculiar to the archipelago, yet nearly all in their general structure, habits, colour of feathers, and even tone of voice, are strictly American. The following brief list will give an idea of their kinds. 1st. A buzzard, having many of the characters of *Polyborus* or *Caracara*; and in its habits not to be distinguished from that peculiar South American genus; 2d. Two owls; 3d. Three species of tyrant-flycatchers – a form strictly American. One of these appears identical with a common kind (*Muscicapa coronata*? Lath.), which has a very wide range, from La Plata throughout Brazil to





*Charles Island, Galapagos*

Mexico; 4th. A *sylvicola*, an American form, and especially common in the northern division of the continent; 5th. Three species of mocking-birds, a genus common to both Americas; 6th. A finch, with a stiff tail and a long claw to its hinder toe, closely allied to a North American genus; 7th. A swallow belonging to the American division of that genus; 8th. A dove, like, but distinct from, the Chilian species; 9th. A group of finches, of which Mr Gould considers there are thirteen species; and these he has distributed into four new sub-genera. These birds are the most singular of any in the archipelago. They all agree in many points; namely, in a peculiar structure of their bill, short tails, general form, and in their plumage. The females are gray or brown, but the old cocks jet-black. All the species, excepting two, feed in flocks on the ground, and have very similar habits. It is very remarkable that a nearly perfect gradation of structure in this one group can be traced in the form of the beak, from one exceeding in dimensions that of the largest gros-beak, to another differing but little from that of a warbler. Of the aquatic birds I have already remarked that some are peculiar to these islands, and some common to North and South America.

We will now turn to the order of reptiles, which forms, perhaps, the most striking feature in the zoology of these islands. The species are not numerous, but the number of individuals of each kind, is extraordinarily great. There is one kind



both of the turtle and tortoise; of lizards four; and of snakes about the same number.

I will first describe the habits of the tortoise (*Testudo Indicus*) which has been so frequently alluded to. These animals are found, I believe, in all the islands of the Archipelago; certainly in the greater number. They frequent in preference the high damp parts, but likewise inhabit the lower and arid districts. I have already mentioned proofs, from the numbers which have been taken in a single day, how very numerous they must be. Some individuals grow to an immense size: Mr Lawson, an Englishman, who had at the time of our visit charge of the colony, told us that he had seen several so large, that it required six or eight men to lift them from the ground; and that some had afforded as much as two hundred pounds of meat. The old males are the largest, the females rarely growing to so great a size. The male can readily be distinguished from the female by the greater length of its tail. The tortoises which live on those islands where there is no water, or in the lower and arid parts of the others, chiefly feed on the succulent cactus. Those which frequent the higher and damp regions, eat the leaves of various trees, a kind of berry (called guayavita) which is acid and austere, and likewise a pale green filamentous lichen, that hangs in tresses from the boughs of the trees.

The tortoise is very fond of water, drinking large quantities, and wallowing in the mud. The larger islands alone possess springs, and these are always situated towards the central parts, and at a considerable elevation. The tortoises, therefore, which frequent the lower districts, when thirsty, are obliged to travel from a long distance. Hence broad and well-beaten paths radiate off in every direction from the wells even down to the sea-coast; and the Spaniards by following them up, first discovered the watering-places. When I landed at Chatham Island, I could not imagine what animal travelled so methodically along the well-chosen tracks. Near the springs it was a curious spectacle to behold many of these great monsters; one set eagerly travelling onwards with outstretched necks, and another set returning, after having drunk their fill. When the tortoise arrives at the spring, quite regardless of any spectator, it buries its head in the water above its eyes, and greedily swallows great mouthfuls, at the rate of about ten in a minute. The inhabitants say each animal stays three or four days in the neighbourhood of the water, and then returns to the lower country; but they differed in their accounts respecting the frequency of these visits. The animal probably regulates them according to the nature of the food which it has consumed. It is, however, certain, that tortoises can subsist even on those islands where there is no other water, than what falls during a few rainy days in the year.

I believe it is well ascertained, that the bladder of the frog acts as a reservoir for the moisture necessary to its existence: such seems to be the case with the tortoise. For some time after a visit to the springs, the urinary bladder of these animals is distended with fluid, which is said gradually to decrease in volume, and to become less pure. The inhabitants, when walking in the lower district, and overcome with thirst, often take advantage of this circumstance, by killing a tortoise, and if the bladder is full, drinking its contents. In one I saw killed, the fluid was quite limpid, and had only a *very slightly* bitter taste. The inhabitants, however, always



drink first the water in the pericardium, which is described as being best.

The tortoises, when moving towards any definite point, travel by night and day, and arrive at their journey's end much sooner than would be expected. The inhabitants, from observations on marked individuals, consider that they can move a distance of about eight miles in two or three days. One large tortoise, which I watched, I found walked at the rate of sixty yards in ten minutes, that is 360 in the hour, or four miles a day, allowing also a little time for it to eat on the road.

During the breeding season, when the male and female are together, the male utters a hoarse roar or bellowing, which it is said, can be heard at the distance of more than a hundred yards. The female never uses her voice, and the male only at such times; so that when the people hear this noise, they know the two are together. They were at this time (October) laying their eggs. The female, where the soil is sandy, deposits them together, and covers them up with sand; but where the ground is rocky she drops them indiscriminately in any hollow. Mr Bynoe found seven placed in a line in a fissure. The egg is white and spherical; one which I measured was seven inches and three-eighths in circumference. The young animals, as soon as they are hatched, fall a prey in great numbers to the buzzard, with the habits of the Caracara. The old ones seem generally to die from accidents, as from falling down precipices. At least several of the inhabitants told me, they had never found one dead without some such apparent cause.

The inhabitants believe that these animals are absolutely deaf; certainly they do not overhear a person walking close behind them. I was always amused, when overtaking one of these great monsters as it was quietly pacing along, to see how suddenly, the instant I passed, it would draw in its head and legs, and uttering a deep hiss fall to the ground with a heavy sound, as if struck dead. I frequently got on their backs, and then, upon giving a few raps on the hinder part of the shell, they would rise up and walk away; but I found it very difficult to keep my balance.

The flesh of this animal is largely employed, both fresh and salted; and a beautifully clear oil is prepared from the fat. When a tortoise is caught, the man makes a slit in the skin near its tail, so as to see inside its body, whether the fat under the dorsal plate is thick. If it is not, the animal is liberated; and it is said to recover soon from this strange operation. In order to secure the tortoises, it is not sufficient to turn them like turtle, for they are often able to regain their upright position.

It was confidently asserted, that the tortoises coming from different islands in the archipelago were slightly different in form; and that in certain islands they attained a larger average size than in others. Mr Lawson maintained that he could at once tell from which island any one was brought. Unfortunately, the specimens which came home in the *Beagle* were too small to institute any certain comparison. This tortoise, which goes by the name of *Testudo Indicus*, is at present found in many parts of the world. It is the opinion of Mr Bell, and some others who have studied reptiles, that it is not improbable that they all originally came from this archipelago. When it is known how long these islands have been frequented by the bucaniers, and that they constantly took away numbers of these



animals alive, it seems very probable that they should have distributed them in different parts of the world. If this tortoise does not originally come from these islands, it is a remarkable anomaly; inasmuch as nearly all the other land inhabitants seem to have had their birthplace here.

Of lizards there are four or five species; two probably belong to the South American genus *Leiocephalus*, and two to *Amblyrhincus*. This remarkable genus was characterized by Mr Bell, from a stuffed specimen sent from Mexico, but which I conceive there can be little doubt originally came through some whaling ship from these islands. The two species agree pretty closely in general appearance; but one is aquatic and the other terrestrial in its habits. Mr Bell thus concludes his description of *Amb. cristatus*: 'On a comparison of this animal with the true Iguanas, the most striking and important discrepancy is in the form of the head. Instead of the long, pointed, narrow muzzle of those species, we have here a short, obtusely truncated head, not so long as it is broad, the mouth consequently only capable of being opened to a very short space. These circumstances, with the shortness and equality of the toes, and the strength and curvature of the claws, evidently indicate some striking peculiarity in its food and general habits, on which, however, in the absence of all certain information, I shall abstain from offering any conjecture.' The following account of these two lizards, will, I think, show with what judgment Mr Bell foresaw a variation in habit, accompanying change in structure.

First for the aquatic kind (*Amb. cristatus*). This lizard is extremely common on all the islands throughout the Archipelago. It lives exclusively on the rocky sea-beaches, and is never found, at least I never saw one, even ten yards inshore. It is a hideous-looking creature, of a dirty black colour, stupid and sluggish in its movements. The usual length of a full-grown one is about a yard, but there are some even four feet long: I have seen a large one which weighed twenty pounds. On the island of Albemarle they seem to grow to a greater size than on any other. These lizards were occasionally seen some hundred yards from the shore swimming about; and Captain Collnett, in his Voyage, says, 'they go out to sea in shoals to fish'. With respect to the object, I believe he is mistaken; but the fact stated on such good authority cannot be doubted. When in the water the animal swims with perfect ease and quickness, by a serpentine movement of its body and flattened tail, the legs, during this time, being motionless and closely collapsed on its sides. A seaman on board sank one, with a heavy weight attached to it, thinking thus to kill it directly; but when an hour afterwards he drew up the line, the lizard was quite active. Their limbs and strong claws are admirably adapted for crawling over the rugged and fissured masses of lava, which every where form the coast. In such situations, a group of six or seven of these hideous reptiles may oftentimes be seen on the black racks, a few feet above the surf, basking in the sun with outstretched legs.

I opened the stomach of several, and in each case found it largely distended with minced sea-weed, of that kind which grows in thin foliaceous expansions of a bright green or dull red colour. I do not recollect having observed this sea-weed in any quantity on the tidal rocks; and I have reason to believe it grows at the



bottom of the sea, at some little distance from the coast. If such is the case, the object of these animals occasionally going out to sea is explained. The stomach contained nothing but the seaweed. Mr Bynoe, however, found a piece of a crab in one; but this might have got in accidentally, in the same manner as I have seen a caterpillar, in the midst of some lichen, in the paunch of a tortoise. The intestines were large, as in other herbivorous animals.

The nature of this lizard's food, as well as the structure of its tail, and the certain fact of its having been seen voluntarily swimming out at sea, absolutely prove its aquatic habits; yet there is in this respect one strange anomaly; namely, that when frightened it will not enter the water. From this cause, it is easy to drive these lizards down to any little point overhanging the sea, where they will sooner allow a person to catch hold of their tail than jump into the water. They do not seem to have any notion of biting; but when much frightened they squirt a drop of fluid from each nostril. One day I carried one to a deep pool left by the retiring tide, and threw it in several times as far as I was able. It invariably returned in a direct line to the spot where I stood. It swam near the bottom, with a very graceful and rapid movement, and occasionally aided itself over the uneven ground with its feet. As soon as it arrived near the margin, but still being under water, it either tried to conceal itself in the tufts of sea-weed, or it entered some crevice. As soon as it thought the danger was past, it crawled out on the dry rocks, and shuffled away as quickly as it could. I several times caught this same lizard, by driving it down to a point, and though possessed of such perfect powers of diving and swimming, nothing would induce it to enter the water; and as often as I threw it in, it returned in the manner above described. Perhaps this singular piece of apparent stupidity may be accounted for by the circumstance, that this reptile has no enemy whatever on shore, whereas at sea it must often fall a prey to the numerous sharks. Hence, probably urged by a fixed and hereditary instinct that the shore is its place of safety, whatever the emergency may be, it there takes refuge.

During our visit (in October) I saw extremely few small individuals of this species, and none I should think under a year old. From this circumstance it seems probable that the breeding season had not commenced. I asked several of the inhabitants if they knew where it laid its eggs: they said, that although well acquainted with the eggs of the other kind, they had not the least knowledge of the manner in which this species is propagated; a fact, considering how common an animal this lizard is, not a little extraordinary.

We will now turn to the terrestrial species (*Amb. subcristatus* of Gray). This species, differently from the last, is confined to the central islands of the Archipelago, namely to Albemarle, James, Barrington, and Indefatigable. To the southward, in Charles, Hood, and Chatham islands, and to the northward, in Towers, Bindloes, and Abington, I neither saw nor heard of any. It would appear as if this species had been created in the centre of the Archipelago, and thence had been dispersed only to a certain distance.

In the central islands they inhabit both the higher and damp, as well as the lower and sterile parts; but in the latter they are much the most numerous. I cannot give a more forcible proof of their numbers, than by stating, that when we



were left at James Island, we could not for some time find a spot free from their burrows, on which to pitch our tent. These lizards, like their brothers the sea-kind, are ugly animals; and from their low facial angle have a singularly stupid appearance. In size perhaps they are a little inferior to the latter, but several of them weighed between ten and fifteen pounds each. The colour of their belly, front legs, and head (excepting the crown which is nearly white), is a dirty yellowish-orange: the back is a brownish-red, which in the younger specimens is darker. In their movements they are lazy and half torpid. When not frightened, they slowly crawl along with their tails and bellies dragging on the ground. They often stop, and doze for a minute with closed eyes, and hind legs spread out on the parched soil.

They inhabit burrows; which they sometimes excavate between fragments of lava, but more generally on level patches of the soft volcanic sandstone. The holes do not appear to be very deep, and they enter the ground at a small angle; so that when walking over these lizard *warrens*, the soil is constantly giving way, much to the annoyance of the tired walker. This animal when excavating its burrow, alternately works the opposite sides of its body. One front leg for a short time scratches up the soil, and throws it towards the hind foot, which is well placed so as to heave it beyond the mouth of the hole. This side of the body being tired, the other takes up the task, and so on alternately. I watched one for a long time, till half its body was buried; I then walked up and pulled it by the tail; at this it was greatly astonished, and soon shuffled up to see what was the matter; and then stared me in the face, as much as to say, 'What made you pull my tail?'

They feed by day, and do not wander far from their burrows; and if frightened they rush to them with a most awkward gait. Except when running down hill, they cannot move very fast; which appears chiefly owing to the lateral position of their legs.

They are not at all timorous: when attentively watching any one, they curl their tails, and raising themselves on their front legs, nod their heads vertically, with a quick movement, and try to look very fierce: but in reality they are not at all so; if one just stamps the ground, down go their tails, and off they shuffle as quickly as they can. I have frequently observed small muscivorous lizards, when watching any thing, nod their heads in precisely the same manner; but I do not at all know for what purpose. If this *Amblyrhincus* is held, and plagued with a stick, it will bite it very severely; but I caught many by the tail, and they never tried to bite me. If two are placed on the ground and held together, they will fight and bite each other till blood is drawn.

The individuals (and they are the greater number) which inhabit the lower country, can scarcely taste a drop of water throughout the year; but they consume much of the succulent cactus, the branches of which are occasionally broken off by the wind. I have sometimes thrown a piece to two or three when together; and it was amusing enough to see each trying to seize and carry it away in its mouth, like so many hungry dogs with a bone. They eat very deliberately, but do not chew their food. The little birds are aware how harmless these creatures are: I have seen one of the thick-billed finches picking at one end of a piece of cactus (which is in request among all the animals of the lower region), whilst a lizard was eating at the



other; and afterwards the little bird with the utmost indifference hopped on the back of the reptile.

I opened the stomachs of several, and found them full of vegetable fibres, and leaves of different trees, especially of a species of acacia. In the upper region they live chiefly on the acid and astringent berries of the guayavita, under which trees I have seen these lizards and the huge tortoises feeding together. To obtain the acacia-leaves, they crawl up the low stunted trees; and it is not uncommon to see one or a pair quietly browsing, whilst seated on a branch several feet above the ground.

The meat of these animals when cooked is white, and by those whose stomachs rise above all prejudices, it is relished as very good food. Humboldt has remarked that in inter-tropical South America, all lizards which inhabit *dry* regions are esteemed delicacies for the table. The inhabitants say, that those inhabiting the damp region drink water, but that the others do not travel up for it from the sterile country like the tortoises. At the time of our visit, the females had within their bodies numerous large elongated eggs. These they lay in their burrows, and the inhabitants seek them for food.

These two species of *Amblyrhynchus* agree, as I have already stated, in general structure, and in many of their habits. Neither have that rapid movement, so characteristic of true *Lacerta* and *Iguana*. They are both herbivorous, although the kind of vegetation consumed in each case is so very different. Mr Bell has given the name to the genus from the shortness of the snout: indeed, the form of the mouth may almost be compared to that of the tortoise. One is tempted to suppose this is an adaptation to their herbivorous appetites. It is very interesting thus to find a well-characterized genus, having its aquatic and terrestrial species, belonging to so confined a portion of the world. The former species is by far the most remarkable, because it is the only existing Saurian, which can properly be said to be a maritime animal. I should perhaps have mentioned earlier, that in the whole archipelago, there is only one rill of fresh water that reaches the coast; yet these reptiles frequent the sea-beaches, and no other parts in all the islands. Moreover, there is no existing lizard, as far as I am aware, excepting this *Amblyrhynchus*, that feeds exclusively on aquatic productions. If, however, we refer to epochs long past, we shall find such habits common to several gigantic animals of the Saurian race.

To conclude with the order of reptiles. Of snakes there are several species, but all harmless. Of toads and frogs there are none. I was surprised at this, considering how well the temperate and damp woods in the elevated parts appeared adapted for their habits. It recalled to my mind the singular statement made by Bory St Vincent, namely, that none of this family are to be found on the volcanic islands in the great oceans. There certainly appears to be some foundation for this observation; which is the more remarkable, when compared with the case of lizards, which are generally among the earliest colonists of the smallest islet. It may be asked, whether this is not owing to the different facilities of transport through salt-water, of the eggs of the latter protected by a calcareous coat, and of the slimy spawn of the former?

As I at first observed, these islands are not so remarkable for the number of



species of reptiles, as for that of individuals; when we remember the well-beaten paths made by the many hundred great tortoises – the warrens of the terrestrial *Amblyrhincus* – and the groups of the aquatic species basking on the coast-rocks – we must admit that there is no other quarter of the world, where this order replaces the herbivorous mammalia in so extraordinary a manner. It is worthy of observation by the geologist (who will probably refer back in his mind to the secondary periods, when the Saurians were developed with dimensions, which at the present day can be compared only to the cetaceous mammalia), that this archipelago, instead of possessing a humid climate and rank vegetation, cannot be considered otherwise than extremely arid, and for an equatorial region, remarkably temperate.

To finish with the zoology: I took great pains in collecting the insects, but I was surprised to find, even in the high and damp region, how exceedingly few they were in number. The forests of Tierra del Fuego are certainly much more barren; but with that exception I never collected in so poor a country. In the lower and sterile land I took seven species of Heteromera, and a few other insects; but in the fine thriving woods towards the centre of the islands, although I perseveringly swept under the bushes during all kinds of weather, I obtained only a few minute Diptera and Hymenoptera. Owing to this scarcity of insects, nearly all the birds live in the lower country; and the part which any one would have thought much the most favourable for them, is frequented only by a few of the small tyrant-flycatchers. I do not believe a single bird, excepting the water-rail, is confined to the damp region. Mr Waterhouse informs me that nearly all the insects belong to European forms, and that they do not by any means possess an equatorial character. I did not take a single one of large size, or of bright colours. This last observation applies equally to the birds and flowers. It is worthy of remark, that the only land-bird with bright colours, is that species of tyrant-flycatcher, which seems to be a wanderer from the continent. Of shells, there are a considerable number of land kinds, all of which, I believe are confined to this archipelago. Even of marine species, a large proportion were not known, before the collection made by Mr Cuming on these islands was brought to England.

I will not here attempt to come to any definite conclusions, as the species have not been accurately examined; but we may infer, that, with the exception of a few wanderers, the organic beings found on this archipelago are peculiar to it; and yet that their general form strongly partakes of an American character. It would be impossible for any one accustomed to the birds of Chile and La Plata to be placed on these islands, and not to feel convinced that he was, as far as the organic world was concerned, on American ground. This similarity in type, between distant islands and continents, while the species are distinct, has scarcely been sufficiently noticed. The circumstance would be explained, according to the views of some authors, by saying that the creative power had acted according to the same law over a wide area.

It has been mentioned, that the inhabitants can distinguish the tortoises, according to the islands whence they are brought. I was also informed that many of the islands possess trees and plants which do not occur on the others. For



instance the berry-bearing tree, called Guyavita, which is common on James Island, certainly is not found on Charles Island, though appearing equally well fitted for it. Unfortunately, I was not aware of these facts till my collection was nearly completed: it never occurred to me, that the productions of islands only a few miles apart, and placed under the same physical conditions, would be dissimilar. I therefore did not attempt to make a series of specimens from the separate islands. It is the fate of every voyager, when he has just discovered what object in any place is more particularly worthy of his attention, to be hurried from it. In the case of the mocking-bird, I ascertained (and have brought home the specimens) that one species (*Orpheus trifasciatus*, Gould) is exclusively found in Charles Island; a second (*O. parvulus*) on Albemarle Island; and a third (*O. melanotus*) common to James and Chatham Islands. The two last species are closely allied, but the first would be considered by every naturalist as quite distinct. I examined many specimens in the different islands, and in each the respective kind was *alone* present. These birds agree in general plumage, structure, and habits; so that the different species replace each other in the economy of the different islands. These species are not characterized by the markings on the plumage alone, but likewise by the size and form of the bill, and other differences. I have stated, that in the thirteen species of ground-finches, a nearly perfect gradation may be traced, from a beak extraordinarily thick, to one so fine, that it may be compared to that of a warbler. I very much suspect, that certain members of the series are confined to different islands; therefore, if the collection had been made on any *one* island, it would not have presented so perfect a gradation. It is clear, that if several islands have each their peculiar species of the same genera, when these are placed together, they will have a wide range of character. But there is not space in this work, to enter on this curious subject.

Before concluding my account of the zoology of these islands, I must describe more in detail the tameness of the birds. This disposition is common to all the terrestrial species; namely, to the mocking-birds, the finches, sylvicolae, tyrant-flycatchers, doves, and hawks. There is not one which will not approach sufficiently near to be killed with a switch, and sometimes, as I have myself tried, with a cap or hat. A gun is here almost superfluous; for with the muzzle of one I pushed a hawk off the branch of a tree. One day a mocking-bird alighted on the edge of a pitcher (made of the shell of a tortoise), which I held in my hand whilst lying down. It began very quietly to sip the water, and allowed me to lift it with the vessel from the ground. I often tried, and very nearly succeeded, in catching these birds by their legs. Formerly the birds appear to have been even tamer than at present. Cowley (in the year 1684) says that the 'Turtle-doves were so tame that they would often alight upon our hats and arms, so as that we could take them alive: they not fearing man, until such time as some of our company did fire at them, whereby they were rendered more shy.' Dampier (in the same year) also says that a man in a morning's walk might kill six or seven dozen of these birds. At present, although certainly very tame, they do not alight on people's arms; nor do they suffer themselves to be killed in such numbers. It is surprising that the change has not been greater; for these islands during the last hundred and fifty years, have



been frequently visited by bucaniers and whalers; and the sailors, wandering through the woods in search of tortoises, always take delight in knocking down the little birds.

These birds, although much persecuted, do not become wild in a short time: in Charles Island, which had then been colonized about six years, I saw a boy sitting by a well with a switch in his hand, with which he killed the doves and finches as they came to drink. He had already procured a little heap of them for his dinner; and he said he had constantly been in the habit of waiting there for the same purpose. We must conclude that the birds, not having as yet learnt that man is a more dangerous animal than the tortoise, or the amblyrhincus, disregard us, in the same manner as magpies in England do the cows and horses grazing in the fields.

The Falkland Islands offer a second instance of this disposition among its birds. The extraordinary tameness of the dark-coloured *Furnarius* has been remarked by Pernety, Lesson, and other voyagers. It is not, however, peculiar to that bird: the Caracara, snipe, upland and lowland goose, thrush, *Emberiza*, and even some true hawks, are all more or less tame. Both hawks and foxes are present; and as the birds are so tame, we may infer that the absence of all rapacious animals at the Galapagos, is not the cause of their tameness there. The geese at the Falklands, by the precaution they take in building on the islets, show that they are aware of their danger from the foxes; but they are not by this rendered wild towards man. This tameness of the birds, especially the waterfowl, is strongly contrasted with the habits of the same species in Tierra del Fuego, where for ages past they have been persecuted by the wild inhabitants. In the Falklands, the sportsman may sometimes kill more of the upland geese in one day, than he is able to carry home; whereas in Tierra del Fuego, it is nearly as difficult to kill one, as it is in England of the common wild species.

In the time of Pernety (1763), all the birds appear to have been much tamer than at present. Pernety states that the *Furnarius* would almost perch on his finger; and that with a wand he killed ten in half an hour. At that period, the birds must have been about as tame as they now are at the Galapagos. They appear to have learnt caution more quickly at the Falklands than at the latter place, and they have had proportionate means of experience; for besides frequent visits from vessels, the islands have been at intervals colonized during the whole period.

Even formerly, when all the birds were so tame, by Pernety's account it was impossible to kill the black-necked swan. It is rather an interesting fact, that this is a bird of passage, and therefore brings with it the wisdom learnt in foreign countries.

I have not met with any account of the *land* birds being so tame, in any other quarter of the world, as at the Galapagos and Falkland Islands. And it may be observed that of the few archipelagoes of any size, which when discovered were uninhabited by man, these two are among the most important. From the foregoing statements we may, I think, conclude; first, that the wildness of birds with regard to man, is a particular instinct directed against *him*, and not dependent on any general degree of caution arising from other sources of danger; secondly,



that it is not acquired by them in a short time, even when much persecuted; but that in the course of successive generations it becomes hereditary. With domesticated animals we are accustomed to see instincts becoming hereditary; but with those in a state of nature, it is more rare to discover instances of such acquired knowledge. In regard to the wildness of birds towards men, there is no other way of accounting for it. Few young birds in England have been injured by man, yet all are afraid of him: many individuals, on the other hand, both at the Galapagos and at the Falklands, have been injured, but yet have not learned that salutary dread. We may infer from these facts, what havoc the introduction of any new beast of prey must cause in a country, before the instincts of the aborigines become adapted to the stranger's craft or power.

*Narrative* 3 pp.460-78

FitzRoy's conclusions were not quite the same on certain issues.

Striking instances of the manner in which high land deprives air of its moisture may be seen at the Galapagos. Situated in a wind nearly perennial, those sides only which are exposed to it (the southern) are covered with verdure, and have water: all else is dry and barren, excepting such high ground as the passing clouds hang upon indolently as they move northward. In a similar manner may we not conclude that western Peru is deprived of rain – since the easterly trade wind which carries moisture, and consequent fertility, to eastern Peru, is drained, or dried, as it crosses the Andes? And may we not extend this reasoning to other countries similarly situated, such as Patagonia, perhaps Arabia, and even Africa, upon whose arid deserts no moist wind blows? Currents of air, moving from ocean to land, convey vapour; but as these currents pass over high land, or even a considerable extent of low country, much if not the whole of their aqueous contents is discharged, and until such a body of air has again acquired moisture, it is found to be dry, parching, and unfavourable to vegetation.

All the small birds that live on these lava-covered islands have short beaks, very thick at the base, like that of a bullfinch. This appears to be one of those admirable provisions of Infinite Wisdom by which each created thing is adapted to the place for which it was intended. In picking up insects, or seeds which lie on hard iron-like lava, the superiority of such beaks over delicate ones, cannot, I think, be doubted; but there is, perhaps, another object in their being so strong and wide. Colnett says, p.59, 'they observed an old bird in the act of supplying three young ones with drink, by squeezing the berry of a tree into their mouths. It was about the size of a pea, and contained a watery juice, of an acid, but not unpleasant taste.' 'The leaves of these trees absorb the copious dews which fall during the night; the birds then pierce them with their bills for the moisture they retain, and which, I believe, they also procure from the various plants and evergreens.' 'The torch thistle contains a liquid in its heart, which the birds drank, when it was cut down. They sometimes even extracted it from the young trees by piercing the trunks with their bills.' For thus squeezing berries, and piercing woody fibre, or even only stout leaves, a slight thin beak would be scarcely available. Colnett observes,



that some of the birds which he saw resembled a few that he had seen at New Zealand, but as he also remarks that all the dead shells which he found upon the beach were familiar to him, I think one may suspect the accuracy of his eye, if not his memory, in those instances.

Mr Stokes made some notes about the tortoises (terrapin), while with me, and as he and I are satisfied as to the facts, I will add them. Fresh water was first discovered on Charles and on James Islands, by following the terrapin paths. These animals visit the low, warm ground to seek for food and deposit their eggs; but it must be a toilsome journey indeed for them to ascend and descend the rugged heights. Some that Mr Stokes saw in wet, muddy places, on high ground, seemed to enjoy themselves very much, shuffling and waddling about in the soft clayey soil near a spring. Their manner of drinking is not unlike that of a fowl: and so fond do they appear to be of water, that it is strange they can exist for a length of time without it; yet people living at the Galapagos say that these animals can go more than six months without drinking. A very small one lived upwards of two months on board the Beagle without either eating or drinking: and whale-ships have often had them on board alive for a much longer period. Some few of the terrapin are so large as to weigh between two and three hundred weight; and, when standing up on their four elephantine legs, are able to reach the breast of a middle-sized man with their snake-like head. The settlers at Charles Island do not know any way of ascertaining the age of a terrapin, all they say is, that the male has a longer neck than the female. On board the Beagle a small one grew three-eighths of an inch, in length, in three months; and another grew two inches in length in one year. Several were brought alive to England. The largest we killed was three feet in length from one end of the shell to the other: but the large ones are not so good to eat as those of about fifty pounds weight – which are excellent, and extremely wholesome food. From a large one upwards of a gallon of very fine oil may be extracted. It is rather curious, and a striking instance of the short-sightedness of some men, who think themselves keener in discrimination than most others, that these tortoises should have excited such remarks as ‘well, these reptiles never could have migrated far, that is quite clear,’ when, in simple truth, there is no other animal in the whole creation so easily caught, so portable, requiring so little food for a long period, and at the same time so likely to have been carried, for food, by the aborigines who probably visited the Galapagos Islands on their balsas, or in large double canoes, long before Columbus saw that twinkling light, which, to his mind, was as the keystone to an arch. Honest Dampier immediately reverted to the tortoises of the West Indies, and of Madagascar, when he saw those of the Galapagos. He had observed too many varieties caused by climate, soil, food, and habits, to entertain a doubt of their being other than a variety of the tortoise kind. As to the ‘guanoes’ they were, to his eye, familiar objects.

The currents about these islands are very remarkable, for in addition to their velocity, which is from two to five miles an hour, and usually towards the north-west, there is such a surprising difference in the temperature of bodies of water moving within a few miles of each other, that this subject must be reserved for further discussion. On one side of an island (Albemarle Island) we found the



temperature of the sea, a foot below the surface,  $80^{\circ}$  Faht; but at the other side it was less than  $60^{\circ}$ . In brief, those striking differences may be owing to the cool current which comes from the southward along the coasts of Peru and Chile, and at the Galapagos encounters a far warmer body of water moving from the bay of Panama, a sort of 'gulf stream'. The retentive manner in which such ocean rivers preserve their temperature has been frequently remarked: and must have a great effect upon the climates of countries near whose shores they flow.

*Narrative* 2 pp. 502-5

Her survey finished, the *Beagle* set sail on October 20th for the 4000 mile passage south-westwards across the Pacific to the Society Islands. After passing through the Tuamotu Archipelago between November 9th and 13th, Tahiti was reached early on November 15th. Later that day, Darwin and FitzRoy went ashore at Matavai Bay.

SUNDAY NOV. 15th. At daylight, Tahiti, an island which must for ever remain as classical to the Voyager in the South Sea, was in view. At this distance the appearance was not very inviting; the luxuriant vegetation of the lower parts was not discernible & the centre, as the clouds rolled past, showed the wildest & most precipitous peaks which can be well imagined. As soon as we got to an anchor in Matavai bay, we were surrounded by canoes. This was our Sunday but their Monday; if the case had been reversed we should not have received a single visit, for the injunction not to launch a canoe on the Sabbath is rigidly obeyed. After dinner we landed to enjoy all the delights of the first impressions produced by a new country – & that country the charming Tahiti. Crowds of men, women & children were collected on the memorable point Venus ready to receive us with laughing merry faces. They marshalled us towards the house of Mr Wilson the missionary of the district, who met us on the road & gave us a very friendly reception. (Neither the person or manners of Mr Wilson tend to give any idea of a high or devoted character but rather of a goodnatured quiet trader. I fully believe, however, from all which I heard & saw, that this exterior hides a great deal of most unpretending excellent merit. *del.*) After sitting a short time in the house we separated to walk about, but returned in the evening at tea-time.

The only ground cultivated or inhabited in this part of the Island is a strip of low flat Alluvial soil accumulated at the base of the mountains & protected by the reef of coral, which encircles at [a] distance the entire land. The whole of this land is covered by a most beautiful orchard of Tropical plants. In the midst of bananas, orange, cocoa-nut & Bread-fruit trees, spots are cleared, where Yams, sweet potatoes, sugar cane & pineapples are cultivated. Even the brushwood is a fruit tree, namely the guava, which from its abundance is noxious as a weed. In Brazil I have often admired the contrast of varied beauty in the banana, palm & orange trees; here we have in addition the Bread-fruit, conspicuous by its large, glossy & deeply digitated leaf. It is admirable to behold groves of a tree sending forth its branches with the force of an oak in England, loaded with large nutritious fruit. However little generally the utility explains the delight received from any fine



*Moorea*

prospect, in such cases as this it cannot fail largely to enter as an element in the feelings. The little winding paths, cool from the surrounding shade, lead to scattered houses. These have been too often described, for me to say anything about them: they are pleasant, airy abodes, but not quite so clean as I had been led to expect.

In nothing have I been so much pleased as with the inhabitants. There is a mildness in the expression of their faces, which at once banishes the idea of a savage, & an intelligence which shows they are advancing in civilization. No doubt their dress is incongruous, as yet no settled costume having taken the place of the ancient one. But even in its present state it is far from being so ridiculous as described by travellers of a few years' standing. Those who can afford it, wear a white shirt & sometimes a jacket, with a wrapper of coloured cotton round their middles, thus making a short petticoat like the Chilipa of the Gaucho. This appears so general with the chiefs, that probably it will become the settled fashion. They do not, even to the queen, wear shoes or stockings, & only the chiefs a straw hat on their heads. The common people when working, have the whole of the upper part of their bodies uncovered; & it is then that a Tahitian is seen to advantage. In my opinion, they are the finest men I have ever beheld; very tall, broadshouldered, athletic, with their limbs well-proportioned. It has been remarked that but little habit makes a darker tint of the skin more pleasing & natural to the eye of an European than his own color. To see a white man bathing



along side a Tahitian, was like comparing a plant bleached by the gardener's art, to the same growing in the open fields. Most of the men are tatooed; the ornaments so gracefully follow the curvature of the body that they really have a very elegant & pleasing effect. One common figure varying only in its detail, branches somewhat like palm leaves (the similarity is not closer than between the capital of a Corinthian column & a tuft of Acanthus) from the line of the back bone & embraces each side. The simile is a fanciful one, but I thought the body of a man was thus ornamented like the trunk of a noble tree by a delicate creeper. Many of the older people have their feet covered with small figures, placed in order so as to resemble a sock. This fashion is however partly gone by & has been succeeded by others. Here, although each man must for ever abide by the whim which reigned in his early days, yet fashion is far from immutable. An old man has his age for ever stamped on his body & he cannot assume the air of a young dandy. The women are also tatooed much in the same manner as the men & very commonly on their fingers. An unbecoming fashion in another respect is now almost universal; it is cutting the hair, or rather shaving it from the upper part of the head in a circular manner so as only to leave an outer ring of hair. The Missionaries have tried to persuade the people to change this habit, but it is the fashion & that is answer enough at Tahiti as well as Paris. I was much disappointed in the personal appearance of the women; they are far inferior in every respect to the men. The custom of wearing a flower in the back of the head or through a small hole in each ear is pretty. The flower is generally either white or scarlet & like the *Camelia Japonica*. The women also wear a sort of crown of woven cocoa nut leaves, as a shade to their eyes. They are in greater want of some becoming costume even than the men.

Hospitality is here universal. I entered many of their houses & everywhere received a merry pleasant welcome. All the men understand a little English; that is they know the names of common things; with the aid of this & signs, a lame sort of conversation could be carried on. After thus wandering about each his own way we returned to Mr Wilson's. In going afterwards to the boat we were interrupted by a very pretty scene, numbers of children were playing on the beach, & had lighted bonfires which illuminated the placid sea & surrounding trees: others in circles were singing Tahitian verses; we seated ourselves on the sand & joined the circle. The songs were impromptu & I believe relating to our arrival; one little girl sang a line, which the rest took up in parts, forming a very pretty chorus; the air was singular & their voices melodious. The whole scene made us unequivocally aware that we were seated on the shores of an Island in the South Sea.

*Diary pp. 344-7*

NOV. 18th. Mr Wilson went with me in a boat to Papiete, the most frequented harbour of Otaheite. We passed inside the reefs, by narrow twisting passages among the coral rocks. Seeing two marks set up on an extensive rocky flat, partially covered by the water, I concluded they were placed as beacons; but was



told they were tabu (taboo) marks to keep people from fishing or picking up shells upon the queen's 'preserve'. We passed the royal burying-ground, which is adorned by that peculiar tree, the aito, whose wood is so hard that it is called iron-wood. This tree looks like the English yew. It is purposely planted by the natives near their burying-grounds, and used to be considered sacred. Another remarkable tree, resembling (although larger and finer than) the ilex, also casts a solemn shade over the tomb of Pomare.

The point of land on which the tombs and one of the royal houses stand, is one of the most agreeable places on the island, in point of position; and was a favourite residence of old Pomare. A portion of their superstition hangs about the natives yet: I could not persuade them to approach the tomb of their king, although they told me to go and look at it. The tomb is a plain mass of masonry, sheltered by a roof of wood.

At Toanoa, between this place (called Papawa) and Papiete, we saw Mr Bicknell's sugar-mill. The sugar made there from native cane is of a very good quality, and cheap. Mr Bicknell told me that the natives brought their canes to him; and that latterly he had given up growing and attending to them himself. Noticing a large deficiency in some lead-work, he remarked: 'That lead was stolen in the last civil war; our books were then in high request, not to be read, but to make cartridges.' That such a sad misapplication of numbers of books sent out by missionary societies, has also occurred in New Zealand, as well as among the eastern Indian nations, I have heard from many quarters.

Papiete is a pretty and secure little bay. Around it is low land, ornamented with trees and European as well as native houses: but immediately behind the level part, hills rise to a height of two or three thousand feet. Lying to leeward of the island it enjoys less sea-breeze, and is therefore hotter than other harbours. In the middle of the bay is a little island belonging to the queen, where the colours of Otaheite (red, white, red, horizontal) are displayed.

Several neat-looking white cottages showed that European ideas had extended their influence hither: but I was sorry to see the new church, a large wooden structure capable of holding six hundred people, covered by a partly Otaheitan roof, in lieu of one formed completely in their own style. Instead of the circular end, an ugly gable terminates a high box-shaped house, resembling a factory.

Mr Pritchard arrived from Eimeo as we landed. Leaving him for a short time, I went to see a person who styled himself Baron de Thierry, King of Nuhahiva and sovereign chief of New Zealand. About the house in which resides this self-called philanthropist, said to be maturing arrangements for civilizing Nuhahiva and New Zealand – as well as for cutting a canal across the Isthmus of Darien – were a motley group of tattooed New Zealanders, half-clothed natives of Otaheite, and some ill-looking American seamen. I was received in affected state by this grandee, who abruptly began to question me with – 'Well, Captain! what news from Panama? Have the Congress settled the manner in which they are to carry my ideas into effect?' I tried to be decently civil to him, as well as to the 'baroness'; but could not diminish my suspicions, and soon cut short our conference.

In his house was a pile of muskets, whose fixed and very long bayonets had not



a philanthropic aspect. He had been there three months, and was said to be waiting for his ships to arrive and carry him to his sovereignty. Born in England, of French emigrant parents; his own account of himself was that he was secretary of legation to the Marquis of Marialva, at the congress of Vienna; and that in 1815 he belonged to the 23d Light Dragoons (English). In 1816 he was attaché to the French ambassador in London. In 1819 he was studying divinity at Oxford. In 1820-21, he was a student of laws at Cambridge. Afterwards he travelled on the continent: and lately had been sojourning in the United States. He visited and brought letters from the Governor of St Thomas, in the West Indies. He showed papers to prove these assertions: had a wife and four children with him; and he had succeeded in duping a great many people.

Mr Pritchard had seen the queen (by courtesy called Pomare, after her father, though her name was Aimatta) at Eimeo, the day before he arrived at Otaheite; and as she had not intimated an intention of coming thence, I agreed to go with him in a few days to pay my respects to her, and to make a formal application upon the subject of the *Truro*, a merchant vessel plundered and destroyed by the Low Islanders in 1830-31. I returned to Matavai in the evening, and, after landing Mr Wilson, remained nearly two hours listening to the natives singing. I asked them to dance; but they said it was forbidden, and that the watchman would take them to the governor of the district, who would fine them heavily. Singing, except hymns, is also forbidden to the grown people, but they seemed to like listening to the children.

This evening, before dark, there was a sight upon the *Beagle's* deck, which delighted us who wished to collect shells but had not time to look for them. An Englishman had spread out a large collection which he had just brought from the Low Islands, and soon found eager purchasers.

19th. We weighed anchor, and went into the little cove of Papawa, for the sake of watering quickly, without exposing the men and boats to a heavy surf. It is easy to avoid the numerous rocky patches, while there is a breeze, and the sun shining on either side, or astern; but if the sun is a-head, it is almost impossible to distinguish the reefs, by the colour, or relative smoothness of the water. Walking to the house of Mr Nott, I saw an elderly native writing in a cottage, and apparently very intent upon his employment. He showed me what had engaged his attention, an Otaheitan version of the book of Jeremiah, in Mr Nott's writing, which he was copying in a very distinct, good hand.

Mr Nott, the senior missionary upon the island, had then almost completed a great work, the translation of the Bible. When we consider the judgment and persevering industry required to translate the Bible from one written language into another, it becomes easier to obtain a fair conception of the labour necessary to fix, and make proper use of an unwritten, and very peculiar language, in order to effect such a work — a work worthy of the fathers of our church. I paid my respects to the author of this immense undertaking, and asked his advice and opinion respecting the affairs in which I was instructed to take a part, while on the island.

In the course of another visit to Papiete, I again met the titular king of





*Harbour of Papetoai*

Nuhahiva, and told him my suspicions, so plainly, that he said he should appeal to the governor of New South Wales, to the Admiralty, and to the king of England himself, against the unjust suspicions and improper conduct of the captain of the *Beagle*!

*Narrative* 2 pp. 14-17

23d. With Mr Henry (the son of the missionary) a well known chief, 'Hitote', came on board to share our breakfast. Captain Beechey has introduced him in his work and described his character. Mr Henry was born upon the island, and had never visited England, yet a more English countenance, or more genuine English ideas, I have seldom met with in any part of the world. From him I received some information, to me very interesting, and to those for whom it was my duty to collect nautical intelligence, I hope useful. Afterwards I hastened to Papiete to pay my respects to Queen Pomare. I was in time to see her arrive from Eimeo, sitting on the gunwale of a Whale-boat, loosely dressed in a dark kind of gown, without anything upon her head, hands, or feet, and without any kind of girdle or sash to confine her gown, which was fastened only at the throat. There was no reception





at landing: no attendance, no kind of outward ceremony showed that the 'Queen of the Isles' had arrived at her home.

Some time afterwards, when I heard that she was inclined to give an audience, I went to the royal cottage with Mr Pritchard. A parcel of half-dressed merry looking damsels eyed us with an amusing mixture of shyness and curiosity. These, I concluded, were a part of the 'Queen's mob', as our interpreter had ignorantly or democratically called the royal attendants. Only a few men were about the house, one of whom was the queen's foster-father ('feeding father' in the Otaheitan language) and another her husband.

Entering a small room, 'Ia-orana Pomare,' with a shake of the hand, was the salutation given by Mr Pritchard, and by myself, following his example. On the only three chairs in the room we sat down, but the queen looked very uncomfortable, and certainly not at all dignified. I could not help pitying her, for it was evident she was expecting a lecture on the subject of the Truro, and felt her utter helplessness: I was therefore glad, after a few words of compliment, to see her mother, husband, and foster-father enter the room, though they sat down upon chests or the floor,





*Queen Pomare's house*

I delivered a letter from Commodore Mason, which she asked Mr Pritchard to interpret, and sent out to her secretary. A meeting of the chiefs, herself presiding, was proposed and decided to be held on the following day. Some conversation then passed on other subjects, and we took our leave by shaking each individual by the hand. This is certainly preferable to pressing noses, but I was sorry to see that the missionaries had attended but little to the outward demeanour, to the manners, to the attendance, and to the dwelling of the sovereign of a people whose happiness and improvement would certainly be increased by raising the character, and improving the condition of their ruler. While called a queen, Pomare ought to be supported by some of those ceremonious distinctions, which have, in all ages and nations, accompanied the chief authority. That the missionaries should interfere harshly or sweepingly, would doubtless irritate; but a beneficial influence, almost unnoticed except in its effects, might be exerted in these temporal, and seemingly trifling affairs, which might assist hereafter in a day of need.

I have been told that the natives have been very ungrateful to the missionaries. Perhaps they are not all aware what a debt of gratitude they owe. Certainly, the better informed and the older inhabitants understand and appreciate the kindness and the labours of their devoted teachers; but whether the younger or the lightly-disposed have, generally speaking, a kindly feeling towards them I doubt. More temporal enjoyments, and more visible or tangible benefits are asked for by the



younger inhabitants, who are daily becoming more aware of the manners and habits of civilized nations. Surely the queen, a young and lively woman, is likely to compare her own habits and personal comforts, and the degrees of attention or deference shown to her, with those of foreigners, either resident in or visiting Otaheite.

Dispensing temporal benefits, with an evident desire to better their condition in every way, excites the gratitude of ignorant minds, and often paves the way towards teaching them to acquire abstract ideas, and to wage war against many of those things which they would rather do than leave undone. There is a Roman Catholic mission at the Gambier Islands, amply provided with presents and property fit for the natives, and it is said that they are succeeding well. At Otaheite the missionaries were afraid that the doctrines of the Roman church would obtain a greater influence, and agree better with the disposition of the natives than the strict discipline in which they have hitherto been held. Unless preventive measures are taken in Europe, religious strife and internal warfare may again be caused in these islands, even by those whose aim is peace. Already there is a remarkable bitterness of feeling on the subject, which is unlikely to diminish if the success of the Roman Catholic mission increases.

But I have wandered away from Pomare – her small ill-furnished room and her awkwardly-contrived house, neither English nor Otaheitan. Before she became sovereign, she was known by the name of Aimatta, which signifies ‘eye-eater’; but Pomare has since been adopted as the royal name. In affixing her signature, ‘Vahine’ is added, which means ‘female’ – thus ‘Pomare Vahine’. Her husband is a young, intelligent man; but he has no share in the government, being only king-consort. This man was the only native of the island, that I saw, whose nose was sharp and projecting. It is amusing to think that they call a man ‘long nose,’ in this country, when they wish to wound his feelings deeply.

During the first few days after a child is born, the mother or her attendants keep pressing the back of the infant’s head with one hand, and the forehead and nose with the other, to make the head high and the nose and brow flat. Children of the higher ranks undergo more compression, because they are more carefully attended. How the queen’s husband escaped, or could be chosen by her with such a nose, I am at a loss to discover.

24th. With all the officers who could be spared from the duty of the ship, Mr Darwin and I repaired early to Papiete. Mr Wilson, Mr Henry, and Hitote, were of the party. Arrived at the hospitable abode of Mr Pritchard, we waited until a messenger informed us of the queen’s arrival at the appointed place of meeting – the English chapel. From our position we had just seen the royal escort – a very inferior assemblage. It appeared that the chiefs and elderly people had walked to the chapel when our boats arrived, leaving only the younger branches of the community to accompany Pomare. The English chapel is a small, wooden structure, with a high, angular roof; it is about fifty feet in length and thirty feet wide; near the eastern end is a pulpit, and at each corner a small pew. The rest of the building is occupied by strong benches, extending nearly from side to side; latticed windows admit light and air; the roof is thatched in a partly Otaheitan



*Papetouai*

manner; none of the woodwork is painted, neither is there any decoration. Entering the chapel with my companions, I turned towards the principal pews, expecting to see Pomare there; but no, she was sitting almost alone, at the other end of the building, looking very disconsolate. Natives sitting promiscuously on the benches saluted us as we entered: order, or any kind of form, there was none.

The only visible difference between Pomare and her subjects was her wearing a gay silk gown, tied however round the throat, though entirely loose elsewhere; being made and worn like a loose smock-frock, its uncouth appearance excited more notice from our eyes than the rich material. In her figure, her countenance, or her manner, there was nothing prepossessing, or at all calculated to command the respect of foreigners. I thought of Oberea, and wished that it had been possible to retain a modified dress of the former kind. A light undergarment added to the dress of Oberea might have suited the climate, satisfied decency, and pleased the eye, even of a painter.

Disposed at first to criticise rather ill-naturedly – how soon our feelings altered, as we remarked the superior appearance and indications of intellectual ability shown by the chieftians, and by very many of the natives of a lower class. Their manner, and animated though quiet tone of speaking, assisted the good sense and apparent honesty of the principal men in elevating our ideas of their talents, and of their wish to act correctly.

Every reader of voyages knows that the chiefs of Otaheite are large, fine-



looking men. Their manner is easy, respectful, and a certain degree dignified; indeed on the whole surprisingly good. They speak with apparent ease, very much to the purpose in few words, and in the most orderly, regular way. Not one individual interrupted another; no one attempted to give his opinions, or introduce a new subject, without asking permission; yet did the matters under discussion affect them all in a very serious manner. Might not these half-enlightened Otaheitans set an example to numbers whose habits and education have been, or ought to have been, so superior?

It had become customary to shake hands with the queen, as well as with the chiefs. This compliment we were expected to pay; but it seemed difficult to manage, since Pomare occupied a large share of the space between two benches nearest to the wall, and the next space was filled by natives. However, squeezing past her, one after another, shaking hands at the most awkward moment, we countermarched into vacant places on the benches next in front of her. The principal chiefs, Utaame, Taati, Hitote, and others, sat near the queen, whose advisers and speakers appeared to be Taati and her foster-father. It was left for me to break the silence and enter upon the business for which we had assembled. Desirous of explaining the motives of our visit, by means of an interpreter in whom the natives would place confidence, I told Mitchell the pilot to request that Queen Pomare would choose a person to act in that character. She named Mr Pritchard. I remarked, that his sacred office ought to raise him above the unpleasant disputes in which the might become involved as interpreter. The missionaries had approached, and were living in Otaheite, with the sole object of doing good to their fellow-men, but I was sent in a very different capacity. As an officer in the service of my king, I was either to do good or harm, as I might be ordered; and it was necessary to distinguish between those who were, and ought to be always their friends, and men whose duty might be unfriendly, if events should unfortunately disappoint the hopes of those interested in the welfare of Otaheite. These expressions appeared to perplex the queen, and cause serious discussions among the chiefs. Before any reply was made, I continued: 'But if Mr Pritchard will undertake an office which may prove disagreeable, for the sake of giving your majesty satisfaction, by forwarding the business for which this assembly was convened, it will not become me to object; on the contrary, I shall esteem his able assistance as of the most material consequence.'

The queen immediately replied, through the chieftain at her right hand, Taati, that she wished Mr Pritchard to interpret.

Removing to a position nearer the queen and chiefs (he had been sitting at a distance), Mr Pritchard expressed his entire readiness to exert himself on any question which might affect the good understanding and harmony that hitherto had existed between the natives of Otaheite and the British; and he trusted that those persons present who understood both languages (Messrs Wilson, Bicknell, Henry, and others) would assist and correct his interpretations as often as they thought it necessary.

Commodore Mason's letter to me, authorizing my proceedings, was then read – in English, by myself – and translated by Mr Pritchard. Next was read an



agreement or bond, by which Queen Pomare had engaged to pay 2,853 dollars, or an equivalent, on or before the 1st day of September 1835, as an indemnification for the capture and robbery of the *Truro* at the Low Islands.

The queen was asked whether her promise had been fulfilled?

Taati answered, 'Neither the money nor an equivalent has yet been given.'

'Why is this?' I asked. 'Has any unforeseen accident hindered your acting up to your intentions; or is it not to be paid?'

Utaame and Hitote spoke to Taati, who replied, 'We did not understand distinctly how and to whom payment was to be made. It is our intention to pay: and we now wish to remove all doubts, as to the manner of payment.'

I observed, that a clear and explicit agreement had been entered into with Capt. Seymour; if a doubt had arisen it might have been removed by reference to the parties concerned, or to disinterested persons; but no reference of any kind had been made, and Mr Bicknell, the person appointed to receive the money, or an equivalent, had applied to the queen, yet had not obtained an answer.

I then reminded Pomare of the solemn nature of her agreement; of the loss which her character, and that of her chiefs, would sustain; and of the means England eventually might adopt to recover the property so nefariously taken away from British subjects, I said that I was on my way to England, where her conduct would become known; and if harsh measures should, in consequence, be adopted, she must herself expect to bear the blame.

These words seemed to produce a serious effect. Much argumentative discussion occupied the more respectable natives as well as the chiefs; while the queen sat in silence.

I must here remark, in explanation of the assuming or even harsh tone of my conduct towards Pomare, at this meeting, that there was too much reason for believing that she had abetted, if not in a great measure instigated, the piracy of the Paamuto people (or Low Islanders). For such conduct, however, her advisers were the most to blame. She was then very young; and during those years in which mischief occurred, must have been guided less by her own will than by the desires of her relations.

I had been told that excuses would be made; and that unless something like harshness and threatening were employed, ill effects, instead of a beneficial result, would be caused by the meeting: for the natives, seeing that the case was not taken up in a serious manner, and that the captain of the ship of war did not insist, would trouble themselves no farther after she had sailed away; and would laugh at those by whom the property was to be received.

The 'Paamuto', or Low Islands, where the piracies have occurred, in which she and her relations were supposed to have been concerned, were, and are still considered (though nominally given up by her), as under her authority and particular influence. Her father was a good friend to all the natives of those islands; and the respect and esteem excited by his unusual conduct have continued to the present time, and shown themselves in attachment to his daughter. So much hostility has in general influenced the natives of different islands, that to be well treated by a powerful chief, into whose hands a gale of wind, or warfare throws them, is a rare occurrence.





Moorea

The Paamuto Isles are rich in pearl oysters. Pomare, or her relations, desired to monopolize the trade. Unjustifiable steps were taken, actuated, it is said, by her or by these relations; and hence this affair.

They soon decided to pay the debt at once. Thirty-six tons of pearl oyster-shells, belonging to Pomare, and then lying at Papiete, were to form part of the equivalent; the remainder was to be collected among the queen's friends. Taati left his place near her, went into the midst of the assembly, and harangued the people in a forcible though humorous manner, in order to stimulate them to subscribe for the queen. After he had done speaking, I requested Mr Pritchard to state strongly that the innocent natives of Otaheite ought not to suffer for the misdeeds of the Low Islanders. The shells which had come from those ill-conducted people, might well be given as part of the payment; but the queen ought to procure the rest from them, and not from her innocent and deserving subjects. A document, expressing her intention to pay the remaining sum within a stated time, signed by herself and by two chiefs, with a certainty that the property would be obtained from the Low Islanders, would be more satisfactory than immediate payment, if effected by distressing her Otaheitan subjects, who were in no way to blame.

Taati replied, 'The honour of the queen is our honour. We will share her difficulties. Her friends prefer assisting her in clearing off this debt, to leaving her conduct exposed to censure. We have determined to unite in her cause, and endeavour to pay all before the departure of the man-of-war.'



It was easy to see that the other principal chiefs had no doubt of the propriety of the demand; and that they thought the queen and her relations ought to bear the consequences of their own conduct. Taati, who is related to her, exerted himself far more than Utaame, Hitote, or any of the others. This part of the business was then settled by their agreeing to give the shells already collected, such sums of money as her friends should choose to contribute, and a document signed by two principal chiefs, expressing the sum already collected and paid; and their intention of forthwith collecting the remainder, and paying it before a stipulated time. Difficulties about the present, as compared with the former value of the shells, were quickly ended by the arbitration; and their value estimated at fifty dollars per ton: the ready way in which this question about the value of the shells was settled, gave me a high idea of the natives' wish to do right, rather than take advantage of a doubtful point of law.

I next had to remark, that the queen had given up the murderers of the master and mate of the *Truro* in a merely nominal manner, and not in effect; and that she must expect to receive a communication upon that subject by the next man-of-war.

She asked me whether I really thought they would be required from her by the next man-of-war.

I replied: 'Those men were tried and condemned by the laws of Otaheite. Your majesty, as sovereign, exercised your right of pardoning them. I think that the British Government will respect your right as queen of these islands; and that his Britannic Majesty will not insist upon those men being punished, or again tried for the same offence; but the propriety of your own conduct in pardoning such notorious offenders, is a very different affair. It will not tend to diminish the effect of a report injurious to your character, which you are aware has been circulated.'

After a pause, I said, 'I was desired to enquire into the complaints of British subjects and demand redress where necessary.' No complaints had been made to me; therefore I begged to congratulate her majesty on the regularity and good conduct which had prevailed; and thanked her, in the name of my countrymen, for the kindness with which they had been treated.

I then reminded Pomare of the deep interest generally felt for those highly deserving and devoted missionaries, whose exertions, hazardous and difficult as they had been, and still were, had raised the natives of Otaheite to their present enlightened and improved condition; and that very reason united to demand for them the steady co-operation of both her and her chiefs. Finding that they listened attentively to Mr Pritchard's interpretation, which I was told was as good as it appeared to me fluent and effective, I requested permission to say a few words more to the queen – to the effect that I had heard much of her associating chiefly with the young and inexperienced, almost to the exclusion of the older and trustworthy counsellors whom she had around her at this assembly. To be respected, either at home or abroad, it was indispensably necessary for her to avoid the society of inferior minds and dispositions; and to be very guarded in her own personal conduct. She ought to avoid taking advice from foreigners, whom she knew not, and whose station was not such as might be a guarantee for their



upright dealings: and she ought to guard carefully against the specious appearances of adventurers whose intentions, or real character, it was not possible for her to discover readily. Such men could hardly fail to misinform her on most subjects; but especially on such as interested themselves; or about which they might entertain the prejudices and illiberal ideas which are so prevalent among ignorant or ill-disposed people. I tried to say these things kindly, as the advice of a friend: Pomare thanked me, acknowledged the truth of my remarks, and said she would bear them in mind.

Turning to the chiefs, a few words passed, previous to Taati asking me, in her name, 'Whether they were right in allowing a foreigner to enlist Otaheitans to serve him as soldiers; and in permitting them and other men to be trained, for warlike purposes, upon their island?' My reply was, 'If Otaheitan subjects, so trained, almost under the queen's eye, act hostilely against the natives of any other island, will not those natives deem her culpable? To my limited view of the present case, it appears impolitic, and decidedly improper to do so.' After a few words with Utaame and Hitote, Taati rose and gave notice that no Otaheitan should enlist or be trained to serve as a soldier, in a foreign cause. By this decree de Thierry lost his enlisted troops, except a few New Zealanders, and whaling seamen.

One of the seven judges, an intelligent, and, for an Otaheitan, a very well educated man, named 'Mare', asked to speak to me. 'You mentioned, in the third place,' said Mare, 'that you were desired to enquire into the complaints of British subjects, and demand redress, if necessary. You have stated that no complaint has been made, and you have given us credit for our conduct: allow me now to complain of the behaviour of one of your countrymen, for which we have failed in obtaining redress.' Here Mare detailed the following case of the 'Venilia', and said that no reply to their letter to the British government, had yet been received. Mare then added, in a temperate though feeling manner, 'does it not appear hard to require our queen to pay so large a sum as 2,853 dollars out of her small income; while that which is due to her, 390 dollars, a mere trifle to Great Britain, has not obtained even an acknowledgment from the British government?'

I ventured to assure Mare that some oversight, or mistake, must have occurred, and promised to try to procure an answer for them, which, I felt assured, would be satisfactory.

*Narrative* 2 pp. 524-35

Reverting to the meeting at Papiete: The queen's secretary next asked to speak, and said that a law had been established in the island, prohibiting the keeping, as well as the use or importation of any kind of spirits. In consequence of that law, the persons appointed to carry it into effect had desired to destroy the contents of various casks and bottles of spirits; but the foreigners who owned the spirits objected, denying the right to interfere with private property. The Otaheitan authorities did not persist, as they were told that the first man-of-war which might arrive would certainly take vengeance upon them if they meddled with private property. He wished to ask whether the Otaheitans ought to have persisted in



enforcing their own laws; and what I should have done, had the law been enforced with a British subject, and had he made application to me.

My answer was, 'Had the Otaheitans enforced their law, I could in no way have objected. In England a contraband article is seized by the proper officers, and is not treated as private property while forbidden by the law.'

Much satisfaction was evidently caused by this declaration: also, at a former part of the discussions, when a remonstrance was made against Otaheitans paying the Truro debt, the greater part of the assembly seemed to be much pleased.

A respectable old man then stood up, and expressed his gratification at finding that another of King William's men-of-war had been sent – not to frighten them, or to force them to do as they were told, without considering or inquiring into their own opinions or inclinations, but to make useful enquiries. They feared the noisy guns which those ships carried, and had often expected to see their island taken from them, and themselves driven off, or obliged in their old age to learn new ways of living.

I said, 'Rest assured that the ships of Great Britain never will molest Otaheitans so long as they conduct themselves towards British subjects as they wish to be treated by Britons. Great Britain has an extent of territory, far greater than is sufficient for her wishes. Conquest is not her object. Those ships, armed and full of men, which from time to time visit your island, are but a very few out of a great many which are employed in visiting all parts of the world to which British commerce has extended. Their object is to protect and defend the subjects of Great Britain, and also take care that their conduct is proper – not to do harm to, or in any way molest those who treat the British as they themselves would wish to be treated in return.'

I was much struck by the sensation which these opinions caused amongst the elderly and the more respectable part of the assemblage. They seemed surprised, and so truly gratified, that I conclude their ideas of the intentions of foreigners towards them must have been very vague or entirely erroneous.

The business for which we had assembled being over, I requested Mr Pritchard to remind the queen, that I had a long voyage to perform; and ought to depart from her territories directly she confided to me the promised document, relating to the affair of the Truro; and I then asked the queen and principal chiefs to honour our little vessel by a visit on the following evening, to see a few fireworks: to which they willingly consented: some trifling conversation then passed; and the meeting ended.

Much more was said, during the time, than I have here detailed: my companions were as much astonished as myself at witnessing such order, so much sensible reasoning, and so good a delivery of their ideas! I shall long remember that meeting at Otaheite, and consider it one of the most interesting sights I ever witnessed. To me it was a beautiful miniature view of a nation emerging from heathen ignorance, and modestly setting forth their claims to be considered civilized and Christian.

We afterwards dined with Mr Pritchard, his family, and the two chiefs, Utaame and Taati. The behaviour of these worthies was extremely good; and it was very



gratifying to hear so much said in their favour by those whose long residence on the island had enabled them to form a correct judgment. What we heard and saw showed us that mutual feelings of esteem existed between those respectable and influential old chieftains and the missionary families.

It was quite dark when we left Papiete to return, by many miles among coral reefs, to the Beagle; but our cat-eyed pilot undertook to guide our three boats safely through intricate passages among the reefs, between which I could hardly find my way in broad daylight, even after having passed them several times. The distance to the ship was about four miles; and the night so dark, that the boats were obliged almost to touch each other to ensure safety; yet they arrived on board unhurt, contrary to my expectation; for my eyes could not detect any reason for altering our course every few minutes, neither could those of any other person, except the pilot, James Mitchell. Had he made a mistake of even a few yards, among so many intricate windings, our boats must have suffered (because the coral rocks are very sharp and soon split a plank), though in such smooth and shallow water, a wrong turning could have caused inconvenience only to ourselves, for there was little or no danger of more than a wetting.

*Narrative* 2 pp. 540-2

Taking leave of the queen was our next engagement. At the door of her house was a table, on which the loyal and kindhearted natives were depositing their dollars, and fractions of dollars: to enable her to pay the debt. To me it was an affecting and an unpleasing sight – not the proofs of loyalty and affection – Heaven forbid! – but the reflection that those individuals had in no way done wrong, and that their dollars had been hardly earned and were highly prized. To show how little a metallic currency was then understood, I may mention that many individuals wished to subscribe fractions, who could not afford a whole dollar; but they were prevented, at first, because the collector knew not how to reckon a fraction of a dollar. Mr Pritchard easily explained this, and then the smaller coins, (rials, and two rial pieces,) were soon numerous upon the table. Frequently, while walking about the island, men had asked me to give them a dollar in exchange for its value in small coin, which, to their surprise, I was always glad to do, when I had dollars with me.

About Pomare was rather a large assemblage of maids of honour, but their postures and appearance, as they sat about upon the floor, were not the most elegant. The contrast between our own neatly dressed, and well-mannered countrywomen, whom we had just left in the house of Mr Pritchard, was rather striking as compared with these brown and oily Otaheitans: but our visit was not long, and we tried to make it agreeable. Returning by the beach, we talked for some time with Taati, Utaame, and others. Old Ua was there also, to thank me for some trifles sent to him by one of the queen's maidens, who had attended her when on board the Beagle; and I was glad to hear that the damsel had executed her commission in a most punctual manner.

They expressed great anxiety about the arrival of another man-of-war, with, perhaps, harsher orders: and were very desirous to know when I should arrive in



England, and when they would hear from me. I endeavoured to satisfy them on these points, before Mr Darwin and I wished them farewell (in the most earnest meaning of the word) and, after taking leave of Mr Pritchard's family, embarked. Mare and Mr Pritchard accompanied us to the vessel, then under sail outside the reefs, wished us a great deal more happiness than most of us will probably enjoy, and returned with Mr Henry and the pilot in their own boats. We made all sail, and soon lost sight of this beautiful island.

Easterly winds swept us along a smooth sea for many days, after leaving Otaheite. At daylight on the 3d of December we saw Whylootacke (or Wailutaki) a small group of islets encircled by a coral reef, from four to eight miles in diameter. The principal one is 360 feet high, and nearly four miles long. There was a native missionary upon it, educated at Otaheite. On the 11th a few white tern were seen near the ship (in lat.  $28^{\circ}$ .S. and long.  $180^{\circ}$ ) and as she was about 120 miles from any land then known, this notice may help to show within what limits the sight of those birds may be considered to indicate the vicinity of land. I am not at all surprised that the early voyagers should have taken so much notice of the appearance and flight of birds, when out of sight of land; since in my very short experience I have profited much by observing them, and I am thence led to conclude that land, especially small islands or reefs, has often been discovered in consequence of watching particular kinds of birds, and noticing the direction in which they fly, of an evening, about sunset. Short winged birds, such as shags or boobies, seldom go a hundred miles from land, and generally return to their accustomed roosting place at night; and even those with longer wings which fly farther, do not habitually remain on the wing at night, though they are known to do so sometimes, especially if attracted by a ship, on which, doubtless, they would perch if she were to remain motionless, and her crew were to be quiet for a short time. Mistakes may occur in consequence of floating carcasses, trunks of trees, wrecks of vessels, or drifting seaweed, all which attract birds and afford them rest at night; but, generally speaking, if there is land within fifty miles of a vessel, its existence will be indicated, and the direction in which to look will be pointed out by birds. Decided oceanic fowl, such as albatrosses and all the petrel family, sleep upon the surface of their favourite element; therefore the flight of that description of bird can be no guide whatever, except in the breeding season, when they frequent the vicinity of land.

Until I became aware of these facts, the discovery of the almost innumerable islands in the great ocean of Magalhaens (erroneously, though now probably for ever called Pacific,) caused great perplexity in my mind. That Easter Island, for instance, such a speck in the expanse, and so far from other land, should have been – not only discovered – but repeatedly visited and successively peopled, by different parties of the human family, seemed extraordinary, but now, connecting the numerous accounts related by voyagers of canoes driven hundreds of miles away from their desired place, with these facts respecting birds, much of the mystery seems unravelled.

Every one is well aware that uncivilized man is more attentive to signs of weather, habits of animals, flight of the feathered tribe, and other visible objects,



important to his very existence, than his educated brother, who often diminishes the perceptive faculties of the mind, while he strengthens the power of reflection and combination.

*Narrative* 2 pp. 556-8

The negotiations with Queen Pomare completed, the *Beagle* set sail from Papeete on November 26th. North Island of New Zealand was sighted on December 19th, and two days later the *Beagle* anchored in the Bay of Islands, near its northern tip. Here they remained for a week.

[DEC. 21] My first impression, upon seeing several New Zealanders in their native dress and dirtiness was, that they were a race intermediate between the Otaheitans and Fuegians; and I afterwards found that Mr Stokes and others saw many precise resemblances to the Fuegians, while every one admitted their likeness to the Otaheitans. To me they all seem to be one and the same race of men, altered by climate, habits, and food; but descended from the same original stock.

Of a middle size, spare, but strong frame, and dark complexion, the New Zealander's outward appearance is much in his favour; hardiness and activity, as may be expected, he eminently possesses. The expression of his features indicates energy, quickness of apprehension, without much reflection; and a high degree of daring. Ferocity is a striking trait in the countenances of many among the older men, and it is increased considerably by the savage style in which their faces are disfigured, or, as they think, ornamented by lines cut in the skin with a blunt-edged iron tool, and stained black. These lines are certainly designed with as much taste, even elegance, as could possibly be exerted in such disfiguring devices. The expression which, it appears, is anxiously desired, is that of a demon-warrior. All their old ideas seem to have had reference to war. Well might the Spanish poet's description of the Araucanians have been applied to the New Zealanders in their former condition:

Venus y Amor aqui no alcanzan parte,  
Solo domina el iracundo Marte!

The lines upon the face are not, however, arbitrary marks, invented or increased at the caprice of individuals, or the fancy of the operator who inflicts the torture; they are heraldic ornaments, distinctions far more intelligible to the natives of New Zealand than our own armorial bearings are to many of us, in these unchivalric days. Young men have but few: slaves, born in bondage, or taken young, have scarcely any marks; but the older men, especially the more distinguished chiefs, are so covered with them that the natural expression of face is almost hidden under an ornamented mask. One object of the tattowing, is to prevent change of features after middle age. Some of the women, whom the missionaries endeavoured to persuade not to follow this practice, said, 'Let us have a few lines on our lips, that they may not shrivel when we are old.'

Every one has heard of, and many people have seen the war-dance. What exaggerated distortions of human features could be contrived more horrible than those they then display? What approach to demons could human beings make





*New Zealanders*



nearer than that which is made by the Zealanders when infuriating, maddening themselves for battle by their dance of death!

The hair of a New Zealander is naturally luxuriant, though rather coarse; its rough, free curliness in an unadorned, almost untouched state, heightens that expression of untameable ferocity which is so repulsive in the older men, especially in those of inferior degree. Many of the young women are good-looking; and they dress their hair with some pains, and not a little oil.

Although cannibalism and infanticide have ceased in the northern parts of New Zealand, the aboriginal race is decreasing. The natives say frequently, 'The country is not for us; it is for the white men!' and they often remark upon their lessening numbers. Change of habits, European diseases, spirits, and the employment of many of their finest young men in whale-ships (an occupation which unhappily tends to their injury), combine to cause this diminution. Wearing more clothes (especially thick blankets), exposes them to sudden colds, which often end fatally. We were surprised at seeing almost every native wrapped up in a thick blanket, perhaps even in two or three blankets, while we were wearing thin clothing.

The countenances of some of the men (independent of the tattowing) are handsome, according to European ideas of line beauty. Regular, well-defined, and high features are often seen; but they are exceptions, rather than the usual characteristics. Generally speaking, the New Zealander has a retreating and narrow forehead — rather wide, however, at the base; a very prominent brow; deeply-sunk black eyes, small and ever restless; a small nose, rather hollow, in most cases, though occasionally straight or even aquiline, with full nostrils; the upper lip is short, but that and the lower are thick; the mouth rather wide; white and much blunted teeth; with a chin neither large nor small, but rather broad. Some have higher and better heads, and a less marked expansion of brow, nostrils, and lips; others, again, are the reverse: usually, their eyes are placed horizontally; but some are inclined, like those of the Chinese, though not remarkably; indeed not so much so as those of a Scotchman whom I met there. Among the women I noticed a general depression of the bridge of the nose, and a flat frontal region.

Few engravings, or paintings, show the real expression, features, or even colour of the Polynesian tribes. They give us a half naked, perhaps tattooed man or woman; but the countenance almost always proves the European habits of the artist. The features have a European cast, quite different from the original, and the colouring is generally unlike; especially in coloured engravings.

The general complexion of both women and men is a dark, coppery-brown; but it varies from the lightest hue of copper to a rich mahogany or chocolate, and in some cases almost to black. The natural colour of the skin is much altered by paint, dirt, and exposure. Before closing this slight description of the personal appearance of the Zealanders, I must allude to the remarkable shape of their teeth. In a white man the enamel usually covers all the tooth, whether front or double; but the teeth of a man of New Zealand are like those of the Fuegians, and at a first glance remind one of those of a horse. Either they are all worn down — canine, cutting-teeth, and grinders — to an uniform height, so that their interior texture is



quite exposed, or they are of a peculiar structure.

The New Zealanders' salutation has often been talked of as 'rubbing noses,' it is, in fact, touching, or crossing them; for one person gently presses the bridge of his nose across that of his friend. Mr Darwin informed me that when a woman expects to be saluted by a person of consequence, in the 'nose pressing' manner, she sits down and makes a droll grunting noise, which is continued, at intervals, until the salute has been given.

The usual manner of the native is very inferior. Accustomed to a low, wretched dwelling, and to crouching in a canoe, his habitual posture of rest is squatting on his hams, or upon the ground, with his knees up to his chin; hence, also, his limbs are rather inferior in their shape. But arouse his spirit, set him in motion, excite him to action, and the crouching, indolent being is suddenly changed into an active and animated demoniac. The Zealander is extremely proud; he will not endure the slightest insult. A blow, even in jest, must be returned!

Every one has seen or heard so much of their weapons and canoes, that it is almost superfluous to speak of them; yet, in examining one of their larger canoes – seventy feet in length, from three to four in width, and about three in depth – I was much interested by observing what trouble and pains had been taken in building and trying to ornament this, to them, first-rate vessel of war. Her lower body was formed out of the trunk of a single tree – the New Zealand kauri, or cowrie – the upper works by planks of the same wood; the stem and stern, raised and projecting, like those of the galleys of old, were carved and hideously disfigured, rather than ornamented, by red, distorted faces with protruding tongues and glaring mother-of-pearl eyes. Much carving of an entirely different and rather tasteful design decorated the sides. Beneath the 'thwarts,' a wicker-work platform, extending from end to end, served to confine the ballast to its proper position, and to afford a place upon which the warriors could stand to use their weapons. From forty to eighty men can embark in such canoes. But their day is gone! In a few years, scarcely a war-canoe will be found in the northern district of New Zealand.

Judging only from description, the largest canoes ever seen by the oldest of the present generation, must have been nearly ninety feet in length; formed out of one tree, with planks attached to the sides, about six or seven feet wide, and nearly as much in depth. Several old men agreed, at different times, in this account; but perhaps each of them was equally inclined to magnify the past.

New Zealand much requires assistance from the strong but humane arm of a powerful European government. Sensible treaties should be entered into by the head of an over-awing European force, and maintained by the show, not physical action, of that force until the natives see the wonderful effects of a changed system. Finding that their protectors sought to ameliorate their condition, and abolish all those practices which hunger, revenge, and ignorance probably caused, and alone keep up; that they neither made them slaves, nor took away land without fair purchase; and that they did no injury to their country, or to them, except in self-defence – even then reluctantly – would give the natives satisfaction and confidence, and might, in a few years, make New Zealand a



powerful, and very productive country. I say powerful, because its inhabitants are very numerous, and have in themselves abundant energy, with moral, as well as physical materials; productive also, because the climate is favourable; the soil very rich; timber plentiful, and very superior; minerals are probably plentiful; flax is a staple article; corn and vines are doing well; and sheep produce good wool.

*Narrative* 2 pp. 567–72

DEC. 26th. Disputes between masters of whale ships and their crews, and between both these classes and the New Zealanders, obliged me to meddle, though very reluctantly, in their affairs. To show what anarchy has been caused in this country, by the partial, half measures, which have been taken, I will try to describe the state of things, at the Bay of Islands. as we found them.

I will not attempt to give the slightest sketch of events which had occurred anterior to the Beagle's visit, full and authentic details being accessible in other publications; farther than to say that the rumoured approach of de Thierry had stimulated Mr Busby (holding the undefined office of British resident) to take measures adverse to such foreign intruders, by issuing a public announcement, and by calling together the principal chiefs of tribes inhabiting the districts of New Zealand, north of the Thames, with a view of urging them to frame a sort of constitution, which should have a steadying influence over their unwieldy democracy, and leave them less exposed to foreign intrusion.

Thus much had been done by words and on paper; the chiefs had departed, each to his perhaps distant home, and the efficiency of their authority, in a 'collective capacity' was yet to be discovered. No 'executive' had been organized; the former authorities – each chief in his own territory – hesitated to act as they had been accustomed, owing to a vague mystification of ideas, and uncertainty as to what they really had agreed upon, while the authority of Mr Busby was absolutely nothing, not even that of a magistrate among his own countrymen; so of course he could have no power over the natives. To whom then were the daily squabbles of so mixed and turbulent a population, as that of the Bay of Islands and its vicinity, to be referred?

Late events had impressed the natives with such a high idea of King William's men-of-war, that even the little Beagle was respected by them, and, in consequence, appeals were made to me – by natives, by men of the United States of America, and by British subjects; but, not then aware of the peculiarity of Mr Busby's position, I referred them to him, under the idea that his office was of a consular nature, and therefore that I ought not to act in these cases, excepting as his supporter. Finding him unwilling to take any steps of an active kind, not deeming himself authorised to do so: and the aggrieved parties still asking for assistance, I referred them to the only real, though not nominal, authority, in the place, that of the missionaries. By the active assistance of Mr Baker, the more serious quarrels were ended without bloodshed, and those of a more trifling nature, in which the natives were not concerned, were temporarily settled: but I doubt not that in a few days afterwards anarchy again prevailed.



To give an idea of the nature of some of these quarrels, and of the serious consequences they might entail, I will describe briefly two or three cases which were referred to me.

Pomare had been beaten while on board a whale ship, by some of her crew. No New Zealander will submit to be struck, but thus to treat a chief is unpardonable. Burning with indignation he maltreated the first Englishman whom he met on shore, and was concerting serious measures of revenge, when the master of the ship, and a number of his men, came to ask for assistance and protection.

Again; a chief, whose name I do not know, had been refused admittance on board a whale ship, where he had heard that one of his female slaves was living. He did not wish to injure her, or even take her away. His only motive, in asking admittance, was to satisfy himself that she was there. Highly affronted at the refusal, he spoke to me (as he said) previously to collecting his warriors and attacking the ship.

Another case was unconnected with the natives, but tended to expose a fraudulent system, and to show the necessity of arming British authorities, in distant parts of the world, with a definite degree of control over the licentious, or ill-disposed portion of their own countrymen, who, in those remote regions, are disproportionably numerous, and now able to do pretty much what they please.

A person who stated himself to be the master of an English whaler, lying in the harbour, came on board the *Beagle*, accompanied by a man said to be the third mate. The former complained of the mutinous state of his crew, who had ill treated this third mate, and then refused to work or obey any orders. Inquiry on board the whaler, showed that the crew had been ill-used, especially as to provisions: and that not only the nominal master, but the chief as well as the second mate were North Americans (U.S.). The legal master, it appeared, was the so-called third mate, an Englishman. His name appeared in the ship's papers as master; that of the person who had been acting as master did not appear at all. But the acting master, who before me styled himself 'supercargo,' produced a power of attorney from the owners of the vessel, which appeared to authorise him to control the proceedings of the vessel, as he thought proper; to displace the master and appoint another person in his stead, and in every way to act for the owners, as if he, the American, were sole owner. Nearly all the seamen were British subjects. How far his power of attorney might carry weight against the spirit and intent of the navigation laws, I had much doubt; but as it appeared to me that the owners in such cases, ought to know their own interest better than other persons could; and that in suiting their own interest they certainly would add their mite towards the general interest of their country; and as the supercargo had a circular letter from the Commander-in-chief on the West-India and North American station, asking for the assistance of any King's ship he might meet (with the view of encouraging the whale fishery out of Halifax); I refrained from doing what my first impulse prompted – putting an officer on board, and sending the ship to the nearest port (Sydney), in which correctly legal measures might be adopted, if necessary. Meanwhile as the British resident did not think himself authorised to interfere, and disorder, with 'club-law', were prevailing and likely to continue, in the *Rose*,



I went on board, accompanied by Lieutenant Sullivan and Mr Bynoe. After examining the provisions and all the ship's papers, I spoke to the crew (every man of whom wished to leave the vessel) and to the nominal master; obtained an assurance, in their hearing, that their future allowance of provisions should be unobjectionable, and, for the time, restored order. But I felt that the calm was unlikely to last, and two days afterwards fresh appeals were made, to which I could not attend, being in the act of leaving the port.

The laws which regulate our merchant shipping, especially sealers and whalers, do not appear to extend a sufficient influence over the numerous vessels, which, with their often turbulent inmates, now range over the vast Pacific. For many years past, Great Britain and the United States have annually sent hundreds of large whale ships into the Pacific: during late years, Sydney has sent forth her ships, amounting at present in number to more than sixty, most of which are employed in whaling or trading in the Pacific: and be it remembered that their crews are not the most select seamen – the nature of many of them may easily be imagined – yet in all this immense expanse of ocean, little or no restraint except that of masters of vessels, on board their own ships, is imposed either upon Americans or British subjects! There is the nominal authority of a consul at the Sandwich, and Society Islands: and occasionally a man-of-war is seen at the least uncivilized places. But how inefficient is so widely separated, and so nominal a control? When ships of war visit the less frequented parts of the Pacific, they are too much in the dark, as to the state of things, to be able to effect a tenth part of what might be done, in equal time, by a ship employed solely on that ocean. In so peculiar a portion of the world as Polynesia, it takes some time to learn what has been taking place: and what ship of war has stayed long enough for her captain to lose the sensation of inexperience – which must embarrass him if called upon to decide and act, in cases where he really is about the most ignorant person (as regards the special case) of any one concerned with it? In consequence of that ignorance, he must inevitably be more or less guided by the advice of parties, of whose individual interest in the matter so short an acquaintance cannot give him a proper idea.

A great deal of prudence, and good management, is required in the commander of a man-of-war, who has any business of consequence to transact with the natives of Polynesia, or who has to deal with his own countrymen in that distant region. A single ship, assisted perhaps by tenders, might, if well commanded, do more good in a few years among the islands of the Pacific, than can now easily be imagined. But then she must be stationary; not that she should remain in one place – far from it – her wings should seldom rest; I mean only that she should stay in the Pacific during three or four years. In that time so much information might be gained, and so much diffused among the natives; such a system of vigilant inspection might be established, and so much respect for, and confidence in the British nation, be secured – that our future intercourse with Polynesia would, for a length of time, be rendered easier and infinitely more secure, as well as creditable.

The few ships of war which have remained during any length of time among



the islands, have been occupied by exploring and surveying, to an extent that has interfered with the earnest consideration of other matters. But in a ship, employed as I have described, a surveyor might be embarked, who would have ample opportunities of increasing our knowledge of that ocean. And if a sensible man, whose natural ability had been improved by an education unattainable by sailors, could be tempted to bear the trials and losses of a long sea voyage, in a busily employed ship, how much might Science profit by the labours of three or four such years?

Having thus entered freely into ideas which I have so often dwelt upon that they are become familiar, I will venture to suggest the kind of ship which would do most, in my humble opinion, at the least ultimate expense consistent with efficiency. Moral influence over the minds of natives, as well as over wanderers from our own or other countries, is a primary object, and that influence might be at once obtained by the mere presence of a large ship.

Compare the manner in which the natives of the Marquesas behaved to the *Tagus* and *Briton* frigates, with their hostility to vessels whose appearance did not overawe them. An outward show of overpowering force would often prevent a struggle, and probably loss of life, which, however justifiable, cannot too anxiously be avoided. From what I have seen and heard, I feel authorised to say that one ship of force, well-manned, and judiciously commanded, would effect more real good in the Pacific than half-a-dozen small vessels.

Frigates have already been seen among some of the islands of Polynesia, and heard of in the greater number. To send a ship of a lower class to establish a general influence over the Polynesians, and our own wandering countrymen, as well as for the purposes I have previously mentioned, would be to treat the business so lightly that, for the credit of our country, it would perhaps be better let alone; particularly as a frigate does occasionally go from the South American station, and a sloop from Australia, or the East-Indies. No European or American nation has now a duty to perform, or an interest to watch over, in the Pacific Ocean, equal to that of Great Britain. The North Americans are increasing their connections, and consequently their influence, rapidly. Russia has extended her arm over the Northern Pacific. France has sent her inquiring officers, and Roman Catholic missionaries are sowing the seeds of differences, if not discord, among the islanders, in the Gambier Islands and elsewhere.

Independent of expense, what are the principal local objections to employing a frigate in such a duty? In the first place, among the islands there would be risk of getting ashore, increasing with the size of the ship: in the second, it might be difficult to obtain supplies, and in the event of losing spars she might be obliged to return, perhaps to England: in the third, to get ashore, in a ship drawing so much water, would be a much more serious affair than a similar accident happening to a smaller vessel: and, by obliging her to return to England, or go to an East-Indian dockyard, would upset all plans and expose Polynesia to greater irregularities and less control than ever, until new arrangements could be made.

To the 'risk of getting ashore,' I answer: large ships are in general more efficiently officered and manned than small ones, and they are less likely to get into



danger, because they are consequently more carefully managed. The Pacific is, technically speaking, a 'deep water' ocean: all its coral reefs are 'steep-to'. Sand or mud banks are unknown, except near the shores of continents, and even there they are rare, unless on the Japanese and Chinese shores. Small ships attempt to sail in intricate passages, and get ashore: large vessels use warps, or await very favourable opportunities, and are not risked. Secondly: supplies may now be obtained in any quantity on the coast of South America, as well as in Australia; and fresh provisions can be obtained by regular, reasonable purchase, at the principal islands. New Zealand, Norfolk Island, the north-west coast of America and other places, are stocked with the finest spars: and lastly: a large ship, well provided, has the resources of a small dock-yard within herself.

An East-India trader of eight hundred tons, was hove down by her own crew, and the natives, at Otaheite. Cook laid his ship ashore for repair in Endeavour River, on the north-east coast of New Holland; where the rise and fall of tide is very great. Sydney is an excellent place for heaving down and repairing a ship of any size. Guayaquil has a great rise and fall of tide. Lima, or rather Callao, and Coquimbo, are good places for a ship to refit in. But Sydney is superior to all as a rendezvous, and any repairs may be effected there.

Large ships are able to do all their own work, while small vessels are frequently obliged to ask for the help of their neighbours, when they get into difficulty, or want repairs. These considerations, however, should not prevent a frigate from having a good tender, for much risk would then be avoided: and although the large ship might be repairing, the knowledge that she was in the Pacific would be quite sufficient, if she had only established such a character as that which was borne by many a British frigate during the last general war. Such a ship could detach efficient boats for surveying, or other purposes; she could carry animals, seeds, plants, and poultry, to those islands which have none; and by her countenance and protection, she could assist and encourage the missionaries in their all-important occupation.

*Narrative* 2 pp. 589-97

C.D. TO MISS CAROLINE DARWIN

Bay of Islands - New Zealand. Decemb 27th 1835

My dear Caroline,

My last letter was written from the Galapagos, since which time I have had no opportunity for sending another. A Whaling Ship is now going direct to London, & I gladly take the chance of a fine rainy Sunday evening of telling you how we are getting on. You will see we have passed the Meridian of the Antipodes & are now on the right side of the world. For the last year I have been wishing to return, & have uttered my wishes in no gentle murmurs; but now I feel inclined to keep up one steady deep growl from morning to night. I count & recount every stage in the journey homewards, & an hour lost is reckoned of more consequence than a week formerly. There is no more Geology but plenty of sea-sickness; hitherto the pleasures & pains have balanced each other; of the latter there is yet an abundance, but the pleasures have all moved forwards & have reached



Shrewsbury some eight months before I shall. If I can grumble in this style now that I am sitting, after a very comfortable dinner of fresh pork & potatoes, quietly in my cabin, think how aimiable I must be when the Ship in a gloomy day is pitching her bows against a head Sea. Think & pity me. But everything is tolerable when I recollect that this day eight months I probably shall be sitting by your fireside.

After leaving the Galapagos, that land of Craters, we enjoyed the prospect, which some people are pleased to term sublime, of the boundless ocean for five & twenty entire days. At Tahiti we staid 10 days, & admired all the charms of this almost classical Island. The kind simple manners of the half civilized natives are in harmony with the wild & beautiful scenery. I made a little excursion of three days into the central mountains. At night we slept under a little house made by my companions from the leaves of the wild Banana. The woods cannot be compared to the forests of Brazil; but their kindred beauty was sufficient to awaken those most vivid impressions made in the early part of this voyage. I would not exchange the memory of the first six months, not for five times the length of anticipated pleasures. I hope & trust Charlotte will be enthusiastic about tropical scenery; how I shall enjoy hearing from her own lips all her travels. I do not clearly understand from your last letters, whether she has actually gone to Rio, or only intends doing so.

But I must return to Tahiti, which charming as it is, is stupid when I think about all of you. The Captain & all on board (whose opinions are worth anything), have come to a very decided conclusion on the high merit of the Missionaries. Ten days no doubt is a short time to observe any fact with accuracy, but I am sure we have seen that much good has been done, & scarcely anyone pretends that harm has ever been effected. It was a striking thing to behold my guides in the mountain before laying themselves down to sleep, fall on their knees & utter with apparent sincerity a prayer in their native tongue. In every respect we were delighted with Tahiti, & add ourselves as one more to the list of admirers of the Queen of the Islands.

Again we consumed three long weeks in crossing the sea to New Zealand, where we now shall stay about 10 days. I am disappointed in New Zealand, both in the country & in its inhabitants. After the Tahitians the natives appear savages. The Missionaries have done much in improving their moral character, & still more in teaching them the arts of civilization. It is something to boast of that Europeaens may here amongst men who so lately were the most ferocious savages probably on the face of the earth, walk with as much safety as in England. We are quite indignant with Earle's book; beside extreme injustice it shows ingratitude. Those very Missionaries who are accused of coldness I know without doubt always treated him with far more civility than his open licentiousness could have given reason to expect. I walked to a country Mission 15 miles distant, & spent as merry & pleasant an evening with these *austere* men as ever I did in my life time.

I have written thus much about the Missionaries as I thought it would be a subject which would interest you.

I am looking forward with more pleasure to seeing Sydney than to any other



part of the voyage; our stay there will be very short – only a fortnight; I hope however to be able to take a ride some way into the country. From Sydney we proceed to King George's Sound, & so on as formerly planned. Be sure not to forget to have a letter at Plymouth on or rather before the 1st of August.

Daylight is failing me, so I will wish you good bye; how strange it is to think that perhaps at this very second Nancy is making a vain effort to rouse you all from your slumbers on a cold frosty morning. How glad I shall be when I can say like the good old Quarter Master who, entering the Channel on a gloomy November morning, exclaimed 'Ah here there are none of those d——d blue skies.' I forgot to mention that by a string of extraordinary chances the day before finally leaving the Galapagos, I received your letter of March. I am almost afraid that at Sydney we shall be too soon for our instructions respecting letters. Give my most affectionate love to my Father, Erasmus, Marianne & all of you. Good bye my dear Caroline,

Yours,  
C. Darwin.

I have written to Charlotte. I also enclose a letter for Fanny, will you forward it? I do not myself know the present direction. I have also written to Sarah.

*Darwin and Beagle* pp. 128–31

The *Beagle* left the Bay of Islands on December 30th, and set sail for Sydney, where she arrived on January 12th. Darwin took a hundred mile ride to Bathurst.

Near midnight, on the 11th [January], we saw the red, revolving light of Sydney Light-house, and next day entered Port Jackson, and anchored in Sydney Cove. Much as I had heard of the progress and importance of this place, my astonishment was indeed great, when I saw a well-built city covering the country near the port. Not many days previously I had been reading the account of Governor Phillip's voyage to Botany Bay in 1787–8, and little did I think that, in forty-eight years from the first discovery of Port Jackson, a city, upon a large scale, could have arisen out of a wilderness so near our antipodes. In the account just mentioned it is stated that 'from a piece of clay imported from Sydney Cove, Mr Wedgwood caused a medallion to be modelled, representing Hope, encouraging Art and Labour, under the influence of Peace, to pursue the means of giving security and happiness to the infant settlement. The following lines, in allusion to this medallion, were written by Dr Darwin.'

Where Sydney Cove her lucid bosom swells,  
Courts her young navies and the storm repels,  
High on a rock, amid the troubled air,  
Hope stood sublime, and wav'd her golden hair;  
Calm'd with her rosy smile the tossing deep,  
And with sweet accents charm'd the winds to sleep;  
To each wild plain, she stretch'd her snowy hand,  
High-waving wood, and sea-encircled strand.  
'Hear me,' she cried, 'ye rising realms! record  
Time's opening scenes, and Truth's unerring word.



There shall broad streets their stately walls extend,  
 The circus widen, and the crescent bend;  
 There ray'd from cities o'er the cultur'd land,  
 Shall bright canals, and solid roads expand.  
 There the proud arch, Colossus-like, bestride  
 Yon glittering streams, and bound the chasing tide;  
 Embellish'd villas crown the landscape scene,  
 Farms wave with gold, and orchards blush between.  
 There shall tall spires, and dome-capt towers ascend,  
 And piers and quays their massy structures blend;  
 While with each breeze approaching vessels glide,  
 And northern treasures dance on every tide!  
 Here ceased the nymph – tumultuous echoes roar,  
 And Joy's loud voice was heard from shore to shore –  
 Her graceful steps descending press'd the plain;  
 And peace, and Art, and Labour, join'd her train.

When I was at Sydney in 1836, all that was foretold in this allegory had come to pass, with one exception only, that of canals. It was always a country comparatively dry; and unfortunately the more wood is cleared away, the drier both climate and soil become, therefore it is unlikely that canals should ever be made there. This want of fresh water is the only drawback to the future prosperity of this mushroom city; which is now dependent upon a supply brought through iron pipes from a distance of several leagues. Mr Busby, father of the resident at New Zealand, was the projector and executor of this aqueduct, but, like many other really valuable things, his useful work as ably planned as it was perseveringly carried on against uncommon difficulties, is but little appreciated, even by those who daily drink the pure water which it supplies.

It is difficult to believe that Sydney will continue to flourish in proportion to its rise. It has sprung into existence too suddenly. Convicts have forced its growth, even as a hotbed forces plants, and premature decay may be expected from such early maturity. Other rising colonies have advantages in point of situation and climate, which the country about Sydney does not possess; and if our government establishment should be withdrawn, from that day the decline of the city would commence, because its natural advantages are not sufficient to enable it to compete with other places in those regions, excepting while fostered by the presence of regularly paid government officers, troops, and a large convict establishment.

There must be great difficulty in bringing up a family well in that country, in consequence of the demoralizing influence of convict servants, to which almost all children must be more or less exposed. Besides, literature is at a low ebb: most people are anxious about active farming, or commercial pursuits, which leave little leisure for reflection, or for reading more than those fritterers of the mind – daily newspapers and ephemeral trash. It was quite remarkable to see how few booksellers' shops there were in Sydney, and what a low class of books – with some exceptions – was to be found in them. These few exceptions were the works usually called 'standard,' which some persons who buy books, for show as



furniture, rather than for real use, think it necessary to purchase. Another evil in the social system of Sydney and its vicinity, is the rancorous feeling which exists between the descendants of free settlers and the children of convicts. Fatal, indeed, would it be to the former, if the arm of power were removed; for their high principles and good feelings would be no match for the wiles and atrocities of such abandoned outcasts as are there congregated, and almost rejoice in their iniquity. Money is gained by such people by any and every means, save those of honest industry. By selling spirits, frequently drugged – by theft – by receiving and selling stolen goods – by the wages of iniquity – and by exorbitant usury – fortunes have been amassed there in a few years which would make an honest man's hair stand on end. But do such men enjoy their wealth? Does it benefit them or their children? No. Their life is a miserable scene of anxiety, care, fear, and general penuriousness; they die without a friend and without hope.

*Narrative* 2 pp.621–3

JAN. 18th. Very early in the morning I walked about three miles to see Govett's Leap; a view of a similar, but even perhaps more stupendous character than that of the Weatherboard. So early in the day the gulf was filled with a thin blue haze, which, although destroying the general effect, added to the apparent depth of the forest below, from the country on which we stood. Mr Martens, who was formerly in the Beagle & now resides in Sydney, has made striking & beautiful pictures from these two views.

A short time after leaving the Blackheath, we descended from the sandstone platform by the pass of Mount Victoria. To affect this pass, an enormous quantity of stone has been cut through; the design & its manner of execution would have been worthy of a line of road in England, even that of Holyhead. We now entered upon a country less elevated by nearly a thousand feet & consisting of granite: with the change of rock the vegetation improved; the trees were both finer & stood further apart, & the pasture between them was a little greener & more plentiful. At Hassan's walls I left the high road & made a short detour to a farm called Walerawang, to the superintendent of which I had a letter of introduction from the owner in Sydney. Mr Browne had the kindness to ask me to stay the ensuing day, which I had much pleasure in doing. This place offers an example of one of the large farming or rather sheep grazing establishments of the Colony; cattle & horses are, however, in this case rather more numerous than usual, owing to some of the valleys being swampy & producing a coarser pasture. The sheep were 15,000 in number of which the greater part were feeding under the care of different shepherds on unoccupied ground, at the distance of more than a hundred miles beyond the limits of the Colony. Mr Browne had just finished this day, the last of the shearing of seven thousand sheep; the rest being sheared in another place. I believe the value of the average produce of wool from 15,000 sheep would be more than 5000£ sterling. Two or three flat pieces of ground near the house were cleared & cultivated with corn, which the harvest men were now reaping. No more wheat is sown than sufficient for the annual support of the labourers; the general number of assigned convict servants being here about forty; but at





*View of Sydney from North Shore*

present there were rather more. Although the farm is well stocked with every requisite, there was an apparent absence of comfort; & not even one woman resided here. The Sunset of a fine day will generally cast an air of happy contentment on any scene; but here at this retired farmhouse the brightest tints on the surrounding woods could not make me forget that forty hardened profligate men were ceasing from their daily labours, like the Slaves from Africa, yet without their just claim for compassion.

Early on the next morning Mr Archer, the joint superintendent, had the kindness to take me out Kangaroo hunting. We continued riding the greater part of the day; but had very bad sport, not seeing a Kangaroo or even a wild dog. The Grey-hounds pursued a Kangaroo Rat into a hollow tree out of which we dragged it: it is an animal as big as a rabbit, but with the figure of a Kangaroo. A few years since this country abounded with wild animals; now the Emu is banished to a long distance & the Kangaroo is become scarce; to both, the English Greyhound is utterly destructive; it may be long before these animals are altogether exterminated, but their doom is fixed. The Natives are always anxious to borrow the dogs from the farmhouses; their use, offal when an animal is killed, & milk from the cows, are the peace offerings of the Settlers, who push further & further inland. The thoughtless Aboriginal, blinded by these trifling advantages, is delighted at the approach of the White Man, who seems predestined to inherit



the country of his children. Although having bad sport, we enjoyed a pleasant ride. (19th.) The woodland is generally so open that a person on horseback can gallop through it; it is traversed by a few flat bottomed valleys, which are green & free from trees; in such spots the scenery was like that of a park & pretty. In the whole country I scarcely saw a place without the marks of fire; whether these had been more or less recent, whether the stumps were more or less black, was the greatest change which varied the monotony so wearisome to the traveller's eye. In these woods there are not many birds; I saw, however, some large flocks of the white Cockatoo feeding in a Corn field; & a few most beautiful parrots; crows, like our jackdaws, were not uncommon & another bird something like the magpie. The English have not been very particular in giving names to the productions of Australia; trees of one family (*Casuarina*) are called Oaks, for no one reason that I can discover without it is that there is no one point of resemblance; animals are called tigers & hyenas, simply because they are Carnivorous, & so on in many other cases. In the dusk of the evening I took a stroll along a chain of ponds, which in this dry country represent the course of a river, & had the good fortune to see several of the famous Platypus or *Ornithorhyncus paradoxicus*. They were diving & playing about the surface of the water; but showed very little of their bodies, so that they might easily have been mistaken for many water rats. Mr Browne shot one; certainly it is a most extraordinary animal; the stuffed specimens do not give at all a good idea of the recent appearance of the head & beak; the latter becoming hard & contracted.

A little time before this I had been lying on a sunny bank & was reflecting on the strange character of the animals of this country as compared to the rest of the World. An unbeliever in everything beyond his own reason might exclaim, 'Surely two distinct Creators must have been at work; their object, however, has been the same & certainly the end in each case is complete.' Whilst thus thinking, I observed the conical pitfall of a Lion-Ant: a fly fell in & immediately disappeared; then came a large but unwary Ant. His struggles to escape being very violent, the little jets of sand described by Kirby (Vol. 1. p. 425) were promptly directed against him. His fate, however, was better than that of the fly's. Without doubt the predaecious Larva belongs to the same genus but to a different species from the Europæan kind. Now what would the *Disbeliever* say to this? Would any two workmen ever hit on so beautiful, so simple, & yet so artificial a contrivance? It cannot be thought so. The one hand has surely worked throughout the universe. A Geologist perhaps would suggest that the periods of Creation have been distinct & remote the one from the other; that the Creator rested in his labor.

*Diary* pp. 380-3

C.D. TO MISS SUSAN DARWIN

Sydney January 28th 1836

My dear Susan

The day after tomorrow we shall sail from this place, but before I give any account of our proceedings, I will make an end with Business. Will you tell my



Father that I have drawn a bill for 100£, of which fifty went to pay this present & last year's mess money. The remaining fifty is for current expences, or rather I grieve to say it was for such expences: for all is nearly gone. This is a most villainously dear place, & I stand in need of many articles.

You will have received my letter some time ago from New Zealand. Here we arrived on the 12th of this month. On entering the harbor we were astounded with all the appearances of the outskirts of a great city: numerous Windmills – Forts – large stone white houses, superb Villas &c, &c. On coming to an Anchor I was full of eager expectation, but a damp was soon thrown over the whole scene by the news there was not a single letter for the *Beagle*. None of you at home can imagine what a grief this is. There is no help for it: We did not formerly expect to have arrived here so soon, & so farewell letters. The same fate will follow us to the C. of Good Hope; & probably when we reach England I shall not have received a letter dated within the last 18 months. And now that I have told my pitiable story, I feel much inclined to sit down & have a good cry.

Two days after arriving here I started on a ride to Bathurst, a place about 130 [miles] in the interior, & the waters of which flow in to the vast unknown interior. My object was partly for Geology, but chiefly to get an idea of the state of the colony, & see the country. Large towns all over the world are nearly similar, & it is only by such excursions that the characteristic features can be perceived. This is really a wonderful Colony; ancient Rome, in her Imperial grandeur, would not have been ashamed of such an offspring. When my Grandfather wrote the lines of 'Hope's visit to Sydney Cove' on Mr Wedgwood's medallion he prophecyed most truly. Can a better proof of the extraordinary prosperity of this country be conceived, than the fact that 7/8th of an acre of land in the town sold by auction for 12,000£ Sterling? There are men now living, who came out as convicts (& one of whom has since been flogged at the Cart's tail round the town), who are said to possess without doubt an income from 12 to 15,000 pounds per annum. Yet with all this, I do not think this Colony ever can be like N. America: it never can be but an agricultural country. The climate is so dry, & the soil light, that the aspect even of the better parts is very miserable. The scenery is singular from its uniformity – everywhere open forest land; the trees [all have] the same character of growth & their foliage is of one tint. It is an admirable country to grow rich in: turn Sheep-herd & I believe with common care, you must grow wealthy. Formerly I had entertained Utopian ideas concerning it; but the state of society of the lower classes, from their convict origin, is so disgusting, that this & the sterile monotonous character of the scenery have driven Utopia & Australia into opposite sides of the World.

In my return from my ride I staid a night with Capt King, who lives about 30 miles from Sydney. With him, I called on some of his relations, a family of MacArthurs, who live in a beautiful very large country house.<sup>1</sup> When we called I suppose there were twenty people sitting down to luncheon; There was such a bevy of pretty ladylike Australian girls, & so deliciously English-like the whole party looked, that one might have fancied oneself actually in England.

<sup>1</sup>Camden Park, RDK



From Sydney we go to Hobart Town, from there to King George Sound, & then adieu to Australia. From Hobart town being superadded to the list of places I think we shall not reach England before September: But thank God the Captain is as home sick as I am, & I trust he will rather grow worse than better. He is busy in getting his account of the voyage in a forward state for publication. From those parts which I have seen of it, I think it will be well written, but to my taste is rather defecient in energy or vividness of description. I have been for the last 12 months on very cordial terms with him. He is an extraordinary but noble character, unfortunately however affected with strong peculiarities of temper. Of this, no man is more aware than himself, as he shows by his attempts to conquer them. I often doubt what will be his end. Under many circumstances I am sure it would be a brilliant one, under others I fear a very unhappy one.

From K. George Sound to Isle of France, C. of Good Hope, St Helena, Ascension, & omitting the C. Verds on account of the unhealthy season, to the Azores & then England. To this last stage I hourly look forward with more & more intense delight; I try to drive into my stupid head Maxims of patience & common sense, but that head is too full of affection for all of you to allow such dull personages to enter. My best love to my Father. God Bless you all – My dearest old Granny.

Your most affectionate brother  
Charles Darwin

Tell my Father I really am afraid I shall be obliged to draw a small bill at Hobart. I know my Father will say that a hint from me on such [a] subject is as worthy of as much attention as if it was foretold by a sacred revelation. But I do not feel in truth oracular on the subject. I have been extravagant & bought two water-color sketches, one of the S. Cruz river & another in T. del Fuego, 3 guineas each, from Martens, who is established as an Artist at this place. I would not have bought them if I could have guessed how expensive my ride to Bathurst turned out.

*Darwin and Beagle* pp.131–4

C.D. TO PROFESSOR HENSLOW

Sydney–January–1836

My dear Henslow

This is the last opportunity of communicating with you before that joyful day when I shall reach Cambridge. I have very little to say: But I must write if it was only to express my joy that the last year is concluded & that the present one in which the Beagle will return, is gliding onwards. We have all been disappointed here in *not* finding even a *single* letter; we are indeed rather before our expected time, otherwise I daresay I should have seen your handwriting. I must feed upon the future & it is beyond bounds delightful to feel the certainty that within eight months I shall be residing once again most quietly in Cambridge. Certainly I never was intended for a traveller; my thoughts are always rambling over past or future scenes; I cannot enjoy the present happiness, for anticipating the future; which is about as foolish as the dog who dropt the real bone for it's shadow.

You see, we are now arrived at Australia: the new Continent really is a



wonderful place. Ancient Rome might have boasted of such a Colony; it deserves to rank high amongst the 100 wonders of the world, as showing the Giant force of the parent country. I travelled to Bathurst, a place, 130 miles in the interior, & thus saw a little of the country. The system of communication is carried on in an admirable style; the roads are excellent, & on the Macadam principle; to form them vast masses of rock have been cut away. The following facts, I think, very forcibly show how rapid & extraordinary is the increase of wealth – a fraction (I believe  $\frac{7}{8}$ th) of an acre of land in Sydney, fetched by Auction twelve thousand pounds; the increase of public revenue during the last year has been 68,000£. It is well known, that there are men, who came out convicts, who now possess an yearly income of 15,000£. Is not this all wonderful? But yet I do not think this country can ever rise to be a second North America. The sterile aspect of the land, at once proclaims that Agriculture will never succeed. Wool, Wool – is repeated & must ever be the cry from one end of the country to the other. The scenery, from the extraordinary uniformity of its character, is very peculiar. Every where, trees of the same class & appearance are thinly scattered, with their upright trunks, over arid downs. The greatest change is that in some places the fire has been more recent & the stumps are black whilst in others, their natural color is nearly regained. On the whole I do not like New South Wales: it is without doubt an admirable place to accumulate pounds & shillings; but Heaven forbend that ever I should live, where every other man is sure to be somewhere between a petty rogue & bloodthirsty villain.

In a short time we sail for Hobart town, then to K: Georges Sound, Isle of France, C. of Good Hope &c, &c England. I last wrote to you from Liina, since which time I have done disgracefully little in Nat: History; or rather I should say since the Galapagos Islands, where I worked hard. Amongst other things, I collected every plant, which I could see in flower, & as it was the flowering season I hope my collection may be of some interest to you. I shall be very curious to know whether the Flora belongs to America, or is peculiar. I paid also much attention to the Birds, which I suspect are very curious. The Geology to me personally was very instructive & amusing; Craters of all sizes & forms, were studded about in every direction; some were such tiny ones, that they might be called quite Specimen Craters. There were however a few facts of interest, with respect to layers of Mud or Volcanic Sandstone, which must have flowed like streams of Lava. Likewise respecting some grand fields of Trachytic Lava. The Trachyte contained large Crystals of glassy, fractured Feldspar & the streams were naked, bare & the surface rough, as if they had flowed a week before. I was glad to examine a kind of Lava, which I believe in recent days has not in Europe been erupted.

In our passage across the Pacifick, we only touched at Tahiti & New Zealand: at neither of these places, or at sea had I much opportunity of working. Tahiti is a most charming spot. Everything, which former Navigators have written is true: 'A new Cytheraea has risen from the ocean.' Delicious scenery, climate, manners of the people, are all in harmony. It is moreover admirable to behold what the Missionaries both here & at New Zealand have effected. I firmly believe they are



good men working for the sake of a good cause. I much suspect that those who have abused or sneered at the Missionaries, have generally been such as were not very anxious to find the Natives moral & intelligent beings. During the remainder of our voyage, we shall only visit places generally acknowledged as civilized & nearly all under the British Flag. There will be a poor field for Nat: History & without it, I have lately discovered that the pleasure of seeing new places is as nothing. I must return to my old resource & think of the future, but that I may not become more prosy I will say Farewell, till the day arrives, when I shall see my Master in Natural History & can tell him, how grateful I feel for his kindness & friendship. Believe me Dear Henslow

Ever yours Most Faithfully  
Chas Darwin

*Darwin & Henslow* pp. 112-14

C.D. TO MISS CATHERINE DARWIN

Hobart Town, Van Diemen's Land. February 14th 1836

My dear Catherine,

I am determined to begin a letter to you, although I am sadly puzzled, as you may see by the length of the date, to know what to write about. I presume you will have received, some few days before this, my letter from Sydney. We arrived here after a six days passage, & have now been here 10. Tomorrow morning we sail for King George Sound - 1800 miles of most Stormy Sea. Heaven protect & fortify my poor stomach.

All on board like this place better than Sydney; the uncultivated parts here have the same aspect as there, but from the climate being damper, the Gardens, full of luxuriant vegetables, & fine corn fields, delightfully resemble England. To a person not particularly attached to any particular kind (such as literary, scientific &c) of society, & bringing out his family, it is a most admirable place of emigration. With care & a very small capital, he is sure soon to gain a competence, & may, if he likes, die Wealthy. No doubt in New S. Wales a man will sooner be possessed of an income of thousands per annum. But I do not think he would be a gainer in comfort. There is a better class of Society. Here there are no Convicts driving in their carriages & revelling in Wealth. Really the system of emigration is excellent for poor Gentlemen. You would be astonished to know what pleasant society there is here. I dined yesterday at the Attorney's General, where amongst a small party of his most intimate friends he got up an excellent concert of first rate Italian Music. The house large, beautifully furnished, dinner most elegant, with *respectable!* (although of course all Convicts) Servants. A short time before, they gave a fancy Ball, at which 113 people were present. At another very pleasant home, where I dined, they told me at their last dancing party 96 was the number. Is not this astonishing in so remote a part of the world?

It is necessary to leave England, & see distant Colonies of various nations, to know what wonderful people the English are. It is rather an interesting feature in our Voyage, seeing so many of the distant English Colonies: Falklands Island (the lowest in the scale), 3 parts of Australia, Isd of France, the Cape, St Helena, &



Ascension. My reason tells me I ought to enjoy all this; but I confess I never see a Merchant Vessel start for England without a most dangerous inclination to bolt. It is a most true & grievous fact that the last four months appear to me as long as the previous years, at which rate I have yet to remain out four years longer. There never was a Ship so full of home-sick heroes as the *Beagle*. We ought all to be ashamed of ourselves. What is five years, compared to the Soldiers & Civilians', whom I most heartily pity, life in India? If a person is obliged to leave friends & country, he had much better come out to these countries & turn farmer. He will not then return home on half pay, & with a pallid face. Several of our Officers are seriously considering the all important subject, which sounds from one end of the Colony to the other, of Wool.

My Father will be glad to hear that my prophetic warning in my last letter has turned out false. Not making any expedition, I have not required any money. Give my love to my dear Father. I often think of his kindness to me in allowing me to come [on] this voyage – indeed in what parts of my life can I think otherwise.

Good bye my dear Katty. I have nothing worth writing about, as you may see. Thank Heaven, it is an unquestioned fact that months weeks & days will pass away, although they may travel like most arrant Sluggards. If we all live, we shall meet in Autumn.

Your affectionate Brother,  
Charles Darwin.

*Darwin and Beagle* pp. 135–6

The *Beagle* left Sydney on January 30th, and arrived at her next port of call, Hobart, on February 5th. After twelve days there she sailed again, working her way southward round Tasmania, and then north-westward against contrary winds to King George Sound, a harbour in the south-west corner of Australia, where she anchored on March 6th. A week later she set a course into the Indian Ocean for the Cocos Keeling Islands, which were reached on April 1st. While in accordance with Admiralty instructions, the ship's boats were measuring the tides and taking soundings, Darwin seized the opportunity of investigating the structure of a coral island.

The circularly-formed Coral Islands in the Pacific occasionally afford excellent land-locked harbours, with a sufficient entrance, and would be well adapted to any nice astronomical observations which might require to be carried on in undisturbed tranquillity. While these are quietly proceeding, and the chronometers rating, a very interesting inquiry might be instituted respecting the formation of these coral reefs.

An exact geological map of the whole island should be constructed, showing its form, the greatest height to which the solid coral has risen, as well as that to which the fragments appear to have been forced. The slope of its sides should be carefully measured in different places, and particularly on the external face, by a series of soundings, at very short distances from each other, and carried out to the



greatest possible depths, at times when no tide or current can affect the perpendicularity of the line. A modern and very plausible theory has been put forward, that these wonderful formations, instead of ascending from the bottom of the sea, have been raised from the summits of extinct volcanoes; and therefore the nature of the bottom of each of these soundings should be noted, and every means exerted that ingenuity can devise of discovering at what depth the coral formation begins, and of what materials the substratum on which it rests is composed. The shape, slope, and elevation of the coral knolls in the lagoon would also help the investigation; and no circumstances should be neglected which can render an account of the general structure clear and perspicuous.

A set of observations connected with the theory of the tides might likewise be carried on with peculiar propriety in one of these coral basins, provided the openings should be sufficiently wide and deep to admit the flux and reflux without material impediment. The island selected for such a purpose should be nearly midway in the ocean, and not very far from the equator. There the tidal wave, uninfluenced by the interrupting barrier of one continent, and equally far from the reaction of the other, might be measured with very beneficial results. Delicate tide-gauges should be prepared beforehand, and immediately fixed in some snug nook, where the undulation of the sea could not reach. The rise and fall of the tide should be registered every hour, during the stay of the *Beagle*, as well as the moments (stated whether in apparent or mean time) of high and low water, as nearly as they can be obtained; and the periods at which the sea and land breezes spring up and fail should likewise be noted, with their effects on the tide, if they can be detected. A boat should be detached, on each tide, to some distance from the island, in order to ascertain the strength and direction of the stream; and all these operations should be continued, if possible, through a whole lunation.

[from the Hydrographer's Instructions to the *Beagle*, issued 11 November 1831.  
*Narrative* 2, pp.38-9]

Many reasons had induced me to select this group of coral islets for such an examination as our time and means would admit of; and, as the tides were to be an object of especial attention in a spot so favourably situated for observing them, a tide-guage was immediately placed. Its construction was then new, and, being found to answer, I will describe it briefly. Two poles were fixed upright, one on shore (above high water mark, and sheltered from wind), the other in the sea beyond the surf at low water. A block was fastened on the top of each pole, and a piece of well-stretched log-line 'rove' through them. One end of the line was attached to a board that floated on the water; the other suspended a leaden weight, which traversed up and down the pole, on shore, as the float fell or rose with the tide. Simple as this contrivance was, and useful as we should have found it in many places where the surf or swell made it difficult to measure tides at night, without using a boat, I never thought of it till after we left King George Sound.

*Narrative* 2 p.629



APRIL 1st. We arrived in view of the Southern Keeling or Cocos Isd. Our passage would have been a very good one, if during the last five days when close to our journey's end, the weather had not become thick & tempestuous. Much rain fell, & the heat & damp together were very oppressive: in the Poop cabin the thermometer however, only stood at  $81^{\circ}$  or  $82^{\circ}$ . Keeling Isd is one of the low circular Coral reefs, on the greater part of which matter has accumulated & formed strips of dry land. Within the chain of Isds there is an extensive shallow lake or lagoon. The reef is broken on the Northern side & there lies the entrance to the anchorage. The general appearance of the land at a distance is precisely similar to what I have mentioned at the Low Isds of the Pacifick. On entering the Lagoon the scene is very curious & rather pretty, its beauty is, however, solely derived from the brilliancy of the surrounding colors. The shoal, clear & still water of the lagoon, resting in its greater part on white sand, is, when illuminated by a vertical sun, of a most vivid green. This brilliant expanse, which is several miles wide, is on all sides divided either from the dark heaving water of the ocean by a line of breakers, or from the blue vault of Heaven by the strip of land, crowned at an equal height by the tops of the Cocoa nut trees. As in the sky here & there a white cloud affords a pleasing contrast, so in the lagoon dark bands of living Coral are seen through the emerald green water. Looking at any one & especially at a smaller Islet, it is impossible not to admire the elegant manner in which the young & full grown Cocoa-nut trees, without destroying each others symmetry, mingle together into one wood: the beach of glittering white Calcareous sand, forms the border to these fairy spots.

When the ship was in the channel at the entrance, Mr Liesk, an English resident, came off in his boat. The history of the inhabitants of this place, is, in as few words as possible, as follows: About nine years ago a Mr Hare, a very worthless character, brought from the E. Indian Archipelago a number of Malay slaves which now, including children, amount to more than a hundred. Shortly afterwards Capt. Ross who had before visited these Isds in his merchant ship, arrived from England bringing with him his family & goods for Settlement: along with him came Mr Liesk, who had been a Mate in the same ship. The Malay slaves soon ran away from the Isd on which Mr Hare was settled & joined Capt. Ross's party; Mr Hare upon this was ultimately obliged to leave these Islands. The Malays are now nominally in a state of freedom, & certainly so, as far as respects their personal treatment; but in most other points they are considered as slaves. From the discontented state of the people, the repeated removals & perhaps from a little mismanagement, things are not very prosperous. The island has no quadruped excepting pigs, & no vegetables in any quantity excepting Cocoa nuts. On this tree depends the prosperity of the Isd. The only export is Cocoa nut oil. At this present time Capt. Ross has taken in a small schooner which was built here, a cargo of this oil & of the nuts to Singapore. He will bring back rice & goods for the Malays. On the Cocoa nuts, the Pigs, which are loaded with fat, almost entirely subsist, as likewise do the poultry & ducks. Even a huge land-crab is furnished by nature with a curious instinct & form of legs to open & feed on the same fruit. There is no want of animal food at these Islands, for turtle &



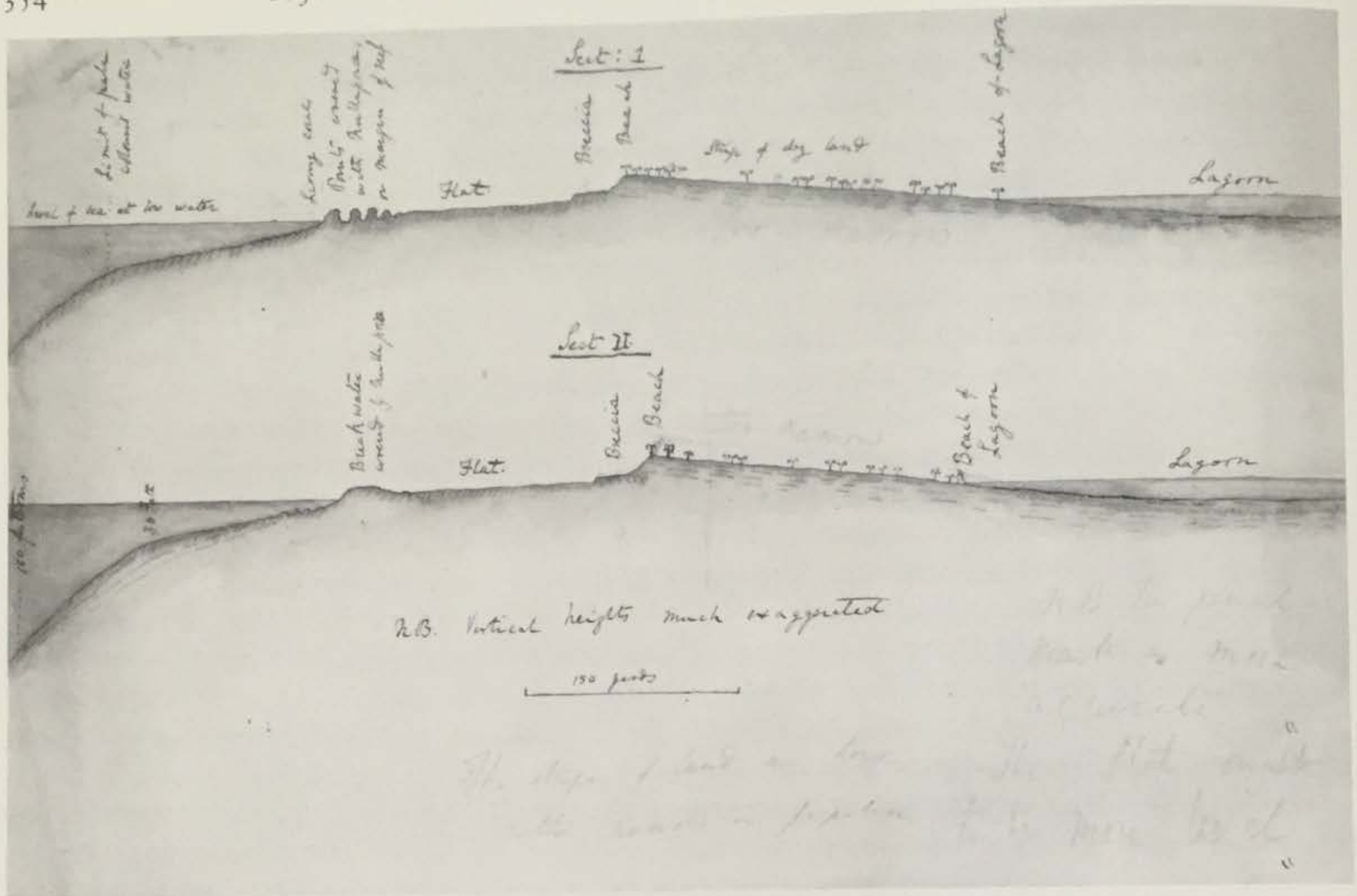
fish abound in the lagoon. The situation of this Isd & its facilities for shipping must one day make it of some consequence, & then its natural advantages will be more fully developed. The ship came to an anchor in the evening, but on the following morning was warped nearer to Direction or Rat Isd.

2nd. I went on shore. The strip of dry land is only a few hundred yards wide; on the lagoon side we have the white beach, the radiation from which in such a climate is very oppressive; & on the outer coast a solid broad flat of coral rock, which serves to break the violence of the open ocean. Excepting near the lagoon where there is some sand, the land is entirely composed of rounded fragments of coral. In such a loose, dry, stony soil, nothing but the climate of the intertropical regions could produce a vigorous vegetation. Besides the Cocoa nut which is so numerous as at first to appear the only tree, there are five or six other kinds. One called the Cabbage tree, grows to a great bulk in proportion to its height, & has an irregular figure; its wood being very soft. Besides these trees the number of native plants is exceedingly limited; I suppose it does not exceed a dozen. Yet the woods, from the dead branches of the trees, & the arms of the Cocoa nuts, is as thick as a jungle. There are no true land birds; a snipe & land-rail are the only two 'waders', the rest are all birds of the sea. Insects are very few in number; I must except some spiders & a small ant, which swarms in countless numbers in every spot & place. These strips of land are raised only to the height to which during gales of wind, the surf can throw loose fragments; their protection is due to the outward & lateral increase of the reef which must break off the sea. The aspect & constitution of these Islets at once calls up the idea that the land & the ocean are here struggling for the mastery: although terra firma has obtained a footing, the denizens of the other element think their claim at least equal. In every part one meets Hermit-Crabs of more than one species. The large claw or pincers of some of them are most beautifully adapted when drawn back, to form an operculum to the shell, which is nearly as perfect as the proper one which the living molluscous animal formerly possessed. I was assured, & as far as my observation went it was confirmed, that there are certain kinds of these hermits which always use certain kinds of old shells, carrying on their backs the houses they have stolen from the neighbouring beach. Overhead, the trees are occupied by numbers of gannets, frigate birds & terns; from the many nests & smell of the air, this might be called a sea rookery; but how great the contrast with a rookery in the fresh budding woods of England! The gannets, sitting on their rude nests, look at an intruder with a stupid yet angry air. The noddies, as their names expresses, are silly little creatures. But there is one charming bird, it is a small & snow white tern, which smoothly hovers at the distance of an arm's length from one's head, its large black eye scanning with quiet curiosity your expression. Little imagination is required to fancy that so light & delicate a body must be tenanted by some wandering fairy spirit.

*Diary pp.394-7*

APRIL 12th. In the morning we stood out of the Lagoon. I am glad we have visited these Islands; such formations surely rank high amongst the wonderful





*Formation of a coral island*

objects of this world. It is not a wonder which at first strikes the eye of the body, but rather after reflection, the eye of reason. We feel surprised when travellers relate accounts of the vast piles & extent of some ancient ruins; but how insignificant are the greatest of these, when compared to the matter here accumulated by various small animals. Throughout the whole group of Islands, every single atom, even from the most minute particle to large fragments of rocks, bear the stamp of once having been subjected to the power of organic arrangement. Capt. FitzRoy at the distance of but little more than a mile from the shore sounded with a line 7200 feet long, & found no bottom. Hence we must consider this Isd as the summit of a lofty mountain; to how great a depth or thickness the work of the Coral animal extends is quite uncertain. If the opinion that the rock-making Polypi continue to build upwards as the foundation of the Isd from volcanic agency, after intervals, gradually subsides, is granted to be true; then probably the Coral limestone must be of great thickness. We see certain Isds in the Pacific, such as Tahiti & Eimeo, mentioned in this journal, which are encircled by a Coral reef separated from the shore by channels & basins of still water. Various causes tend to check the growth of the most efficient kinds of Corals in these situations. Hence if we imagine such an Island, after long successive intervals to subside a few feet, in a manner similar, but with a movement opposite to the continent of S. America; the coral would be continued



upwards, rising from the foundation of the encircling reef. In time the central land would sink beneath the level of the sea & disappear, but the coral would have completed its circular wall. Should we not then have a Lagoon Island? – Under this view, we must look at a Lagoon Isd as a monument raised by myriads of tiny architects, to mark the spot where a former land lies buried in the depths of the ocean.

The *Beagle* stood over to the Northern Isd distant about 12 miles. This likewise is a small Lagoon Isd, but its centre is nearly filled up: the entrance is not deep enough even for a boat to enter. The plan being completed, in the evening a course was taken for the Isle of France.

*Diary* pp. 399–400

On April 12th the *Beagle* set sail once more to the west. After calling at Mauritius (the Isle of France) from April 29th to May 9th, she anchored in Simons Bay, just inside the Cape of Good Hope, on May 31st. An increasingly home-sick Darwin left a letter for his sisters at each port of call.

C.D. TO MISS CAROLINE DARWIN

Port Lewis, Mauritius, April 29th 1836

My dear Caroline,

We arrived here this morning; as a ship sails for England tomorrow I will not let escape the opportunity of writing. But as I am both tired & stupid, my letter will be equally dull. I wrote from Sydney & Hobart town; after leaving the latter place, we proceeded to King Georges Sound. I did not feel much affection for any part of Australia, & certainly nothing could be better adapted than our last visit to put the finishing stroke to such feelings.

We then proceeded to the Keeling Isds. These are low lagoon Isds about 500 miles from the coast of Sumatra. I am very glad we called there, as it has been our only opportunity of seeing one of these wonderful productions of the Coral polypi. The subject of coral formation has for the last half year been a point of particular interest to me. I hope to be able to put some of the facts in a more simple & connected point of view, than that in which they have hitherto been considered. The idea of a lagoon Island, 30 miles in diameter, being based on a submarine crater of equal dimensions, has always appeared to me a monstrous hypothesis.

From the Keeling Isds we came direct to this place. All which we have yet seen is very pleasing. The scenery cannot boast of the charms of Tahiti & still less of the grand luxuriance of Brazil; but yet it is a complete & very beautiful picture. But there is no country which has now any attractions for us, without it is seen right astern, & the more distant & indistinct the better. We are all utterly home sick; I feel sure there is a wide difference between leaving one's home to reside for five years in some foreign country & in wandering for the same time. There is nothing, which I so much long for, as to see any spot & any object, which I have seen before, & can say I will see again. Our heads are giddy, with such a constant whirl. The Capt. continues to push along with a slack rein & an armed heel –



thank Heaven not an hour has lately been lost, or will again be lost. It is probable, if we escape the heavy gales off the Cape, we may reach England 8 weeks after you receive this letter. Our course beyond the Cape & St Helena is not certain; I think it will end in touching at Bahia, on the coast of Brazil. With what different sensations I shall now view the splendid scene from formerly. Then I thought an hour of such existence would have been cheaply purchased with a *year* of ordinary life, but now one glimpse of my dear home would be better than the united kingdoms of all the glorious Tropics.

Whilst we are at sea, & the weather is fine, my time passes smoothly because I am very busy. My occupation consists in rearranging old geological notes: the rearranging generally consists in totally rewriting them. I am just now beginning to discover the difficulty of expressing one's ideas on paper. As long as it consists only of description it is pretty easy, but where reasoning comes into play to make a proper connection, a clearness & a moderate fluency is to me, as I have said, a difficulty of which I had no idea. I am in high spirits about my geology, & even aspire to the hope that my observations will be considered of some utility by real geologists. I see very clearly, it will be necessary to live in London for a year, by which time with hard work the greater part, I trust, of my materials will be exhausted. Will you ask Erasmus to put down my name for the Whyndam or any other club; if, afterwards, it should be advisable not to enter it, there is no harm done. The Captain has a cousin in the Whyndam, whom he thinks will be able to get me in. Tell Erasmus to turn in his mind for some lodgings with good big rooms in some vulgar part of London. Now that I am planning about England, I really believe she is not at so hopeless a distance. Will you tell my Father I have drawn a bill for 30£.

The Captain is daily becoming a happier man, he now looks forward with cheerfulness to the work which is before him. He, like myself, is busy all day in writing, but instead of geology it is the account of the voyage. I sometimes fear his 'Book' will be rather diffuse, but in most other respects it certainly will be good: his style is very simple & excellent. He has proposed to me to join him in publishing the account, that is for him to have the disposal & arranging of my journal & to mingle it with his own. Of course I have said I am perfectly willing, if he wants materials, or thinks the chit-chat details of my journal are [in] any ways worth publishing. He has read over the part I have on board, & likes it. I shall be anxious to hear your opinions, for it is a most dangerous task, in these days, to publish accounts of parts of the world which have so frequently been visited. It is a rare piece of good fortune for me, that of the many errant (in ships) Naturalists, there have been few, or rather no, geologists. I shall enter the field unopposed. I assure you I look forward with no little anxiety to the time when Henslow, putting on a grave face, shall decide on the merits of my notes. If he shakes his head in a disapproving manner, I shall then know that I had better at once give up science, for science will have given up me. For I have worked with every grain of energy I possess.

But what a horridly egotistical letter I am writing; I am so tired that nothing short of the pleasant stimulus of vanity & writing about one's own dear self



would have sufficed. I have the excuse, if I write about my self, Heaven knows I think enough about all of you. We shall leave this Isld in 6 days time; if there is any opportunity I will write from the C. of Good Hope, & that letter possibly may be the last you will receive before you see me arrive, converted into an ancient brown-coloured Gentleman. The minute the Ship drops her anchor in the mud of old England, I will start for Shrewsbury. I trust we shall find letters at the Cape; but I have many fears; the date of the last letter I received was 13 months ago: This is a grievous period to be entirely ignorant about all one cares most for. It is probable we shall arrive early in September; you must recollect the possibility of my not having received letters for 18 months, so retell me any thing important; if I do not come by the 14th of September, write again to Plymouth post office. So that when I start for home, I may travel with a certain mind.

God bless you all. May you be well & happy. Forgive such a letter; I am sure you would sooner have it than nothing. So once again farewell to you all – give my most affectionate love to my Father & all. My dearest Caroline

your affectionate brother  
Chas Darwin

*Darwin and Beagle* pp. 136–9

C.D. TO MISS CATHERINE DARWIN

Cape of Good Hope June 3rd 1836

My dear Catherine

We arrived here the day before yesterday; the first part of our passage from Mauritius was very favourable, and the latter as execrably bad. We encountered a heavy gale of wind, which sharply reminded us of the old days near Cape Horn. It is a lucky thing for me that the voyage is drawing to its close, for I positively suffer more from sea sickness now, than three years ago.

All hands having been disappointed in letters at Sydney & Mauritius made up their minds for a grand pile at this place. The mountain of letters, alas, has dwindled into a small packet of about a dozen: amongst them I had the good fortune of receiving yours of Jan. 1836! Nine months' letters are wandering over the wide ocean, which we shall not receive till some time after reaching England; But if you knew the glowing unspeakable delight which I felt at being certain that my Father & all of you were well only four months ago, you would not grudge the labor lost in keeping up the regular series of letters – & it has only happened by such order that I have received this last letter. When I wrote from Mauritius, I begged that the Plymouth letter might contain a short abstract of the last 18 months; now it need only go back as far as January. Pray do not disappoint me [in] this, for otherwise I shall be uncomfortable in my journey instead of enjoying the sight of the most glorious & the most beautiful of countries.

I believe I have at home a leathern Portmanteau, great coat, & cloth leggings: if so, will you have them sent by the 1st of September directed to 'Lieut Sullivan, to the care of Mr Elliot, Royal Hotel, Devonport. (to be kept till H.M.S. Beagle arrives)'

We go from hence to St Helena, between which place & England, our stages



are not yet determined. The Beagle is now lying at Simons Bay, more than 20 miles from Cape Town, where I now am. This is a pretty & singular town; it lies at the foot of an enormous wall (the Table Mountain), which reaches to the clouds & makes a most imposing barrier. Cape Town is a great inn, on the great highway to the east; an extraordinary number of houses are occupied as boarding houses, in one of which I am now settled: the first day I got amongst a set of Nabobs who certainly, poor fellows, all together could not have produced a Liver as good as the hero in Beppo. They were heavy prozers. I was quite bewildered with Cawnpoor & so many 'poors', & with rushing from Calcutta to Bombay, backwards & forwards.

Tomorrow morning I am going to call with Capt. F.R. on the Sir J. Herschel. I have already seen the house which he has purchased; it is six miles from the town & in a most retired charming situation. I have heard so much about his eccentric but very aimiable manners that I have a high curiosity to see the great Man. The day after tomorrow, I hope to set out on a short ride of 3 or 4 days to get a few glimpses of African landscapes, or rather I should say, African deserts. Having seen so much of that sort of country in Patagonia, Chili & Peru, I feel myself to a certain degree a connoisseur in a desert, & am very anxious to see these. Every country has its peculiar character, & every country is well worth seeing. But oh the country of countries; the nice undulating green fields & shady lanes. Oh if you young ladies have been cutting down many of the trees (& I shall recollect every one) I never will forgive you.

I am quite delighted at hearing Erasmus is turned house holder; I hope I shall be able to get lodgings at no great distance, & then London will be a very pleasant place. I often however think Cambridge would be better, I can not make myself cockney enough to give up thoughts of a quiet walk on an Autumnal morning in the real country.

I have been a good deal horrified by a sentence in your letter where you talk of 'the little books with the extracts from your letters'. I can only suppose they refer to a few geological details. But I have always written to Henslow in the same careless manner as to you; & to print what has been written without care & accuracy is indeed playing with edge tools. But as the Spaniard says, 'No hay remedio'.


Farewell for the present & God bless you all. I have a strong suspicion that my Father will hear of me again before the time of sailing, which will happen in 10 days time. Give my love to the young Miss Parker; for I hope I have a little niece, instead of a fifth nephew. My dear Catherine,

Your affectionate Brother,  
C.D.

N.B. I find I am forced after all to draw a Bill of 30£ at once – it is not that I am at all sure I shall want the money here, but if on my return from the country my funds fail, I shall not at the moment well know what to do.



The *Beagle* left the Cape of Good Hope on June 18th, and made a slow passage in light and contrary winds to St Helena, which she reached on July 8th. Darwin spent four days on shore.

A.M.  at St Helena on Friday July 8th, 20 days being rather a good passage [at] this part of year (distant from Cape 1600 miles). St Helena from ship appears like a garrison on a large scale, viz. for wherever the eye is attracted it meets with a battery or muzzles of guns &c. The land, or Rock I should say, is very high, & most parts inaccessible (very dark rock without herbage). At this time, the beginning of winter, the Climate is very pleasant, but on Mountains rather cold. At this time of year, it rains very frequent[ly] in the course of the day (showers, a misty rain).

The 11th went to Napoleon's Grave, a distance of about  $2\frac{1}{2}$  miles from Port. This tomb is situated in a valey, which valley has gardens, houses, &c. The grave is simple for so *great* a man, having no more than a large oblong stone with no inscription, surrounded in same form by iron railings, also with wooden railings round the iron do. leaving a space of about 10 to 15 feet for visitors to walk, & that beautifully green (with grass), with the Willows & Cypresses. Outside the wooden railings is the small well where he constantly every morning used to send for water to wash &c (beautiful clear water). Here is stationed a non-commissioned Officer (an Old Soldier) to take care that no one injures the above. The Willow is strictly forbidden for anyone to touch, but from the Cypresses a small twig is allowed only. At the East end or head of tomb within railings is a Geranium, planted by Lady Warren & Daughter (Admiral Warrens wife), at West end or foot are several (Cape) bulbs &c. The House [is] situated from Tomb about a mile along a ridge of mountains. Went to house the 13th, which is in a very decayed state, one room as a Billiard room for Visitors (wine sold also!), the remaining part serves as a barn & dwelling for the servants of the clergyman who inhabits the new house, which was built for Napoleon, but he (Napoleon) never inhabited it.

The interior part of Island, houses are to be seen in all parts, with patches of cultivation. (Pears, Guayvers &c are to be had here). Here is to be seen the Furze & Blackberry &c, the latter now bearing fruit & very plentiful. The small Birds are numerous & pretty. Partridges (from France, blue feet & beak), Pheasants, the Male of which is said to be very beautiful (now out of season), & indigenous to Island. Horses, Bullocks, Sheep &c are to be seen grazing on hills & valleys in interior. In many parts is very picturesque.

[from Syms Covington's Diary, Mitchell Library MSS. 2009/108]

JULY 9th-13th. I obtained lodgings in a cottage within stone's throw of Napoleon's tomb. I confess, this latter fact possessed with me but little inducement. The one step, between the sublime & the ridiculous, has on this subject been too often passed. Besides, a tomb situated close by cottages & a frequented road, does not create feelings in unison with the imagined resting place of so great a spirit. With respect to the house in which Napoleon died, its



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THE following pages contain Extracts from LETTERS addressed to Professor HENSLOW by C. DARWIN, Esq. They are printed for distribution among the Members of the Cambridge Philosophical Society, in consequence of the interest which has been excited by some of the Geological notices which they contain, and which were read at a Meeting of the Society on the 16th of November 1835.

The opinions here expressed must be viewed in no other light than as the first thoughts which occur to a traveller respecting what he sees, before he has had time to collate his Notes, and examine his Collections, with the attention necessary for scientific accuracy.

CAMBRIDGE,  
Dec. 1, 1835.

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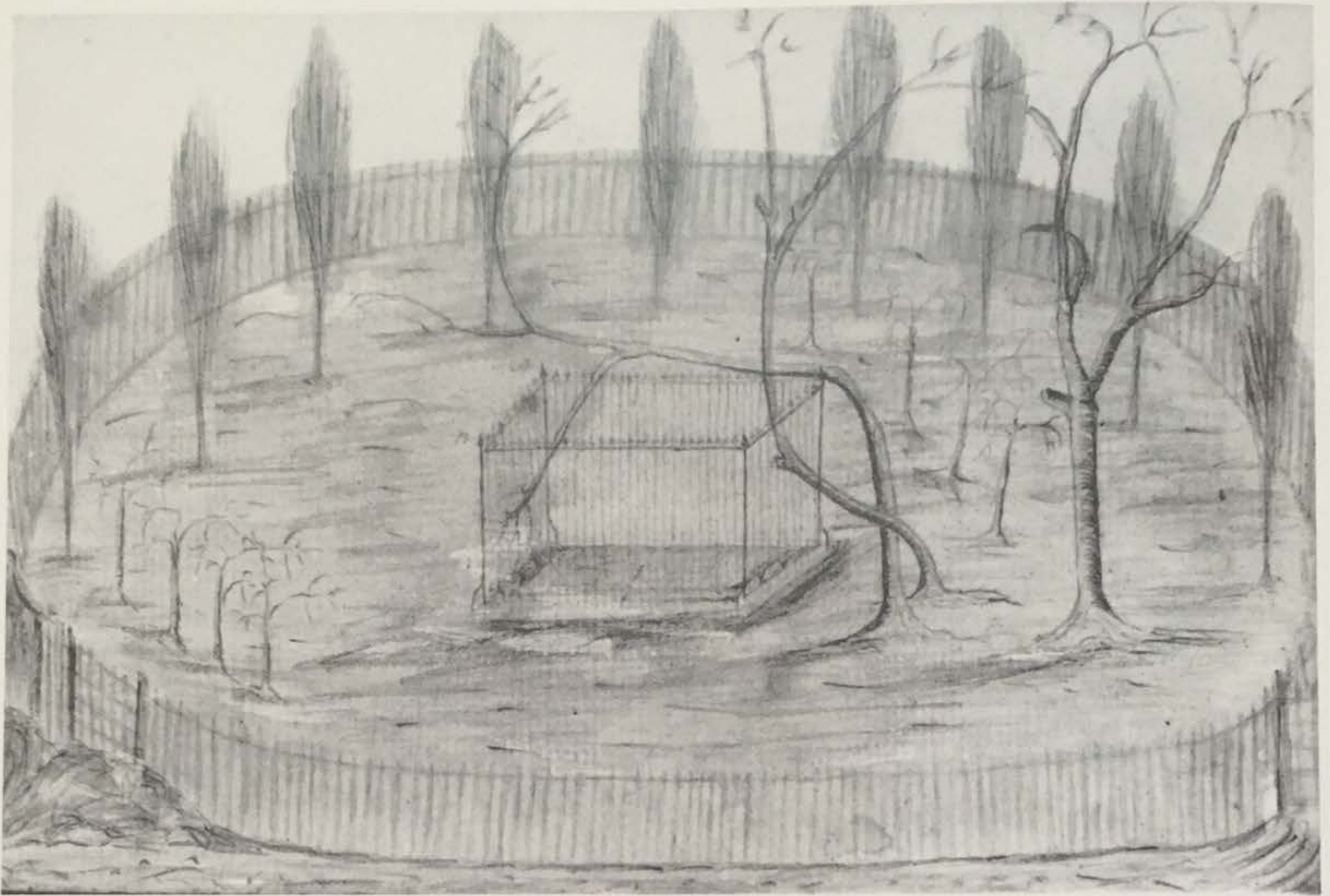
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1836  
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In conclusion, - it appears to me that nothing can be ~~be~~ more improving to a young naturalist, than a journey in distant countries. It both sharpens and partly also allays that want and craving, which as Sir J. Herschell<sup>sm</sup> remarks, a man experiences, ~~when~~ although every corporeal sense is fully satisfied. The excitement from the novelty of objects, and the chance of success stimulates him on to activity. Moreover as a number of isolated facts soon become uninteresting, the habit of comparison leads to generalization. ~~On~~ on the other hand, as the traveller stays but a short space of time in each place, his description must generally consist of mere sketches, instead of detailed observation. Hence arises, (as I have found to my cost) a constant tendency to fill up the wide gaps of knowledge by inaccurate & superficial hypotheses. But I have too deeply enjoyed the voyage not to recommend to any naturalist to take all chances, and to start on travels by land if possible, if otherwise on a long voyage. He may feel assured, he will meet with no difficulties or dangers (excepting in rare cases), nearly so bad, as he before hand imagined. - In a moral point of view, the effect ought to be, to teach him, good humoured patience, ~~unselfishness~~ the habit of acting for himself, and of making the best of every thing, or content

(a) \* *Observations on the History of Natural Philosophy*, p. 3. -





*Napoleon's tomb*

state is scandalous, to see the filthy & deserted rooms, scored with the names of visitors, to my mind was like beholding some ancient ruin wantonly disfigured. During the four days I staid in this central position, from morning to night I wandered over the Isd & examined its geological history. The house was situated at an elevation of about 2000 ft; here the weather was cold & very boisterous, with constant showers of rain; every now & then the whole scene was veiled by thick clouds.

Near to the coast the rough lava is entirely destitute of vegetation, in the central & higher parts a different series of rocks have from extreme decomposition, produced a clayey soil, which is stained in broad bands of many colours, such as purple, red, white & yellow. At this season, the land moistened by constant showers, produces a singularly bright green pasture; this lower & lower down gradually fades away & at last disappears. In latitude  $16^{\circ}$  & at the trifling elevation of 1500 ft, it is surprising to behold a vegetation possessing a decided English character. But such is the case; the hills are crowned with irregular plantations of scotch firs; the sloping banks are thickly scattered over the thickets of gorze, covered with its bright yellow flowers; along the course of the rivulets weeping willows are common, & the hedges are formed of the blackberry, producing its well known fruit. When we consider the proportional numbers of



indigenous plants being 52, to 424 imported species, of which latter so many come from England, we see the cause of this resemblance in character. These numerous species, which have been so recently introduced, can hardly have failed to have destroyed some of the native kinds. I believe there is not any account extant of the vegetation at the period when the island was covered with trees; such would have formed a most curious comparison with its present sterile condition and limited Flora. It is not improbable that even at the present day similar changes may be in progress. Many English plants appear to flourish here better than in their native country; some also from the opposite quarter of Australia succeed remarkably well, & it is only on the highest & steep mountain crests where the native Flora is predominant.

The English, or rather the Welsh character of the scenery, is kept up by the numerous cottages & small white houses, some buried at the bottom of the deepest valleys & others stuck up on the lofty ridges. Certainly some of the views are very striking; I may instance that [of] Sir W. Doveton's house, where the bold peak called Lott, is seen over a dark wood of firs, the whole being backed by the red, waterworn mountains of the Southern shore. But a glowing tropical style of landscape would have afforded a finer contrast, than the homely English scenery, with the wild arid rocks of the coast. On viewing the Isd from an eminence, the first remark which occurs is on the infinite number of roads & likewise of forts. The public expenses, if one forgets its character as a prison, seems out of all proportion to the extent or value of the Island. So little level or useful land is there, that it seems surprising how so many people, (about 5000) can subsist. The lower orders, or the emancipated slaves, are, I believe, extremely poor; they complain of want of work; a fact which is also shewn by the cheap labour. From the reduction in number of public servants owing to the island being given up by the East Indian Company & consequent emigration of many of the richer people, the poverty probably will increase. The chief food of the working class is rice with a little salt meat; as these articles must be purchased, the low wages tell heavily: the fine times, as my old guide called them, when 'Bony' was here can never again return. Now that the people are blessed with freedom, a right which I believe they fully value, it seems probable their numbers will quickly increase: if so, what is to become of the little state of St Helena?

My guide was an elderly man, who had been a goatherd when a boy, & knew every step amongst the rocks. He was of a race many times mixed, & although with a dusky skin, he had not the disagreeable expression of a Mulatto: he was a very civil quiet old man, & this appears the character of the greater part of the lower class. It was strange to my ears to hear a man nearly white, & respectably dressed, talking with indifference of the times when he was a slave. With my companion, who carried our dinners & a horn of water, which latter is quite necessary, as all in the lower valleys is saline, I every day took long walks. Beyond the limits of the elevated & central green circle, the wild valleys are quite desolate & untenanted. Here to the geologist, there are scenes of interest, which shew the successive changes & complicated violence, which have in past times happened. According to my views, St Helena has existed as an island from a very remote



period, but that originally like most Volcanic Isds it has been raised in mass from beneath the waters.

*Diary* pp.410-12

C.D. TO PROFESSOR HENSLOW

St Helena. July 9th 1836

My dear Henslow

I am going to ask you to do me a favor. I am very anxious to belong to the Geolog: Society. I do not know, but I suppose, it is necessary to be proposed some time before being balloted for; if such is the case, would you be good enough to take the proper preparatory steps. Professor Sedgwick very kindly offered to propose me, before leaving England: if he should happen to be in London, I daresay he would yet do so.

I have very little to write about. We have neither seen, done, or heard of anything particular, for a long time past: & indeed if, at present, the wonders of another planet could be displayed before us, I believe we should unanimously exclaim, what a consummate plague. No schoolboys ever sung the half sentimental & half jovial strain of 'dulce domum' with more fervour, than we all feel inclined to do. But the whole subject of dulce domum, & the delight in seeing one's friends is most dangerous; it must infallibly make one very prosy or very boisterous. Oh the degree to which I long to be once again living quietly, with not one single novel object near me. No one can imagine it, till he has been whirled round the world, during five long years, in a ten Gun-Brig.

I am at present living in a small house (amongst the clouds) in the centre of the Isld & within stone's throw of Napoleon's tomb. It is blowing a gale of wind, with heavy rain, & wretchedly cold: if Napoleon's ghost haunts his dreary place of confinement, this would be a most excellent night for such wandering Spirits. If the weather chooses to permit me, I hope to see a little of the Geology (so often partially described) of this Isd. I suspect that differently from most Volcanic Islds its structure is rather complicated. It seems strange, that this little centre of a distinct creation should, as is asserted, bear marks of recent elevation.

The Beagle proceeds from this place to Ascension, thence to C. Verds (what miserable places!) to the Azores, to Plymouth & then to Home. That most glorious of all days in my life will not however arrive till the middle of October. Some time in that month, you will see me at Cambridge, when I must directly come to report myself to you, as my first Lord of the Admiralty. At the C. of Good Hope we all on board suffered a bitter disappointment in missing nine months' letters, which are chasing us from one side of the globe to the other. I daresay amongst them was a letter from you; it is long since I have seen your hand writing, but I shall soon see you yourself, which is far better. As I am your pupil, you are bound to undertake the task of criticizing & scolding me for all the things ill done & not done at all, which I fear I shall need much; but I hope for the best, & I am sure I have a good, if not too easy, task master.

At the Cape, Capt Fitz Roy & myself enjoyed a memorable piece of good fortune in meeting Sir J. Herschel. We dined at his house & saw him a few times



besides. He was exceedingly goodnatured, but his manners at first appeared to me rather awful. He is living in a very comfortable country house, surrounded by fir & oak trees, which alone, in so open a country, give a most charming air of seclusion & comfort. He appears to find time for everything; he showed us a pretty garden, full of Cape Bulbs of his own collecting; & I afterwards understood, that everything was the work of his own hands. What a very nice person Lady Herschel appears to be – in short we were quite charmed with everything in & about the house. There are many pleasant people at the Cape. Mr Maclear, the astronomer, was most kind & hospitable. I became also acquainted with Dr A. Smith, who had just returned from his expedition beyond the Tropic of Capricorn. He is a cap[ital] person & most indefatigable-observer: he has brought back an immense collection, & amongst other things a new species of Rhinoceros. If you had heard him describe his system of travelling & mode of defence, it would have recalled the days of enthusiasm, which you have told me, you felt on first reading *Le Vaillant*. Dr Smith shortly goes to England, he will soon return & recommence his travels & either succeed in penetrating far into the interior, or, as he says, leave his bones in Africa. I am very stupid, & I have nothing more to say; the wind is whistling so mournfully over the bleak hills, that I shall go to bed & dream of England. Good night, My dear Henslow

Yours most truly obliged & affectionately  
Chas Darwin.

*Darwin & Henslow* pp.115–17

The *Beagle* next called briefly at Ascension Island, where Darwin left another letter and with unflagging enthusiasm examined the geology of the island.

JULY 21st & 22nd. On the two succeeding days I took long walks & examined some rather curious points in the mineralogical composition of some of the Volcanic rocks, to which I was guided by the kindness of Lieut Evans. One day I walked to the S.W. extremity of the Isld: the day was clear & hot, & I saw the Island not smiling with beauty, but staring with naked hideousness. The lava streams are covered with hummocks, & are rugged to a degree which, geologically speaking, is not of easy explanation. The intervening spaces are concealed with layers of pumice, ashes, & volcanic sandstone. In some parts, rounded volcanic bombs, which must have assumed this form when projected red hot from the crater, lie strewn on the surface. When passing this end of the Isld at sea, I could not imagine the cause of the white patches, with which the whole plain was mottled: I now found out it was owing to the number of sea-fowl, which sleep in such full confidence, as even in midday to allow a man to walk up to & seize hold of them. These birds were the only living creatures I this day saw. On the beach a great sea, although the breeze was light, was tumbling over the broken lava rocks. The ocean is a raging monster, insult him a thousand miles distant, & his great carcass is stirred with anger through half an hemisphere.

*Diary* p.415



C.D. TO MISS CAROLINE DARWIN

[*Beagle*, at sea] July 18th 1836

My dear Caroline

We are at this present moment driving onwards with a most glorious tradewind towards Ascension. I am determined to pay the debt of your most excellent correspondence by at least writing to you all as often as I can. I will leave this letter at Ascension to take its chance of being forwarded. Before attempting to say anything else, I must disburthen my mind of the bad news that our expected arrival in England recedes, as we travel onwards. The best judges in the Ship entertain little hopes of it, till the end of October. The next three months appear infinitely tedious & long, & I daresay the last three weeks will be worse, as for the three closing days, they by the same rule, ought to be intolerable. I feel inclined to write about nothing else, but to tell you over & over again, how I long to be quietly seated amongst you. How beautiful Shropshire will look, if we can but cross the wide Atlantic before the end of October. You cannot imagine how curious I am to behold some of the old views, & to compare former with new impressions. I am determined & feel sure, that the scenery of England is ten times more beautiful than any we have seen. What reasonable person can wish for great ill proportioned mountains, two & three miles high? No, no, give me the Brythen or some such compact little hill. And then as for great boundless plains & impenetrable forests, who would compare them with the green fields & oak woods of England? People are pleased to talk of the ever smiling sky of the Tropics: must not this be precious nonsense? Who admires a lady's face who is always smiling? England is not one of your insipid beauties; she can cry, & frown, & smile, all by turns. In short I am convinced it is a most ridiculous thing to go round the world, when by staying quietly, the world will go round with you.

But I will turn back to the past, for if I look forward, I lose my wits, & talk nonsense. The *Beagle* staid at St Helena five days, during which time I lived in the clouds in the centre of the Isd. It is a curious little world within itself; the habitable part is surrounded by a broad band of black desolate rocks, as if the wide barrier of the ocean was not sufficient to guard the precious spot. From my central position I wandered on foot nearly over the whole Island; I enjoyed these rambles more than I have done any thing for a long time past. The structure of the Isd is complicated & its geological history rather curious. I have discovered a monstrous mistake which has been handed from one book to the other without examination. It has been said that sea shells are found on the surface of the land at an elevation little short of 2000 ft, & hence that this Isd. though possessing an entirely unique Flora, must have been raised within a late period from beneath the Ocean. These shells turn out land shells! But what is very singular, they have ceased to exist in a living state on the Isd.

I heard much of old General Dallas & his daughters. People speak very well of him – as a well intentioned old goose. He took much pains in improving the road & other public works, was most hospitable, magnificent, & popular. The young ladies were the gayest of the gay. Finally he was the last of the E. Indian



Company's Governors, with an income more than quadruple the present. Hence perhaps the lamentations at his departure.

From St Helena I wrote to Erasmus a long & a heavy letter all about myself, it was directed to the Wyndham Club. I most earnestly hope Erasmus will not be wandering on the continent about the time of the Beagle's return; I am delighted he has taken a house, as he will more probably now be a fixture. I shall really have so much to say, that I fear I shall annihilate some of my friends. I shall put myself under your hands, & you must undertake the task of scolding, as in years long gone past, & of civilizing me. Oh for the time when we shall take a ride together on the Oswestry road. My dear Caroline I do long to see you, & all the rest of you, & my dear Father. God bless you all

Your most affectionate brother,  
Chas Darwin.

P.S. I have kept this flap open in case of receiving any letters tomorrow when we reach Ascension.

*[written in pencil on the outer flap]*

There is a Ship in the offing & this must go. There are letters, but the bundle has not been opened.

*Darwin and Beagle* pp. 142-4

Doubtless to the disappointment of all on board, the *Beagle* did not sail directly for England on July 23rd, but crossed the Atlantic once more to make some final observations in Bahia. Darwin wrote his last letter from the ship.

C.D. TO MISS SUSAN DARWIN

The last letter.

August 4th. Bahia, Brazil

My dear Susan

I will just write a few lines to explain the cause of this letter being dated on the coast of S. America. Some singular disagreements in the Longitudes made Capt F R. anxious to complete the circle in the Southern hemisphere, & then retrace our steps by our first line to England. This zig-zag manner of proceeding is very grievous; it has put the finishing stroke to my feelings. I loathe, I abhor the sea, & all ships which sail on it. But I yet believe we shall reach England in the latter half of October.

At Ascension I received Catherines letter of October & yours of November; the letter at the Cape was of a later date; but letters of all sorts are inestimable treasures, & I thank you both for them. The desert, Volcanic rocks & wild sea of Ascension, as soon as I knew there was news from home, suddenly wore a pleasing aspect; & I set to work with a good will at my old work of Geology. You would be surprised to know how entirely the pleasure in arriving at a new place depends on letters. We only staid four days at Ascension & then made a very good passage to Bahia. I little thought ever to have put my foot on a S. American coast again. It has been almost painful to find how much good enthusiasm has been evaporated during the last four years. I can now walk soberly through a Brazilian



forest; not but what it is exquisitely beautiful, but now instead of seeking for splendid contrasts, I compare the stately Mango trees with the Horse Chestnuts of England. Although this zigzag has lost us at least a fortnight, in some respects I am glad of it. I think I shall be able to carry away one vivid picture of intertropical scenery. We go from hence to the C. de Verds, that is if the winds or the Equatorial calm will allow us. I have some faint hopes that a steady foul wind might induce the Captain to proceed direct to the Azores. For which most untoward event I heartily pray.

Both your letters were full of good news – especially the expressions which you tell me Prof. Sedgwick used about my collections – I confess they are deeply gratifying. I trust one part at least will turn out true, & that I shall act, as I now think – that a man who dares to waste one hour of time has not discovered the value of life. Prof. Sedgwick mentioning my name at all gives me hope that he will assist me with his advice, of which in my geological questions, I stand much in need.

It is useless to tell you, from the shameful state of this scribble, that I am writing against time; having been out all morning, & now there are some strangers on board to whom I must go down & talk civility. Moreover, as this letter goes by a foreign ship, it is doubtful whether it ever will arrive. Farewell, my very dear Susan & all of you.

Goodbye.  
C. Darwin

*Darwin and Beagle* pp.144–6

The *Beagle* was still 5000 miles from home. Leaving Bahia on August 12th, and calling briefly at Recife (Pernambuco), Praia (Cape Verde Islands), Terceira and Sao Miguel (Azores), she anchored at Falmouth on October 2nd, and that night Darwin started by the Mail for Shrewsbury. The voyage had lasted four and three quarter years.

FitzRoy became convinced that all they had seen was compatible with the account of the Creation in the book of Genesis.

To account for offering a few remarks on a subject so important and difficult as that of the Deluge, I beg to say that reflections, arising out of facts witnessed during the *Beagle's* voyage, have occasioned them; and, as results of that expedition, it has appeared to me that they are neither irrelevant to the narrative, nor likely to be altogether uninteresting to young men in the navy.

I suffered much anxiety in former years from a disposition to doubt, if not disbelieve, the inspired History written by Moses. I knew so little of that record, or of the intimate manner in which the Old Testament is connected with the New, that I fancied some events there related might be mythological or fabulous, while I sincerely believed the truth of others; a wavering between opinions, which could only be productive of an unsettled, and therefore unhappy, state of mind. Some young men, I am well aware, are in a similar condition, while many others are content to set aside all reflection, and do as the world does; or rather, as those do



among whom they generally live. Natural affection and respect for good parents, relations, and elders, never can lead a young man astray; but there is, perhaps, no guide more fallible or dangerous than the common custom of those inexperienced persons who associate together, chiefly for lack of fixed occupation; and whose principal object is to drive away self-examination, or prolonged thought, by a continual succession of idle amusement, or vivid excitement.

Wholesome and necessary as amusement and recreation are, both for mind and body, every one knows how insipid, even painful their excess becomes; and external evidence shows but too plainly where the happiness, the blessings, and the comfort men might enjoy, have by themselves been slighted, or destroyed, from forgetting the line between using, and abusing; and by turning a deaf ear to the reflection that they are but 'tenants at will'.

Much of my own uneasiness was caused by reading works written by men of Voltaire's school; and by those of geologists who contradict, by implication, if not in plain terms, the authenticity of the Scriptures; before I had any acquaintance with the volume which they so incautiously impugn. For geology, as a useful branch of science, I have as high a respect as for any other young branch of the tree of knowledge, which has yet to undergo the trial of experience; and no doubt exists in my own breast that every such additional branch, if proved by time to be sound and healthy, will contribute its share of nourishment and vigour to the tree which sprung from an immortal root. For men who, like myself formerly, are willingly ignorant of the Bible, and doubt its divine inspiration, I can only have one feeling – sincere sorrow.

Few have time, as well as inclination, to go far into both sides of any question; but truth can hardly be drawn out of the well unless some exertion be made, in examining each argument, or in selecting a well-tryed and experienced guide. It is idle to say, as I have heard asserted, that such works as those above-mentioned do little harm; experience proves the contrary; of which I am made painfully aware, not only by my own conscience, but by conversation with friends.

While led away by sceptical ideas, and knowing extremely little of the Bible, one of my remarks to a friend, on crossing vast plains composed of rolled stones bedded in diluvial detritus some hundred feet in depth, was 'this could never have been effected by a forty days' flood' – an expression plainly indicative of the turn of mind, and ignorance of Scripture. I was quite willing to disbelieve what I thought to be the Mosaic account, upon the evidence of a hasty glance, though knowing next to nothing of the record I doubted – and I mention this particularly, because I have conversed with persons fond of geology, yet knowing no more of the Bible than I knew at that time. Thus much I feel it necessary to say, in accounting for my own approach to a subject in which all men feel deeply interested; and which has therefore been so well treated of, that these remarks would be useless, were it not that they may reach the eyes of young sailors, who have not always access to works of authority.

The Mosaic account of the Creation is so intimately connected with that of the Deluge that I must ask my young reader (whom alone I presume to address on this subject) to turn to the first chapter of Genesis, and refer to a few verses with me.



We soon find a remarkable fact, which shows to my mind that the knowledge of Moses was super-human: his declaration in an early age that light was created before the sun and moon, which must till then have appeared to be the sources of light. In the fourth verse it is stated that 'God divided the light from the darkness.' This may have been effected by a rotation of the earth on its axis, turning each side in succession to the light; otherwise, had the earth remained stationary, light must have been destroyed to admit darkness, and there must have been repeated creations of light. The light was called day – 'and the evening and the morning were the first day'. Of course there could have been no morning previous to the creation of light; and the first portion of time, consonant to our present expressions, would have been that which elapsed between light and darkness, or evening. The length of a day being determined by the rotation of the earth on its axis; turning round once, so as to make an evening and a morning to each spot on the globe; the time occupied by that rotation is a natural object of interest. In the 12th verse it is said that grass, herbs, and trees, were brought forth; in the 14th and 16th, that lights were made to divide the day from the night; and that the greater light was to rule the day. It is known that neither trees, herbs, nor grass can exist long without the light and heat of the sun, therefore the rotation of the earth between the third day, when vegetation was produced, and the fourth, could not have been very different, in velocity, from its present rotation. Some men, of rare abilities, have thought that the 'days' of creation were indefinite periods, notwithstanding the statement in verse 14, which affirms that the lights in the firmament of heaven were to divide the day from night; and to 'be for signs, and for seasons, and for days, and years'. In this one verse do we not see that the day was less than a year (signs and seasons, days and years); for had the day there meant been more than a year would not the words have been differently placed, namely – signs and seasons, years and days? Can we think that day means one space of time in the former part, and another space of time in the latter part of that one verse? Another indication that the word day, used in the first chapter of Genesis, does not mean a period much, if at all, longer than our present day, is – that it is spoken of as alternating with night. Although the word day is used in other chapters of the Bible, even so soon as the 4th verse of the 2d chapter of Genesis, to express a period, or space of time longer than our present day, the word night is never so applied – hence, as the earth turns uniformly on its axis, and, so far as we can reason from analogy, must have turned uniformly, while turning at all, the word night in the 5th verse interprets the length of a day.

Some have laid stress upon the declaration that a thousand years are with the Lord as one day – but what is the context? To lengthen the day to a thousand years, on account of this and a similar expression, is not more reasonable than it would be to reduce it to a night-watch. What is a watch in the night when passed? – next to nothing – so are a thousand years with the Almighty. These considerations tend to show how, without Chaldee or Hebrew learning, a man, with a common English education, may convince himself of a fact which has lately been so much controverted.

Partly referring to such indefinite periods as we have been discussing, and



partly to reasoning unaided by revelation, some geologists have said that there were successive creations, at intervals of vast duration. They have imagined an age in which only the 'so-called' lowest orders of animated creatures existed,<sup>1</sup> an age of fishes, an age of reptiles, an age of mammalia, and an age in which man appeared: statements which have obtained much attention. Fossil fishes and shell mollusca have been found in coal measures, and in subjacent formations: how could this have happened if vegetables had been produced first; then swept away and converted into coal, and that afterwards the lower orders of animals had appeared? We know that the fossil plants of the coal formations are similar in structure to vegetables now growing on the earth, which cannot flourish without warmth, and the light of the sun. Vegetation was produced on the third day, the sun on the fourth. If the third day was an age, how was the vegetable world nourished? But anomalies such as these appear to be endless in most geological theories: I will leave them for the present and continue my course.

In the 16th verse it is said that 'God made two great lights; the greater light to rule the day, the lesser light to rule the night: the stars also'; that is, he made the stars also.

It is not stated here that the Almighty made all the stars at that time; nor can I, after consulting very able men, find any passage of such an import. That all the stars dependant upon, or connected with, our solar system, namely, the planets and their satellites, were then created, seems to be evident from the fact of their revolving round our sun; but farther than this, it is not thought necessary (may we not presume) for man to know; therefore it is not revealed to us. In the ancient book of Job, the creation of the world is thus alluded to. 'Who laid the corner stone thereof, when the morning stars sang together, and all the sons of God shouted for joy.' But the earth was finished, and vegetation produced, before the creation of stars mentioned in Gen. i. 16; therefore, unless the 'corner-stone' alludes to man, it may be inferred that there were stars in existence besides those made on the fourth day. Of course, the 'singing of the stars' is a figurative expression; but as we do not meet with any similar metaphor in the Bible, unconnected with some object that we know exists; we may infer that stars existed when the allegorical, or mystical corner-stone was thus laid.

In verses 29 and 30, the food for man and beast is mentioned, and with reference to the Deluge this should be borne in mind. It may be said that the teeth of some animals are so formed as to be fit only for grazing, or browsing; that beasts of prey have teeth adapted to tearing and gnawing; and that man requires meat; but we must remember that dogs and wild beasts thrive upon a vegetable diet, and that some men never touch meat, even in the present state of the world:

<sup>1</sup>In classing one order of creatures above or below others, we may perhaps consider them as they appear to our apprehension, in comparison with others, but we must beware of thinking them more or less imperfect. Every creature is perfectly adapted to the condition and locality for which it is designed, and absolutely perfect (speaking generally). Some that are intended to live in the dark; or some that are to exist under pressure; may at first sight appear to us imperfect; perhaps shapeless, unsightly objects: but, after examination into their natural history, our hasty remark is succeeded by expressions of astonishment at such wonderful arrangements of Providence as are shewn – even in the most shapeless sea slug. Multitudes of creatures exist now, especially in the sea, quite as apparently imperfect as those of the so called lowest order of animated creation, whose impressions are found in solid rocks. There may also be animals in deep waters that could not exist except under pressure.



very different probably from its condition before the flood, as may be concluded from the inferior duration of human life.

The 2d and 3d verses of chap. ii, recall to mind the wonderful fact that the seventh day has been a marked division of time from the earliest period of historical record.

It is now well known that all nations, and almost all tribes of the human race, preserve traditions of a great flood in which nearly all men were destroyed: and it is also established as a fact, that nearly all parts of the earth, hitherto examined, bear witness to their having been at some time covered by the ocean. Instead of ascribing these effects to the universal deluge, many geologists say that the earth is in a continual, though gradual state of change; that in consequence of this general mobility, places now far above the sea were once beneath it; that districts, or countries, may have been inundated in one quarter, and other regions elsewhere, but that an universal deluge never could have happened. This is implied plainly enough, if not asserted, in several geological works.

In the Beagle's examination of the southern parts of South America, I had opportunities of observing immense tracts of land composed, solely, of fossil shells, bones, and an earth which looked like dried sandy mud; extensive ranges of country where no solid rock could be found, only rolled or shingle stones, embedded to a great depth in earth, exactly like that described above; and a wide district, at least fifty miles across, covered with lava of which the surface was nearly horizontal. (San José, San Julian, Santa Cruz.)

I brought to England many specimens of these shells, which, although taken from within a few feet of the surface of the land, were found to have been pressed together, crushed, and penetrated by mud, in a manner that never could have been caused by the weight of earth then lying above them, because, though solid, it could neither have mashed the shells, nor worked into their inmost recesses. It seems evident to me that those shells have undergone enormous pressure beneath an ocean, when they were surrounded with mud. But previous to such pressure, the shells must have grown naturally somewhere: — certainly not at the bottom of an ocean; because they are shells of a comparatively delicate structure which are usually found within a few feet of low water; some at least of the number being identical with living species.

If the square miles of solid land in which those myriads of shells are now embedded, had been upheaved (as geologists say), either gradually, or rapidly, shells could not be found there in their present confused and compressed state. Had the land sunk down many thousand feet with shells upon it, they might have been covered with mud, and on being afterwards upheaved again they would have appeared embedded regularly where they grew, in a matrix which, with the pressure of a superincumbent ocean, might have flattened and penetrated them: but they would not have been torn away from their roots, rolled, broken, mashed, and mixed in endless confusion, similarly to those now in my possession.

There is also another consideration: geologists who contend for the central heat of the earth assert that substances subjected to great pressure under the sea become altered: hence, in conformity with their theory, these shells could not



have been long buried under a deep ocean, and afterwards raised in their pristine state. So little changed are these shells, except in form, that they appear as if they had been heaped together and squeezed in mud within a few years from the present time.

One remarkable place, easy of access, where any person can inspect these shelly remains, is Port San Julian. There, cliffs, from ten to a hundred feet high, are composed of nothing but such earth and fossils; and as those dug from the very tops of the cliffs are just as much compressed as those at any other part, it follows that they were acted upon by an immense weight not now existing. From this one simple fact may be deduced the conclusions – that Patagonia was once under the sea; that the sea grew deeper over the land in a tumultuous manner, rushing to and fro, tearing up and heaping together shells which once grew regularly or in beds: that the depth of water afterwards became so great as to squeeze or mass the earth and shells together by its enormous pressure; and that after being so forced down, the cohesion of the mass became sufficient to resist the separating power of other waves, during the subsidence of that ocean which had overwhelmed the land. If it be shewn that Patagonia was under a deep sea, not in consequence of the land having sunk, but because of the water having risen, it will follow as a necessary consequence that every other portion of the globe must have been flooded to a nearly equal height, at the same time; since the tendency to equilibrium in fluids would prevent any one part of an ocean from rising much above any other part, unless sustained at a greater elevation by external force; such as the attraction of the moon, or sun; or a strong wind; or momentum derived from their agency. Hence therefore, if Patagonia was covered to a great depth, all the world was covered to a great depth; and from those shells alone my own mind is convinced, (independent of the Scripture) that this earth has undergone an universal deluge.

The immense fields of lava, spoken of in a preceding page [*Narrative 2*, p.633], and which to an ordinary observer appear to be horizontal, are spread almost evenly over such an extent of country, that the only probable conclusion seems to be, that the lava was ejected while a deep sea covered the earth, and that tidal oscillations, combined with immense pressure, spread and smoothed it, while in a rapidly cooling though viscous state, over the surface of the land.

The vast quantity of shingle, or rounded stones of all sizes, may be accounted for in a manner unconnected with that of water acting upon a shore; though doubtless a great proportion of the shingle we see has been rounded in that manner. Melted stone, thrown out of a volcano, and propelled through water with great velocity, might be rounded and cooled as shot are when dropped into water from a tower. In modern volcanoes we observe that some matter is thrown into the air, while other, and the greater quantity, runs over the edges of a crater, overflowing the adjacent tracts of land.

Proceeding to the west coast of South America, we find that near Concepcion there are beds of marine shells at a great height above the level of the sea. These, say geologists, were once under the ocean, but, in consequence of the gradual upheaval of the land, are now far above it. They are closely compressed together,



and some are broken, though of a very solid and durable nature; and being near the surface of the land are covered with only a thin stratum of earth. They are massed together in a manner totally different from any in which they could have grown, therefore the argument used in Patagonia is again applicable here. But in addition to this, there is another fact deserving attention: namely, that there are similar beds of similar shells, (identical with living species) about, or rather below the level of the present ocean, and at some distance from it.

In crossing the Cordillera of the Andes Mr Darwin found petrified trees, embedded in sandstone, six or seven thousand feet above the level of the sea: and at twelve or thirteen thousand feet above the sea-level he found fossil sea-shells, limestone, sandstone, and a conglomerate in which were pebbles of the 'rock with shells'. Above the sandstone in which the petrified trees were found, is 'a great bed, apparently about one thousand feet thick, of black augitic lava; and over this there are at least five grand alternations of such rocks, and aqueous sedimentary deposits, amounting in thickness to several thousand feet'. These wonderful alternations of the consequences of fire and flood, are, to me, indubitable proofs of that tremendous catastrophe which alone could have caused them – of that awful combination of water and volcanic agency which is shadowed forth to our minds by the expression 'the fountains of the great deep were broken up, and the windows of heaven were opened'.

The upheaval of the island of Santa Maria has been quoted by geologists, from my statement; and it will be interesting to learn whether that island has remained at its new elevation, or whether, like the shore at Talcahuano, it has sunk down again. If the coast in that neighbourhood has been gradually rising, it is strange that old Penco Castle should still stand so low [p. 260 above].

In Mr Lyell's *Elements of Geology*, he mentions Mr Darwin having found, near Callao, 'at the altitude of eighty-five feet above the sea, pieces of cotton thread, plaited rush, and the head of a stalk of Indian corn, all of which had evidently been imbedded with the shells' (marine). 'At the same height on the neighbouring mainland, he found other signs corroborating the opinion that the ancient bed of the sea had there also been uplifted eighty-five feet, since the region was first peopled by the Peruvian race.' The neighbourhood of Lima has suffered from immense waves caused by earthquakes, and the relics found among the shells may have been scattered by one of those waves. The bed of shells may have been disturbed by the earthquake and its consequences, the ground may have been rent, and afterwards closed again, or the opening may have been filled up by loose earth and anything lying on it, as has taken place at Concepcion. That the country near Callao, or Lima, has not been upheaved, to any sensible amount, since the last great earthquake, which was accompanied by a wave that swept over and destroyed Callao, is evident from the present position of a pillar erected soon after that event to mark the place to which the waves advanced inland. This pillar now stands so low, that waves, such as those which ruined Talcahuano, would inevitably reach its base; again destroying the whole of Callao, still situated on a flat, very few feet above the sea, near where old Callao stood.

I have now mentioned the principal facts connected with the Beagle's voyage,



which I am desirous of noticing with reference to the Deluge. Want of space prevents my adding others: I have hardly room left to lay before my young readers some general considerations, arising partly out of these facts, which I hope may interest – perhaps be useful to them.

When one thinks of the Deluge, questions arise, such as ‘where did the water come from to make the flood; and where did it go to after the many months it is said to have covered the earth?’ To the first the simplest answer is ‘from the place whence the earth and its oceans came’ – the whole being greater than its part, it may be inferred that the source which supplied the whole could easily supply an inferior part – and, to the second question, ‘part turned into earth, by combination with metallic bases; part absorbed by, and now held in the earth; and part evaporated’. We know nothing of the state of the earth, or atmosphere surrounding it, before the Flood; therefore it is idle and unphilosophical to reason on it, without a fact to rely on. We do not know whether it moved in the same orbit; or turned on its axis in a precisely similar manner; whether it had then huge masses of ice near the poles; or whether the moon was nearer to it, or farther off. Believers in the Bible know, however, that the life of man was very much longer than it now is, a singular fact, which seems to indicate some difference in atmosphere, or food, or in some other physical influence. It is not so probable that the constitution of man was very different (because we see that human peculiarities are transmitted from father to son), as it is to suppose that there was a difference in the region where he existed. It is easy to settle such speculations by the reflection – ‘It was the will of Him who is Almighty’; but as in most cases we see that secondary causes are employed to work out His will, we may imagine that the extraordinary prolongation of man’s existence was effected by such means.

Connected with these questions respecting the additional quantity of water is the reflection that the amount must have been very great. This may be placed in another light. Sir John Herschel says, ‘On a globe of sixteen inches in diameter such a mountain (five miles high) would be represented by a protuberance of no more than one hundredth part of an inch, which is about the thickness of ordinary drawing paper. Now as there is no entire continent, or even any very extensive tract of land, known, whose general elevation above the sea is any thing like half this quantity, it follows, that if we would construct a correct model of our earth, with its seas, continents, and mountains, on a globe sixteen inches in diameter, the whole of the land, with the exception of a few prominent points and ridges, must be comprised on it within the thickness of thin writing paper; and the highest hills would be represented by the smallest visible grains of sand.’ Such being the case, a coat of varnish would represent the diluvial addition of water; and how small in addition to the mass does it appear!

Let us now refer briefly to the recorded account of the Flood. Without recapitulating dates and events, I will at once advert to the ark: an immense vessel, constructed of very durable wood, and well stored with vegetable provision for all that it contained. Some cavillers have objected to the heterogeneous mixture of animals embarked; on the ground that they could not have been assembled; and would have destroyed one another. We may reply: He



who made, could surely manage. But, without direct miraculous interposition (though we should never forget that man is a miracle, that this world is a miracle, that the universe is a miracle), imagine the effect that would be produced on the animal creation by the approach of such a war of elements. Do we not now find animals terrified by an earthquake – birds shunning the scene of violence – dogs running out of a town, and rats forsaking a sinking ship? What overcoming terror would possess the animated beings on an island, if it were found to be rapidly sinking while worse than tropical torrents, aggregated water-spouts, thunder and lightning, earthquakes and volcanic eruptions united to dismay, if not to paralyse, the stoutest human heart: yet such probably would be but a faint similitude of the real deluge. Those who have themselves witnessed the war of elements, in some regions of our globe, are perhaps more able to conceive an idea, however inadequate, of such a time, than persons who have scarcely travelled beyond Europe, or made more than ordinary sea voyages. Happily for man, hurricanes or typhoons occur but rarely: earthquakes, on a great scale; their overwhelming waves; and devastating eruptions of volcanoes, still less often. That the approach of a general calamity would have affected animals, what we now see leads us to infer, and that many would have fled to the ark, is only in accordance with the wonderful instinct they are gifted with for self-preservation. Proud man would, in all probability, have despised the huge construction of Noah, and laughed to scorn the idea that the mountains could be covered, even when he saw the waters rising. Thither, in his moral blindness, he would have fled, with numbers of animals that were excluded from the ark, or did not go to it; for we do not see all animals, even of one kind, equally instinctive. As the creatures approached the ark, might it not have been easy to admit some, perhaps the young and the small, while the old and the large were excluded?<sup>1</sup> As we do not know what was the connection or partition of land, before the deluge; how the creatures were distributed; or, what was the difference of climate between one region and another; we cannot say that any particular kind could not have been near the ark because of crossing the sea, or having far to travel.

There is abundant proof that animals have changed their habits, shape, coat, colour, or size, in consequence of migration, or transportation to different climates; therefore we cannot tell, from what is now seen, what alterations have taken place since their second dispersion.

<sup>1</sup>The small number of enormous animals that have existed since the Deluge, may be a consequence of this shutting out of all but a very few. We are not told how many creatures died in the ark; some of those least useful to man may have gone: but, even if none died, the few that quitted the ark could hardly have long withstood the rapid increase of enemies, unless their increase had been proportionably quick. Whether Job had himself seen, or only heard of, the leviathan and the behemoth, does not appear; but that those monsters were the megalosaurus and the iguanodon there seems to be little doubt. Excepting the serpent in Africa, which opposed the passage of Regulus and a Roman army, I am not aware whether profane history mentions any well-authenticated instance of such enormous reptiles; but I cannot look at our representations of dragons, wyverns, griffins, &c. without thinking that, at least, tradition must have handed down the memory of some such monsters; even if a stray one here and there did not actually live in the earlier historical ages: pterodactyles, plesiosaurs, ichthyosaurs, &c. are too like them, in general figure, to admit of this idea being treated as altogether chimerical. Tradition, no doubt exaggerated by imagination, may have handed down the fact of such creatures having once existed: indeed the casual finding of a skeleton might confirm reports, if not originate them.



Many able men have pointed out how water penetrating to metallic bases, may cause volcanic eruptions; how matter thrown up, and materials torn or washed off the earth may have combined, mechanically as well as chemically; how gases may have assisted the transformations: how creatures may have been instantaneously overwhelmed, or gradually entombed; how lime may have been one among many powerful agents; how seeds, and spawn, and the germs of insects may have been preserved; and why, among such multitudes of fossil remains as we now find, only in a few places are there remains of man incontrovertibly fossil.

Still there are some points but lightly touched, or unnoticed, by any person whose works bearing particularly on this subject I have yet seen. One is the rapidity with which certain substances combine under water, and form stone; such, for instance, as those used in Roman cement: another is the possibility of fragile substances, such as shells, small creatures, leaves, corallines, branches, &c., being enveloped in a muddy matrix, while floating at various depths, according to their specific gravities; and the precipitation (chemically speaking) or consolidation, or simple deposition of such cohering masses.

The similarity of coal to asphalte inclines one to suspect an identity of origin; and that coal, in a fluid state, enveloped quantities of vegetable matter – was for some time agitated by the continual tides and tidal currents of the diluvial ocean, and afterwards hardened by cooling, by pressure, or by chemical change; if not by all three. We find the impressions of leaves, stems, and branches – and even large woody trunks embedded in coal: but that the matrix, in which the leaves were enveloped and subjected to pressure, was not triturated vegetable matter is probable, because the casts of delicate vegetable substances found in it show few, if any, signs of friction or maceration. The impressions are as beautifully perfect as those of shells in fossils where the shell itself has disappeared. Might we not as well say that limestone was formed out of decomposed or pulverised shells, as assert that coal was formed out of the luxuriant herbage, the ferns and the palms, of a former state of the world?

Asphalte is at first buoyant; that trees and other vegetable productions are so I need not remark; but coal sinks in water, and asphalte may be altered chemically so as to sink like coal. Experiments on the asphalte of the famous lake at Trinidad have proved that there is so very close an analogy between that substance and coal, that a gas, exactly resembling coal gas, and burning equally well; a bituminous oil; a substance like coaltar; and a residuum, similar to coke; result from its distillation.

Electricity may have been a powerful agent in crystallization; in the rapid deposition of strata; in the formation of mineral veins; in earthquakes and volcanoes; in the formation or decomposition of water; and in other ways of which we are yet, and perhaps ever shall be, totally ignorant.

Successive strata may have been rapidly deposited by tidal oscillations and currents, aiding chemical or mechanical combinations.

The depth to which bodies would sink in an ocean several miles deep has not been proved, and there is reason to think that it is much less than people generally imagine. An eminent man has said that a knowledge of 'the depression of the bed



of the ocean below the surface, over all its extent, is attainable (with whatever difficulty and however slowly) by direct sounding'; and, in consequence of a conversation on this subject with him in 1836, he wrote to me, suggesting a mode which might be tried. I consulted with a friend as to the possibility of success, and his letter, taken in connection with the facts related by Scoresby; with what has been found by those who have sounded to great depths; and with my own practical experience in sounding – has induced me to think that man never will reach the lowest depths of the deepest oceans by any method his ingenuity may contrive; – because the water increases in density with the depth, in a ratio perhaps more than arithmetical. Every seaman knows that in sounding at great depths very heavy leads must be used with ordinary lines, or very thin lines with ordinary leads; the object being the same – that of overcoming the augmenting buoyancy of the line by a weight unusually heavy. But line, such as is used for sounding, is not buoyant at the surface of the sea; a coil of it thrown overboard sinks directly. Then what is it that causes any weight attached to a sounding-line to sink slower and more slowly, after the first few hundred fathoms, the deeper it penetrates; if not the increased resistance to sinking, found by the weight and line? 'Friction, caused by passing through the water', I may be told. Can that friction be compared with the augmented tendency to sink that would be given by the continually increasing weight of line, if the water did not increase in density?

The pressure of the column of water over any weight, after it has been sunk some hundred fathoms, is shown by the time and exertion required to haul it up again. The operation of sounding in very deep water, with any considerable weight, occupies several hours, and a great number of men. That water is elastic has been proved by Canton's experiments as well as others: but there are familiar illustrations of this fact visible in ricochet shot, in 'ducks and drakes,' in the splashing of water, and in the rebounding of rain-drops from water. Being elastic, and the lower strata being under enormous pressure, it follows that those strata of water must be more dense than the body above them. No one doubts that the lower regions of the atmosphere are denser than the higher; yet air is but a rarer and much more elastic fluid than water. That which takes place in air, to a great extent, may be expected to occur in a very diminished degree with water. If it were not so, why should stones be blown up, casks violently burst, or rocks suddenly torn asunder by the application of the principle usually described as the hydrostatic paradox? If the water were not highly compressed before the explosion takes place, would there not be a gradual yielding, a tearing asunder by degrees, instead of a sudden and violent bursting?

The object of this digression is to show that although bodies which are not buoyant may sink to a considerable depth, it does not follow that they must sink to the bottom. Each separate thing may sink a certain distance, in proportion to its specific gravity, and there remain. The greatest depths ever reached by heavy weights, attached to lines, do not exceed a mile and a-half; a small distance, probably, compared with the depth of the diluvial flood.

Although metals, stone, rock, or coal may have sunk deeply in the waters, other substances, such as earth, mud, bones, animal and human remains, &c., may have



been held at various depths until decomposed by water; or combined and consolidated by volcanic gases, or electric currents. In this manner the preservation of delicate corallines, shells, skeletons of animals, &c., may be accounted for. Suspended in water, surrounded by earth in a dissolved state, combined by chemical agency, deposited on land, and consolidated by pressure, by volcanic or by latent heat, they may have become fossils. Thick skinned animals may have floated longest, because their hides would have buoyed them up for a greater length of time, hence their remains should be found near, or upon the surface of the ground, in some cases water-worn, in others uninjured, according as they had been strewn among shingle, or deposited in a yielding mass. That bones were not rolled about much among the stones in which they are found, is evident from the fact that bones, if so rolled among them, would soon be ground to powder. It is clear that, however much the bones may have been water-worn before deposition on land, both they, and the adjacent shingle, must have been deposited there nearly about the same time.

Tripoli stone, and other substances composed chiefly, if not entirely, of microscopic insects, may have been formed by the accumulation and cohesion of myriads of such minute creatures, swept together off the land, like swarms of locusts, aggregated by the rolling of the waves, agglutinated, deposited on the land, and afterwards heavily compressed. Or they may have been insects bred in water; such as those which Mr Darwin calculated to amount to 'one hundred thousand in a square inch of surface'; while the sea was streaked with them for a great distance. Microscopic objects such as these may have been killed by some gas rising from a volcano beneath; then drawn together by mutual attraction, rolled over and over, and landed among other recent compositions. In what other way could such a mass of these animalcules be heaped together?

There are also effects of existing causes which authors have only mentioned by name, in reference to the Deluge, without explaining that the effects alluded to would have been enormously increased at that time; — I mean the tides. In the Appendix to this volume is a short statement of the manner in which tides may act — upon the principles of the ocean oscillating in its bed; and of tides being caused, partly by the water being elevated by the moon and sun, partly by a westward momentum given to it by their attraction, and partly by the oscillation caused by the return of the fluid after being elevated. If this globe were covered with water to the height of a few miles above the present level of the ocean, three more particular effects would take place: an enormous pressure upon the previously existing ocean, and on all low land; a diminished gravity in the uppermost waters, resulting from their removal from the earth's centre; and immense tides, in consequence of the increased depth of the mass, the diminished weight of the upper fluid, and the augmentation of the moon's attraction. As the waters increased on the earth, the tides would also increase, and vast waves would rush against the sides of the mountains, stripping off all lighter covering, and blowing up, or tearing down, enormous masses of rock. Similar effects would take place as the diluvial ocean decreased, until it became bounded by its proper limits. Such oscillations I conceive to be alluded to by the words 'going and returning', and by



the expression, 'they go up by the mountains; they go down by the valleys'; which exactly describes the rushing of enormous waves against high land. When a wave strikes against a rock, it dashes up every projection that opposes it; but – its impetus at an end – down the water runs again through cavities and hollows: such, on a grand scale, would be the effect of a diluvial wave urged against a mountain side.

In such a war of waters, earth, and fire; a buoyant, closed-in vessel – without masts, rudder, or external 'hamper' to hold wind, or catch a sea – might have floated uninjured; and the fewer openings, of any description, in her cover, or sides, the better for her security. Seeing nothing of the conflict around might have diminished the excessive terror which must have been felt by those that were within, except the confiding Chief. We do not find that the largest or highest 'swell' injures a good 'sea-boat,' when in deep water, and far from land: the foaming 'breakers' alone destroy. But, after all, such conjectures as these are vain, we cannot now know how far miraculous interposition extended – how far secondary causes were employed.

The landing of the ark on a mountain of middle height appears remarkable; because the climate of the highest, on which we might naturally suppose the ark rested, did we not know to the contrary, might have been insupportable during the time that Noah waited for the recess of the waters.<sup>1</sup> Reasoning from existing circumstances, the temperature of the surface of the ocean would have been nearly that of the contiguous air: but after the waters had receded, high mountain tops would have gradually acquired their present frozen state.

Here the reflection arises – when did icebergs begin to appear? Was not the climate equable and temperate all over the world for some time after the Deluge, in consequence of the slow drying and warming of tropical regions, and gradual formation of ice near the poles? Such a condition of climate would have favoured the distribution of animals. Those who oppose the idea that animals migrated to various quarters of the globe, surely do not reflect that the swallow, the wild swan, the wild goose, the wild horse, the Norway rat, and numerous other creatures, now migrate periodically in search of food or a better climate. Similar instinct may have taught animals to wander then, till they reached the places suited to them;<sup>2</sup> and there the same instinct would retain them. Want of proper food, or climate; or the attacks of enemies, may have destroyed stragglers who did not migrate; therefore, when we find no kangaroos in Europe, it is no proof that kangaroos did not once exist there. Elks are now found in North America – we know they were formerly in Europe – is that race here now? During the first few hundred years after the flood, extraordinary changes may have taken place in the geography of the world, in consequence of the drying and altering of various

<sup>1</sup>The Deluge began in the six hundredth year of Noah's life, in the second month, and seventeenth day of the month (Gen. vii. 11),; and Noah quitted the ark in the six hundred and first year, in the second month, and twenty-seventh day of the month (Gen. viii. 14), making a period of twelve months and ten days. Noah waited in the ark nearly five months after it grounded on Ararat.

<sup>2</sup>We see abundant evidence that either living creatures are adapted to particular climates and localities, or that climates and localities are adapted to particular creatures; which latter, it has been proved by many authors, are altered by any material change of the former.



portions; also from the effects of volcanic eruptions and earthquakes, occasioned perhaps by electric action on newly-exposed land, as well as by other causes. Many places, now islands, may have been united to a continent for a considerable period after the deluge; much land may have sunk down, much may have risen up, in various parts of the world. Such changes are said to be going on even now, though on a small scale (Lyell, Darwin, &c.); what may they not have been during the first few centuries after the flood? Volcanic eruptions, such as those of the Galapagos, Andes, Etna, Auvergne, Indian Islands, &c., were then perhaps in such activity as they have never shown since.

What the division in the earth was, in the days of Peleg, does not distinctly appear: but it could only have been a separation from the true faith; a partition of territory among men; or some mighty convulsion, some rending or contraction, as it were, of the earth, which was so general as to have occasioned a marked and unqualified record, as of an event well known to all.

Many philosophers think that the world has a central region of surpassing heat, and that the greater part of the interior of the globe is in a state of incandescence, if not of fusion. That small portion which they call the crust of the earth is supposed to be the only cooled part; and they differ merely as to the degree of fluidity in the central region. I take it for granted that they have duly estimated the moon's tendency to cause tides in a fluid mass, within her influence: if there were no crust, of course she would cause such an effect, but a well hardened case, we must suppose, can resist any such movement in the central fluid mass. Upon the principle of the arch, it would be easier to imagine resistance to pressure from without than from within; but the case or crust of our globe must be so solid that it neither yields nor vibrates to an internal expansive force.

This theory, however, is unsupported by any satisfactory evidence. Men of character and attainments have advocated it, although resting on conjecture: but when we look back along the roll of history, and discover so few philosophers who have not greatly erred, although famed in their day, it is natural to pause, and not acquiesce hastily in mere human assertion unsubstantiated by proof. Boring the ground, or examining the temperature of the bottom of a deep mine, affords no estimate for that of the central regions: Sir John Herschel says, that 'the deepest mine existing does not penetrate half a mile below the surface; a scratch or pinhole duly representing it on the surface of such a globe (sixteen inches in diameter), would be imperceptible without a magnifier'. As our globe is about eight thousand miles in diameter, and external influence may be supposed to penetrate some distance, we can draw but unsatisfactory conclusions from experiments at depths not nearly so great even as that to which the ocean descends, and made chiefly in temperate or cold climates.

Having no pretension to more knowledge than any observant seaman may acquire in the course of a few years active employment afloat, it would be as vain as presumptuous in me, were I to offer any conjecture about the central mass of the earth. Perhaps, at a future day, when the nature of aerolites; the agency of electricity; and of electric communication through the superficial, if not through the interior regions of the globe, are better known, other opinions, respecting this



wonderful world which we inhabit, may be formed by philosophers.

I have now fulfilled my intention of endeavouring to be useful, in however small a degree, to young persons of my own profession. If the few remarks laid before them, in this and the preceding chapter, at all increase their interest in the subjects spoken of; and tend, even in the least, to warn them against assenting hastily to new theories – while they induce a closer examination into the Record of truth – my object in writing them will be fully attained.

*Narrative 2* pp.657–82

Darwin retained a more open mind; but he was not ungrateful to the Captain.

Our voyage having come to an end, I will take a short retrospect of the advantages & disadvantages, the pains & pleasures, of our five years' wandering. If a person should ask my advice before undertaking a long voyage, my answer would depend upon his possessing a decided taste for some branch of knowledge which could by such means be acquired. No doubt it is a high satisfaction to behold various countries, & the many races of Mankind, but the pleasures gained at the time do not counterbalance the evils. It is necessary to look forward to a harvest however distant it may be, when some fruit will be reaped, some good effected. Many of the losses which must be experienced are obvious; such as that of the society of all old friends, & of the sight of those places, with which every dearest remembrance is so intimately connected. These losses, however, are at the time partly relieved by the exhaustless delight of anticipating the long-wished for day of return. If, as poets say, life is a dream, I am sure in a long voyage these are the visions which best pass away the long night. Other losses, although not at first felt, after a period tell heavily; these are the want of room, of seclusion, of rest; the jading feeling of constant hurry; the privation of small luxuries, the comforts of civilization, domestic society, & lastly even of music & the other pleasures of imagination. When such trifles are mentioned, it is evident that the real grievances (excepting from accidents) of a sea life are at an end. The short space of sixty years has made a most astonishing difference in the facility of distant navigation. Even in the time of Cook, a man who left his comfortable fireside for such expeditions, did undergo privations: a yacht with every luxury of life might now circumnavigate the globe. Besides the vast improvements in ships & naval resources, the whole Western shores of America are thrown open; & Australia is become a metropolis of a rising continent. How different are the circumstances to a man shipwrecked at the present day in the Pacific, to what they would have been in the time of Cook; since his voyage a hemisphere has been added to the civilized world.

If a person suffer much from sea sickness, let him weigh it heavily in the balance: I speak from experience, it is no trifling evil cured in a week as most people suppose. (I speak from experience, as well I may, suffering now more than I did three years ago. *del.*) If he takes pleasure in naval tactics, it will afford him full scope for his taste; but even the greater number of sailors, as it appears to me, have little real liking for the sea itself; (if not compelled to it by necessity, visions



of glory when very young & the force of habit when old, are the sole bonds of attraction, *del.*) It must be borne in mind how large a proportion of the time during a long voyage, is spent on the water, as compared to the days in harbour. (In our five years, the excess of days during the whole of which the anchor has been down, over the remainder, has scarcely equalled fifty. *del.*) And what are the boasted glories of the illimitable ocean? A tedious waste, a desert of water, as the Arabian calls it. No doubt there are some delightful scenes; a moonlight night, with the clear heavens, the dark glittering sea, the white sails filled by the soft air of a gently blowing trade wind; a dead calm, the heaving surface polished like a mirror, & all quite still excepting the occasional flapping of the sails. It is well once to behold a squall, with its rising arch, & coming fury, or the heavy gale & mountainous waves. I confess, however, my imagination had painted something more grand, more terrific in the full grown storm. It is a finer sight on the canvass of Vandervelde, & infinitely finer when beheld on shore, where the waving trees, the wild flight of the birds, the dark shadows & bright lights, the rushing torrents, all proclaim the strife of the unloosed elements. At sea, the albatross & petrel fly as if the storm was their proper sphere, the water rises & sinks as if performing its usual task, the ship alone & its inhabitants seem the object of wrath. On a forlorn & weather-beaten coast, the scene is indeed different, but the feelings partake more of horror than of wild delight.

Let us now look at the brighter side of the past time. The pleasure derived from beholding the scenery & general aspect of the various countries we have visited, has decidedly been the most constant & highest source of enjoyment. It is probable that the picturesque beauty of many parts of Europe far exceeds anything we have beheld. But there is a growing pleasure in comparing the character of scenery in different countries, which to a certain degree is distinct from merely admiring their beauty. It more depends on an acquaintance with the individual parts of each view: I am strongly induced to believe that, as in Music, the person who understands every note, will, if he also has true taste, more thoroughly enjoy the whole; so he who examines each part of a fine view, may also thoroughly comprehend the full & combined effect. Hence a traveller should be a botanist, for in all views plants form the chief embellishment. Group masses of naked rocks, even in the wildest forms, for a time they may afford a sublime spectacle, but they will soon grow monotonous; paint them with bright & varied colours, they will become fantastick; clothe them with vegetation, they must form at least a decent, if not a most beautiful picture.

When I said that the scenery of Europe was probably superior to anything which we have beheld, I must except, as a class by itself, that of the intertropical regions. The two cannot be compared together; but I have already too often enlarged on the grandeur of these latter climates. As the force of impression frequently depends upon preconceived ideas, I may add that all mine were taken from the vivid descriptions in the Personal Narrative which far exceed in merit anything I have ever read on the subject. Yet with these high wrought ideas, my feelings were very remote from partaking of a tinge of disappointment on first landing on the coast of Brazil.



Amongst the scenes which are deeply impressed on my mind, none exceed in sublimity the primeval forests, undefaced by the hand of man, whether those of Brazil, where the powers of life are predominant, or those of Tierra del Fuego, where death & decay prevail. Both are temples filled with the varied productions of the God of Nature. No one can stand unmoved in these solitudes, without feeling that there is more in man than the mere breath of his body. In calling up images of the past, I find the plains of Patagonia most frequently cross before my eyes. Yet these plains are pronounced by all most wretched & useless. They are only characterized by negative possessions; without habitations, without water, without trees, without mountains, they support merely a few dwarf plants. Why then, & the case is not peculiar to myself, do these arid wastes take so firm possession of the memory? Why have not the still more level, green & fertile Pampas, which are serviceable to mankind, produced an equal impression? I can scarcely analyse these feelings; but it must be partly owing to the free scope given to the imagination. They are boundless, for they are scarcely practicable, & hence unknown: they bear the stamp of having thus lasted for ages, & there appears no limit to their duration through future time. If, as the ancients supposed, the flat earth was surrounded by an impassable breadth of water, or by deserts heated to an intolerable excess, who would not look at these last boundaries to man's knowledge with deep, but ill defined sensations.

Lastly, of natural scenery, the views from lofty mountains, though certainly in one sense not beautiful, are very memorable. I remember looking down from the crest of the highest Cordillera; the mind, undisturbed by minute details, was filled by the stupendous dimensions of the surrounding masses.

Of individual objects, perhaps no one is more sure to create astonishment, than the first sight in his native haunt, of a real barbarian – of man in his lowest & most savage state. One's mind hurries back over past centuries, & then asks, could our progenitors be such as these? Men, whose very signs & expressions are less intelligible to us than those of the domesticated animals; who do not possess the instinct of those animals, nor yet appear to boast of human reason, or at least of arts consequent on that reason. I do not believe it is possible to describe or paint the difference of savage & civilized man. It is the difference between a wild & tame animal: & part of the interest in beholding a savage is the same which would lead every one to desire to see the lion in his desert, the tiger tearing his prey in the jungle, the rhinoceros on the wide plain, or the hippopotamus wallowing in the mud of some African river.

Amongst the other most remarkable spectacles which we have beheld, may be ranked – the stars of the Southern hemisphere – the water-spout – the glacier leading its blue stream of ice in a bold precipice overhanging the sea – a lagoon island, raised by the coral forming animalcule – an active volcano – the overwhelming effects of a violent earthquake. These latter phenomena perhaps possess for me a higher interest, from their intimate connection with the geological structure of the world. The earthquake must, however, be to everyone a most impressive event; the solid earth, considered from our earliest childhood as the very type of solidity, has oscillated like a thin crust beneath our feet; & in



seeing the most beautiful & laboured works of man in a moment overthrown, we feel the insignificance of his boasted power.

It has been said that the love of the chase is an inherent delight in man – a relic of an instinctive passion: if so, I am sure the pleasure of living in the open air, with the sky for a roof, and the ground for a table, is part of the same feeling. It is the savage returning to his wild & native habits. I always look back to our boat cruizes & my land journeys, when through unfrequented countries, with a kind of extreme delight, which no scenes of civilization could create. I do not doubt every traveller must remember the glowing sense of happiness, from the simple consciousness of breathing in a foreign clime, where the civilized man has seldom or never trod.

There are several other sources of enjoyment in a long voyage, which are perhaps of a more reasonable nature. The map of the world ceases to be a blank; it becomes a picture full of the most varied & animated figures. Each part assumes its true dimensions: large continents are not looked at in the light of islands, or islands considered as mere specks, which in truth are larger than many kingdoms of Europe. Africa, or North & South America, are well-sounding names & easily pronounced, but it is not till having sailed for some weeks along small portions of their coasts, that one is thoroughly convinced, how large a piece of our immense world these names imply.

From seeing the present state, it is impossible not to look forward with high expectation to the future progress of nearly an entire hemisphere. The march of improvement, consequent on the introduction of Christianity, through the South Sea, probably stands by itself on the records of the world. It is the more striking when we remember that but sixty years since, Cook, whose most excellent judgment none will dispute, could foresee no prospect of such change. Yet these changes have now been effected by the philanthropic spirit of the English nation.

In the same quarter of the globe, Australia is rising, or indeed may be said to have risen, into a grand centre of civilization which at some not very remote period, will rule the empress of the Southern hemisphere. It is impossible for an Englishman to behold these distant colonies, without a high pride & satisfaction. To hoist the British flag seems to draw as a certain consequence, wealth, prosperity & civilization.

In conclusion, it appears to me that nothing can be more improving to a young naturalist, than a journey in distant countries. It both sharpens & partly also allays that want & craving, which as Sir J. Herschel remarks, a man experiences although every corporeal sense is fully satisfied. The excitement from the novelty of objects, & the chance of success, stimulates him on to activity. Moreover, as a number of isolated facts soon become uninteresting, the habit of comparison leads to generalization; on the other hand, as the traveller stays but a short space of time in each place, his description must generally consist of mere sketches, instead of detailed observation. Hence arises, as I have found to my cost, a constant tendency to fill up the wide gaps of knowledge by inaccurate & superficial hypotheses.

But I have too deeply enjoyed the voyage not to recommend to any naturalist to



take all chances, & to start on travels by land if possible, if otherwise, on a long voyage. He may feel assured he will meet with no difficulties or dangers (excepting in rare cases) nearly so bad, as he before hand imagined. In a moral point of view, the effect ought to be to teach him good humoured patience, unselfishness, the habit of acting for himself, & of making the best of everything, or contentment: in short, he should partake of the characteristic qualities of the greater number of sailors. Travelling ought also to teach him to distrust others; but at the same time he will discover how many truly goodnatured people there are, with whom he never before had, nor ever again will have any further communication, yet who are ready to offer him the most disinterested assistance.

*Diary* pp. 425-30

C. D. TO R. F.

Shrewsbury, Thursday morning, October 6 [1836].

My dear Fitz-Roy,

I arrived here yesterday morning at breakfast-time, and, thank God, found all my dear good sisters and father quite well. My father appears more cheerful and very little older than when I left. My sisters assure me I do not look the least different, and I am able to return the compliment. Indeed, all England appears changed excepting the good old town of Shrewsbury and its inhabitants, which, for all I can see to the contrary, may go on as they now are to Doomsday. I wish with all my heart I was writing to you amongst your friends instead of at that horrid Plymouth. But the day will soon come, and you will be as happy as I now am. I do assure you I am a very great man at home; the five years' voyage has certainly raised me a hundred per cent. I fear such greatness must experience a fall.

I am thoroughly ashamed of myself in what a dead-and-half-alive state I spent the few last days on board; my only excuse is that certainly I was not quite well. The first day in the mail tired me, but as I drew nearer to Shrewsbury everything looked more beautiful and cheerful. In passing Gloucestershire and Worcestershire I wished much for you to admire the fields, woods, and orchards. The stupid people on the coach did not seem to think the fields one bit greener than usual; but I am sure we should have thoroughly agreed that the wide world does not contain so happy a prospect as the rich cultivated land of England.

I hope you will not forget to send me a note telling me how you go on. I do indeed hope all your vexations and trouble with respect to our voyage, which we now know HAS an end, have come to a close. If you do not receive much satisfaction for all the mental and bodily energy you have expended in His Majesty's service, you will be most hardly treated. I put my radical sisters into an uproar at some of the prudent (if they were not honest Whigs, I would say shabby) proceedings of our Government. By the way, I must tell you for the honour and glory of the family that my father has a large engraving of King George IV put up in his sitting-room. But I am no renegade, and by the time we meet my politics will be as firmly fixed and as wisely founded as ever they were.

I thought when I began this letter I would convince you what a steady and sober frame of mind I was in. But I find I am writing most precious nonsense.



Two or three of our labourers yesterday immediately set to work, and got most excessively drunk in honour of the arrival of Master Charles. Who then shall gainsay if Master Charles himself chooses to make himself a fool. Good-bye. God bless you! I hope you are as happy, but much wiser, than your most sincere but unworthy philosopher,

Chas Darwin.

*Letters* 1 pp.269-71







# Conrad Martens's 'Beagle' Pictures

## KEY TO PRESENT OWNERSHIP OF LISTED PICTURES

ABM	Armando Braun Menendez
BM	Department of Prints and Drawings, British Museum, London, WC1B 3DG
CUL	University Library, Cambridge, CB3 9DR
DLib	Dixson Library, State Library of New South Wales, Sydney, NSW 2000
GPD	George Darwin
MHMM	Museo Historico Municipal, Cabildo de Montevideo, Uruguay
MLib	Mitchell Library, State Library of New South Wales, Sydney, NSW 2000
MS	Mark Smyth
NGV	National Gallery of Victoria, Melbourne 3004
NLA	Rex Nan Kivell Collection, National Library of Australia, Canberra, ACT 2600
NMM	National Maritime Museum, London SE10 9NF
Q GK	Quentin Keynes
RAML	Mrs Rosemary Longworth
RDK	Richard Keynes
RGB	Mrs R. G. Barnet
RJK	Roger Keynes
RNA	Royal Naval Archives, Hydrographic Department, Taunton, Somerset TA1 2DN
RQMS	R. Q. Macarthur Stanham
SDK	Simon Keynes
WRGH	Mrs W. R. G. Hiscock

## ON THE WAY TO MONTEVIDEO

- 1 *First appearance of the Island of Porto Santo. May 29 1833. Drawing. RQMS Sketchbook II f.7.*
- 2 *East end of the Island of Porto Santo. May 29 1833. Watercolour. RQMS Sketchbook II f.35.*
- 3 *East end of Madeira. May 29 1833. Watercolour. RQMS Sketchbook II f.9.*
- 4 *East end of Madeira. n.d. Drawing. RQMS Sketchbook II f.8 verso.*
- 5 *The Brazen Head, Madeira. n.d. Watercolour. RQMS Sketchbook II f.34.*



- 6 *At Madeira. Sent to my friend in England by Parry, Nov/33. May 30 1833. Drawing. RQMS Sketchbook II f.13.*
- 7 *At Madeira. May 30 1833. Drawing. RQMS Sketchbook II f.14.*
- 8 *At Madeira. May 30 1833. Drawing. RQMS Sketchbook II f.15.*
- 9 *The Long Rock, Funchal. May 30, 1833. Drawing. RQMS Sketchbook II f.10.*
- 10 *Funchal, Madeira. n.d. Watercolour from viewpoint similar to No. 9. MLib, SSV\*/Spec. Coll./Martens/22.*
- 11 *The Corrale, Madeira. May 31 1833. Drawing. RQMS Sketchbook II f.16.*
- 12 *The Corral. May 31. Drawing. RQMS Sketchbook II f.17.*
- 13 *View in the Corral, Madeira. n.d. Drawing. RQMS Sketchbook II f.18.*
- 14 *The Corral. May 31. Drawing. RQMS Sketchbook II f.19.*
- 15 *The Corral. May 31 1833. Drawing. RQMS Sketchbook II f.20.*
- 16 *View at the bottom of the Coralle, Madeira. May 31 1833. Drawing. RQMS Sketchbook II f.21.*
- 17 *Bridge at the bottom of the Coralle. May 31. Drawing. RQMS Sketchbook II f.22.*
- 18 *The Banana at Madeira. n.d. Drawing. RQMS Sketchbook II f.12.*
- 19 *by Capt Blackwood. May 31 1833. Drawing, apparently in another hand, of the same scene as No. 17. RQMS Sketchbook II f.24 verso.*
- 20 *Funchal. Sent to my mother by the hand of Mr H, July/33. June 1. Drawing. RQMS Sketchbook II f.23.*
- 21 *Near Funchal. Seat of J. Phelps Esq. June 1 1833. Drawing. RQMS Sketchbook II f.26.*
- 22 *Port of Funchal from the anchorage. June 2 1833. Drawing. RQMS Sketchbook II f.11.*
- 23 *The house of the British Consul at Funchal, Madeira. June 2. Drawing. RQMS l.d.10.*
- 24 *Part of Ferro, one of the Canaries. June 4 1833. Watercolour. SDK.*
- 25 *One of the Canaries. June 4 1833. Watercolour. QGK.*
- 26 *Teneriffe. June 4 1833. Watercolour. RAML.*
- 27 *The Island of Fogo bearing WNW, one of the Verds, a Volcano still in action. Evening. June 9 1833. Watercolour. RQMS Sketchbook II f.6 verso.*
- 28 *Part of St Jago, one of the Verds. June 9 1833. Drawing. RQMS Sketchbook II f.7 verso.*
- 29 *Part of St Jago, one of the Verd Islands. June 9 1833. Watercolour. RQMS Sketchbook II f.9 verso.*
- 30 *St Jago, one of the Verds, bearing E by N distant 6 miles. 9 June 1833. Watercolour. RDK.*
- 31 *Fernando de Noronha, coast of Brasil. n.d. Drawing. RQMS l.d.15.*
- 32 *On the coast near Rio Janeiro. July 5 1833. Watercolour. RQMS Sketchbook II f.27.*
- 33 *Sugar Loaf and Corcovado. n.d. Watercolour. RQMS Sketchbook II f.28.*
- 34 *Entrance to the Harbour of Rio Janeiro. July 5 1833. Watercolour. RQMS l.d.6.*
- 35 *The Gavea, Rio Janeiro. July 5 - 33. Watercolour. RQMS l.d.7.*
- 36 *Entrance to the Harbour of Rio Janeiro. July 5 1833. Watercolour. RQMS Sketchbook IV f.2.*
- 37 *View in Rio Harbour. July 6 1833. Drawing. RQMS Sketchbook II f.24.*
- 38 *View in Rio Harbour. July 7. Watercolour. RQMS Sketchbook IV f.3.*
- 39 *View in Rio Harbour with the Corcovado. July 7 1833. Drawing. RQMS Sketchbook IV f.4.*
- 40 *The Spartiate 74 R.A. Sir H. Seymour. July 10 1833. Watercolour. RQMS Sketchbook IV f.5.*
- 41 *View in Rio Harbour from Villogagnon. Sent to my friend in England by Parry, Nov/33. July 11 1833. Drawing. CUL Sketchbook III (ADD. MS 7983) f.2.*
- 42 *Botofogo Bay, Rio Janeiro. July 15 1833. Drawing. CUL Sketchbook III (ADD. MS 7983) f.3.*



## CONRAD MARTENS'S 'BEAGLE' PICTURES

- 43 Botofogo Bay, Rio de Janeiro. n.d. Watercolour development of No. 42. MLib, SSV\*/Spec. Coll/Martens/21.
- 44 *Corcovado*. July 15 1833. Drawing. CUL Sketchbook III (ADD. MS 7983) f.4.
- 45 Unidentified church in Rio de Janeiro. July 17 1833. Drawing. RQMS Sketchbook IV f.6.
- 46 *Sugar loaf*. At Rio Janeiro. n.d. Drawing. CUL Sketchbook III (ADD. MS 7983) f.5.
- 47 *Islands off Rio Harbour*. [*Ilha Redonda and Ilha Rasa, with Pedra de Gavea behind.*] July 18 1833. Watercolour. CUL Sketchbook III (ADD. MS 7983) f.6.
- 48 *Indus* [a ship], passage from Rio Janeiro to Monte Video. July 19/33. CUL Sketchbook III (ADD. MS 7983) f.7.
- 49 Stern view of *Indus*. n.d. Drawing. And birds on water. n.d. Watercolour. CUL Sketchbook III (ADD. MS 7983) f.8.

## MONTEVIDEO

- 50 *Monte Video*. August 3 1833. Double page panorama drawing. CUL Sketchbook III (ADD. MS 7983) f.8 verso and f.9.
- 51 *Monte Video* [from a distance], for Mrs Stewart. August 26 1833. Drawing. CUL Sketchbook III (ADD. MS 7983) f.11.
- 52 *Monte Video* [street scene], sent to Mr Hd. by Parry in Novr/33. Drawing. CUL Sketchbook III (ADD. MS 7983) f.10.
- 53 Montevideo, 25 de Agosto Street and the house of the Ximenez and Bóvedas after the explosion. n.d. Watercolour. MHMM, ex-col. Octavio C. Assunção.
- 54 *El Aguada*, near Monte Video. August 27 1833. Drawing. CUL Sketchbook III (ADD. MS 7983) f.12.
- 55 *El Aguada*, near Monte Video [from a greater distance]. August 27 1833. Drawing. CUL Sketchbook III (ADD. MS 7983) f.13.
- 56 *Monte Video*. Sent to Mr H. by Parry, Nov/33. August 28 1833. Drawing. CUL Sketchbook III (ADD. MS 7983) f.14.
- 57 *Monte Video from the South*. n.d. Chalk and watercolour development of No. 56. BM, L.B.34.
- 58 Montevideo. n.d. Watercolour variant of No. 56. Engraved by T. Landseer in *Narrative* 1, facing p.1. MS.
- 59 Birds on the shore. n.d. Watercolour. CUL Sketchbook III (ADD. MS 7983) f.15.
- 60 Unidentified scene. n.d. Drawing. CUL Sketchbook III (ADD. MS 7983) f.15 verso.
- 61 *Monte Video, near the English Gate*. Sent to my friend in England by Parry, Nov/33. August 28 1833. Drawing. CUL Sketchbook III (ADD. MS 7983) f.16 verso.
- 62 Montevideo Street with Matriz Church in the background. n.d. Watercolour variant of No. 61. MHMM, ex-col. Octavio C. Assunção.
- 63 *Milk boy* [on horseback]. n.d. Watercolour. And ship at anchor. Drawing. CUL Sketchbook III (ADD. MS 7983) f.17.
- 64 Outer wall of Montevideo. August 28 1833. Drawing. CUL Sketchbook III (ADD. MS 7983) f.17 verso.
- 65 Scene outside Montevideo. August 28 1833. Drawing. CUL Sketchbook III (Add. MS 7983) f.18 verso.
- 66 Unidentified scene. n.d. Watercolour. CUL Sketchbook III (ADD. MS 7983) f.19.
- 67 Jaguar lying on a cage. n.d. Drawing. CUL Sketchbook III (ADD. MS 7983) f.20.
- 68 *Gaúcho* [and horses]. n.d. Drawing. CUL Sketchbook III (ADD. MS 7983) f.21.



- 69 Rural scene. n.d. Watercolour variant of No. 68. MHMM, ex-col. Octavio C. Assunção.
- 70 Picnic opposite Montevideo. *Novr 13 1833*. Watercolour. MHMM, ex-col. Octavio C. Assunção.
- 71 Ladies in the milking parlour. n.d. Watercolour. MHMM, ex-col. Octavio C. Assunção.
- 72 *Montevideo from the anchorage of H. M. S. Beagle. Decr 4 1833*. Double page panorama drawing in ink and sepia wash. CUL Sketchbook III (ADD. MS 7983) f.21 verso and f.22.
- 73 Montevideo harbour from the south-east. n.d. Watercolour variant of left side of No. 72. NMM, PR 73-41 (2).
- 74 Montevideo harbour from the north-west. n.d. Watercolour variant of right side of No. 72. NMM, PR 73-41 (3).

### PORT DESIRE

- 75 *The Adventure off Port Desire. Decr 23 1833*. Watercolour. MS.
- 76 *Ruins, North side of the Harbour of Port Desire. Decr 23 1833*. Initialled top right: RF. Watercolour. CUL Sketchbook III (ADD. MS 7983) f.23.
- 77 *The Weke* [?], *Port Desire. Decr 24 1833*. Drawing. CUL Sketchbook III (ADD. MS 7983) f.24.
- 78 *Port Desire. Christmas Day 1833*. Ships at anchor labelled 'Adelaide' and 'Beagle' in another hand. Drawing. RQMS Sketchbook IV f.7.
- 79 Anchorage, and Spanish ruins, Port Desire. n.d. Watercolour development of No. 78. Engraved by S. Bull in *Narrative 2*, facing p.316. MS.
- 80 *Slinging the monkey, Port Desire, Decr 25 1833*. Note *Mainmast of the Beagle a little farthur aft, Miz. Mast to rake more*. Initialled top right: RF. Watercolour. CUL Sketchbook III (ADD. MS 7983) f.27.
- 81 *Guanacoe Island, Port Desire. Decr 26 1833*. Watercolour. CUL Sketchbook III (ADD. MS 7983) f.25.
- 82 *Wood Island, Port Desire 7 miles. Decr 26, 33*. Watercolour. CUL Sketchbook III (ADD. MS 7983) f.27 verso.
- 83 *Glen at Port Desire. Decr 28*. Watercolour. CUL Sketchbook III (ADD. MS 7983) f.26.
- 84 *Port Desire, coast of Patagonia, looking up [the inlet]. Decr 1833*. Watercolour. CUL Sketchbook III (ADD. MS 7983) f.28.
- 85 *The course of the river – looking down 21 miles from the mouth. Davis* [?] *Decr 1833*. Watercolour. Engraved by S. Bull as 'Upper part of Port Desire inlet' in *Narrative 2*, facing p.316. MS.
- 86 Unidentified scene similar to No. 85. n.d. Drawing. CUL Sketchbook III (ADD. MS 7983) f.29.
- 87 *The Bivouack. Decr 29*. Watercolour with unfinished section on left side. Engraved by S. Bull as 'Bivouac at the head of Port Desire inlet' in *Narrative 2*, facing p.316. MS.
- 88 Bivouac at Port Desire. n.d. Watercolour, variant of No. 87. MS.
- 89 Britannia Rock from a distance. n.d. Watercolour. Engraved by S. Bull as 'Britannia or Tower Rock, Port Desire' in *Narrative 2*, facing p.316. MS.
- 90 Britannia Rock from nearby. n.d. Watercolour. MS.
- 91 Rough sketch of small boat with sail set. n.d. Drawing. CUL Sketchbook III (ADD. MS 7983) f.29 verso.



## CONRAD MARTENS'S 'BEAGLE' PICTURES

## PORT ST JULIAN

- 92 *Entrance to Port St Julian. Jan 9 1834.* Initialled top right: RF. Watercolour. Engraved by S. Bull under erroneous title 'Entrance to Berkeley Sound' in *Narrative 2*, facing p.248. RDK.

## STRAIT OF MAGELLAN

- 93 *Mount Aymond. Jany 27 1834.* Initialled top left: HO. Watercolour. cf. RNA, C.M. No. VIII. RJK.
- 94 *[Patagonians at] Gregory Bay. Mem. To get an outline of that in the possession of Capt F. The Toldos were all in one line, and there were more horses, some picqueted and many with their riders.* n.d. Watercolour. ABM.
- 95 *The Adventure.* n.d. Drawing on verso of No. 94. Incorporated in engraving by T. Landseer entitled 'Mount Sarmiento (from Warp Bay)' in *Narrative 2*, facing p.359. ABM.
- 96 *Patagonians (at Gregory Bay).* n.d. Watercolour, variant of No. 94. Engraved by T. Landseer in *Narrative 2*, facing p.136. MS.
- 97 *Patagonian Indians, Gregory Bay. Jany 29, 1834.* Watercolour. CUL Sketchbook III (ADD. MS 7983) f.31.
- 98 *Caryophyllia sp. [plant]. Elizabeth Island, Straits of Magellan. Jany 30 1834.* Watercolour. CUL Sketchbook I (ADD. MS 7984) f.2.
- 99 *Port Famine [showing on left] Lomas Range the highest 2963, [on right] Mount Tarn 2700. Feby 4 1834.* Beneath on right: *Port Famine. So called by Cavendish 1594, who discovered only 3 survivors of the many hundreds of Colonists who embarked under Philip II of Spain to found a Colony there – about 1580. On left: Capt Stokes, Second in command of the British Expedition, committed suicide here 1826 in consequence of having contended for 4 months against storm & currents in the Straits of Magellan endeavouring to make passage through.* Double page panorama watercolour. RQMS Sketchbook IV f.7 verso and f.8 recto.
- 100 *Mount St Felipe – Port Famine. Feby 5 1834.* Watercolour. MS.
- 101 *Port Famine and Mount Tarn. Feby 5.* Watercolour. RQMS Sketchbook IV f.9.
- 102 *Port Famine. Feby 6 1834.* Watercolour. RQMS Sketchbook II f.25.
- 103 *Mount Tarn from the opposite side of Port Famine. Feby 6 1834.* CUL Sketchbook III (ADD. MS 7983) f.32.
- 104 *Mount Sarmiento as seen from Port Famine by telescope, distant 49 miles. Feby 7 1834.* Initialled top right: RF. Watercolour. CUL Sketchbook III (ADD. MS 7983) f.30.
- 105 *Near Port Famine. Feby 7 1834.* Drawing. RDK.
- 106 *Near Port Famine, Mount Buckland 4000, bearing from Rocky point S.46E. Feby 7 1834.* Drawing. RDK.
- 107 *Mnt Sarmiento 6800. Lomas Range, the highest 2963.* n.d. Watercolour. CUL Sketchbook III (ADD. MS 7983) f.32 verso.
- 108 *Sedger River, Port Famine. Feby 8th 1834.* Also *Port Famine [with 'Beagle' at anchor].* n.d. Also unidentified scene. n.d. Watercolours. RQMS Sketchbook IV f.1.
- 109 *Sedger River, Port Famine. On back: Feby 8/34.* Watercolour. RQMS Sketchbook IV f.10.



## TIERRA DEL FUEGO

- 110 Silhouette of Staten Island in two sections. *Cape St John* [at right-hand end]. n.d. Initialled top right: HO. Drawing, cf. RNA C.M. No. XVIII. RQMS Sketchbook IV f.11.
- 111 *Part of Staten Land. Feby 22 1834.* Drawing. RQMS Sketchbook IV f.11 verso.
- 112 *Distant view of Cape Horn. Feby 24 1834. The Barnevelts.* Initialled top right: H.O. Also *Cape Horn.* Initialled bottom right: HO. Also *Wollaston Island.* Also *Evouts Island.* Initialled middle right: HO. Watercolours, cf. RNA C.M. No. XIX and engravings by S. Bull in *Narrative 1*, facing p.407. RQMS Sketchbook IV f.12.
- 113 *Wollaston Island. Feby 24 1834.* Two drawings with copious notes of colours. RQMS Sketchbook IV f.13.
- 114 Fuegians in a canoe off Wollaston Island. n.d. Watercolour with graphite and gum arabic heightening, developed from Nos. 113 and 115. Engraved by S. Bull as 'North-east side of Wollaston Island near Cape Horn' in *Narrative 1*, facing p.433. NMM, PR 73-41 (4).
- 115 *Fuegians alongside the ship.* n.d. Pencil and ink drawing. RQMS l.d.14.
- 116 *Part of Wollaston Island. Feby 25 1834.* Initialled top right: RF. Drawing. RQMS Sketchbook IV f.14.
- 117 *Part of Wollaston Island, Terra del. Feby 25 1834.* Watercolour development of No. 116. RQMS l.d.17, formerly pasted on f.13 verso of Sketchbook IV.
- 118 *Beagle Channel, [on left] Rees Point. Feby 28.* Drawing. RQMS Sketchbook IV f.14 verso.
- 119 *Entrance to the Beagle Channel. Feby 28 1834.* Drawing. RQMS Sketchbook IV f.15.
- 120 *Fuegians. Feby 1834.* Drawing. RQMS l.d.12.
- 121 *Beagle Channel. March 1st 1834.* Initialled top right: RF. Drawing. RQMS Sketchbook IV f.15 verso.
- 122 Fuegians and the *Beagle* at Portrait Cove. n.d. Watercolour with graphite heightening developed from No. 121. Engraved by T. Landseer as 'Portrait Cove in Beagle Channel' in *Narrative 2*, facing p.326. NMM, PR 73-41 (7).
- 123 *Calm sunny morning, Beagle Channel. March 1 1834.* Initialled top right: RF. Drawing. RQMS Sketchbook IV f.16.
- 124 Fuegians with two canoes in the Beagle Channel. n.d. Watercolour development of No. 123. MS.
- 125 Two Fuegians fishing from a canoe. n.d. Pencil and ink drawing. RQMS l.d.13.
- 126 Fuegians spearing fish at water's edge. n.d. Pencil and wash drawing. RQMS l.d.16.
- 127 Fuegians on rocks and in canoes. n.d. Pencil and ink drawing. RQMS l.d.2.
- 128 *[Fuegian] carrying bag of coals [?] for lighting the fire.* n.d. Drawing. RQMS l.d.8.
- 129 *A family group. Entrance to the Beagle Channel. Feby 1834.* Pencil and ink drawing. MLib PXC 294 f.29.
- 130 Family group of Fuegians. n.d. Watercolour development of No. 129. MS.
- 131 Fuegian and his canoe. n.d. Watercolour development of No. 128. Engraved by T. Landseer with elements of No. 130 as 'Fuegian (Yapoo Tekeenica) at Portrait Cove' in *Narrative 2*, frontispiece. MS.
- 132 *Beagle Channel, sunset. March 2 - 34.* Drawing. RQMS Sketchbook IV f.17.
- 133 *Beagle Channel. March 3 1834.* Drawing. RQMS Sketchbook IV f.18.
- 134 *Beagle Channel, North side. March 3.* Drawing. RQMS Sketchbook IV f.19.
- 135 *Beagle Channel.* n.d. Initialled top right: RF. Drawing with colour notes. RQMS Sketchbook IV f.20.



- 136 *Beagle Channel. March 3 1834. Drawing. RQMS Sketchbook IV f.20 verso.*
- 137 *Mountains called the Dogs Jaws, height 3,900. Beagle Channel. March 3 1834. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.21.*
- 138 *The Beagle in Beagle Channel. n.d. Watercolour development of No. 137. NMM, PR 73-41 (10).*
- 139 *Beagle Channel looking west. Hoste Island 3500 ft [on left], Mount Darwin [behind]. March 3 1834. Initialed top left: RF. Double page panorama drawing. RQMS Sketchbook IV f.21 verso and f.22 recto.*
- 140 *Hoste Island and entrance to Ponsonby Sound, Mount Darwin [behind on right]. n.d. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.23.*
- 141 *Beagle Channel. March 4 1834. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.24.*
- 142 *Beagle Channel looking east. March 4 1834. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.24 verso and f.25 recto.*
- 143 *The Beagle in Beagle Channel. n.d. Watercolour development of No. 142. NMM, PR 73-41 (9).*
- 144 *Beagle Channel. March 4 1834. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.26.*
- 145 *Entrance to Ponsonby Sound from the Beagle Channel. March 4. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.27.*
- 146 *Beagle Channel. March 4. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.28.*
- 147 *Entrance to Ponsonby Sound from the Beagle Channel. March 4 1834. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.29.*
- 148 *Ponsonby Sound. Hoste Island [on left]. North side of Beagle Channel [behind, centre]. March 5 1834. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.30.*
- 149 *The Beagle in Beagle Channel. n.d. Watercolour development of No. 148. Engraved by T. Landseer as 'Murray Narrow - Beagle Channel' in *Narrative 2*, facing p.326. NMM, PR 73-41 (6).*
- 150 *The Beagle in Beagle Channel. n.d. Watercolour development of No. 148. Sold by C.M. to C.D. as 'View Ponsonby Sound' on 17 January 1836 for 3 guineas. GPD.*
- 151 *Ponsonby Sound. March 5 1834. Drawing. Engraved by T. Landseer as 'Button Island, near Woollya' in *Narrative 2*, facing p.323. RQMS Sketchbook IV f.31.*
- 152 *In Ponsonby Sound. Wullia, Fuegian name for this part of the Sound, and the residence of Jemmy Button's tribe. March 5. Initialed top right: RF. Double page drawing. RQMS Sketchbook IV f.31 verso and f.32 recto.*
- 153 *Ponsonby Sound. Distant peaks of Hoste Island [centre]. March 5 1834. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.33.*
- 154 *Ponsonby Sound. March 6th 1834. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.34.*
- 155 *[Head of] A Fuegian. n.d. Watercolour. RQMS Sketchbook IV f.34 verso.*
- 156 *Jemmy Button's Island, Ponsonby Sound. March 6 1834. Drawing. RQMS Sketchbook IV f.35.*
- 157 *Scene in Tierra del Fuego. Labelled on back, but not in C.M.'s hand: Conrad Martens, 1834. Watercolour development of No. 156. NLA, NK 2123.*
- 158 *Ponsonby Sound. March 6 1834. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.36.*
- 159 *Jemmy Button's Island, Ponsonby Sound. March 6 1834. Initialed top right: RF. Drawing. RQMS Sketchbook IV f.37.*



- 160 *Beagle Channel. Mt Darwin* [in distance, upper left]. n.d. but ? March 3. Watercolour. RQMS l.d.1.
- 161 Ship at sea with men in rowing boat behind. n.d. Drawing RQMS l.d.5.

## FALKLAND ISLANDS

- 162 *Settlement at Port Louis, East Falklands. March 11 1834.* Drawing. RQMS l.d.3.
- 163 *Port Louis, East Falklands. March 14 1834.* Initialled top right: RF. Drawing. RQMS Sketchbook IV f.38.
- 164 Port Louis. n.d. Watercolour development of No. 163. Engraved by J. W. Cook as 'Settlement at Port Louis' in *Narrative 2*, facing p.248. MS.
- 165 *Port Louis, East Falkland. March 25 1834.* Drawing in two strips. RQMS l.d.4.
- 166 Port Louis. n.d. Watercolour development of lower part of No. 165. Engraved by J. W. Cook as 'Berkeley Sound, Falkland Islands' in *Narrative 2*, facing p.248. NMM, PR 73-41 (5).
- 167 *Berkeley Sound, East Falklands. March 1834.* Drawing. RQMS l.d.9.
- 168 *The Steeple and grand Jason, E-S 6 leagues north of West Falklands - from a sketch by Lieut Wickham.* n.d. Drawing. RQMS l.d.11.
- 169 The *Beagle* running into Berkeley Sound. n.d. Watercolour. NMM, PR 67/10.

## SANTA CRUZ RIVER

- 170 Original drawing not located. Engraving by T. Landseer entitled 'Beagle laid ashore, River Santa Cruz' in *Narrative 2*, facing p.336.
- 171 *Santa Cruz River. April 26 1834.* Initialled top left: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.3.
- 172 Banks of the Santa Cruz River, Patagonia. n.d. Watercolour development of No. 171. Engraved by T. Landseer as 'Repairing boat' in *Narrative 2*, facing p.336. MS.
- 173 *Valley with a small stream running into Santa Cruz River, the hills crowned with Volcanic Rock, the most southern yet discovered. April 26.* Initialled top right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.4.
- 174 Basalt Glen on Santa Cruz River. n.d. Watercolour development of No. 173. Engraved by T. Landseer as 'Basalt Glen - River Santa Cruz' in *Narrative 2*, facing p.348. MS.
- 175 Santa Cruz River. *April 29.* Inscribed top right: RF, *very slight*. Double page panorama drawing. CUL Sketchbook I (ADD. MS 7984) f.4. verso and f.5 recto.
- 176 Santa Cruz River. *April 29.* Double page panorama drawing. CUL Sketchbook I (ADD. MS 7984) f.5 verso and f.6 recto.
- 177 Santa Cruz River. *April 30.* Initialled top right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.7.
- 178 Santa Cruz River. *April 30.* Initialled top right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.8.
- 179 Santa Cruz River with two men on the plain. n.d. Watercolour development of No. 178. MS.
- 180 *120 [miles] from the mouth [of the Santa Cruz River]. April 30.* Initialled top right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.9.
- 181 *130 [miles from the mouth of the Santa Cruz River looking] SW. May 1.* Initialled top right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.10.



## CONRAD MARTENS'S 'BEAGLE' PICTURES

- 182 [*Santa Cruz River*], *clear afternoon sky, east view*. May 1. Initialled top right: RF. CUL Sketchbook I (ADD. MS 7984) f.11.
- 183 130 miles from the mouth of the Santa Cruz River, looking east. n.d. Watercolour development of No. 182. MS.
- 184 [*Santa Cruz River*], *grey morning with yellowish light on the mountains*. May 2. Initialled top right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.12.
- 185 Banks of the Santa Cruz River with distant view of the Andes. n.d. Watercolour development of No. 184. Engraved by T. Landseer as 'Distant Cordillera of the Andes' in *Narrative 2*, facing p.336. MS.
- 186 *Distant view of eastern side of the Cordilleras – Lat. 50° 16'*. n.d. Drawing. CUL Sketchbook I (ADD. MS 7984) f.12 verso.
- 187 Distant view of the Andes from the Santa Cruz River. n.d. Watercolour development of No. 186. Engraved by S. Bull as 'Cordillera of the Andes, as seen from Mystery Plain, near the Santa Cruz' in *Narrative 2*, facing p.352. NMM, PR 73-41 (12).
- 188 Distant view of the Andes from the Santa Cruz River. n.d. Watercolour, variant of No. 186. NMM, PR 73-41 (13).
- 189 [*Santa Cruz River*], *afternoon, bright light catching on the distant mountains*. May 2. Initialled top right: RF. CUL Sketchbook I (ADD. MS 7984) f.13.
- 190 Shooting guanaco on the banks of the Santa Cruz River. n.d. Watercolour development of No. 189. NMM, PR 73-41 (14).
- 191 *Santa Cruz River. Evening*. May 3. Initialled top right: RF. Double page panorama drawing with the river coloured blue. CUL Sketchbook I (ADD. MS 7984) f.13 verso and f.14 recto.
- 192 Cordillera of the Andes from the Santa Cruz River. n.d. Watercolour development of No. 191. Engraved by S. Bull as 'Santa Cruz River, and distant view of the Andes' in *Narrative 2*, facing p.351. NMM, PR 73-41 (11).
- 193 Banks of Santa Cruz River. Signed: *C. Martens, Sydney 1836*. Watercolour, variant of No. 191 with column of men hauling boat. Sold by C.M. to C.D. as 'River Santa Cruz' on 21 January 1836 for 3 guineas. RGB.
- 194 Banks of Santa Cruz River. n.d. Watercolour very similar to No. 193. WRGH.
- 195 *Distant view of the Cordilleras as seen from the River Santa Cruz [?] miles from the mouth. May 4th 1834*. Inscribed top right: RF, 2 copies. Panorama drawing in six sections on three double pages. CUL Sketchbook I (ADD. MS 7984) f.14 verso to f.17 recto.
- 196 *Mouth of Santa Cruz River, Coast of Patagonia. May 9 1834*. Inscribed top right: *Capt. F.* Drawing. CUL Sketchbook I (ADD. MS 7984) f.17 verso and f.18 recto.
- 197 Condors preying on a dead guanaco, near the Santa Cruz River. n.d. Initialled bottom right: C.M. Watercolour. DLib, PX 34 f.13.
- 198 Scene in Patagonia. n.d. Watercolour, variant of No. 197. NGV, Felton Bequest 1688/4.

## THROUGH THE STRAIT OF MAGELLAN TO THE PACIFIC

- 199 *Cape Virgins bearing WNW, near the entrance to the Straits of Magalhaens. May 17 1834*. Initialled top right: H.O. Watercolour and drawing. cf. copy in RNA. RQMS Sketchbook IV f.39.
- 200 *Cape Possession. Straits of Magalhaens – bearing ESE. May 24 – 34*. Initialled top right: RF, H.O. Watercolour, cf. RNA C.M. No. VII. RQMS Sketchbook IV f.40.



- 201 *Mount Sarmiento, from Port Famine, June 3 1834 – the mountain can be seen from this place only in very clear weather, being distant 49 miles.* Initialled top right: RF. Drawing. RQMS Sketchbook IV f.41.
- 202 *Port Famine with the Adventure at anchor.* n.d. Watercolour, ? development of the right-hand part of No. 99 with the ship added. MS.
- 203 *Strait of Magalhaens. Cape Froward, the most southern point of South America [on right]. Mazaredo peak, Tierra del Fuego [on left]. June 9 1834.* Initialled top right: RF. Pencil and wash drawing. RQMS Sketchbook IV f.42.
- 204 *Cape Froward from Port St Antonio.* n.d. Watercolour heightened with chalk, ? painted by R.F. MS.
- 205 *Mount Boqueron, 3000 ft, Magdalen Channel. June 9 1834.* Initialled top right: RF. Pencil and wash drawing. RQMS Sketchbook IV f.43.
- 206 *The Beagle in the Magdalen Channel.* n.d. Watercolour development of No. 205. MS.
- 207 *The grand glacier, Mount Sarmiento. The mountain rises to about 3 times the height here seen, but all is here hidden by dark misty clouds – a faint sunny gleam lights the upper part of the glacier, giving its snowy surface a tinge which appears almost of a rose colour by being contrasted with the blue of its icy crags – a faint rainbow was likewise visible to the right of the glacier, but the whole was otherwise very grey & gloomy. June 9 1834.* Initialled top right: RF. Drawing. RQMS Sketchbook IV f.44.
- 208 *Mount Sarmiento.* n.d. Watercolour development of No. 207. Engraved by T. Landseer with elements of No. 213 as 'Mount Sarmiento (from Warp Bay)' in *Narrative 2*, facing p.359. MS.
- 209 *Lowe Cockburn Channel – Still morning – the vessel working out of Warp Cove from whence the sketch was taken. [On left] The ship's track was from behind this nearest point, which is the termination of Magdalen Channel. June 10 1834.* Drawing. RQMS Sketchbook IV f.45.
- 210 *Lowes Channel, Straits of Magalhaens. June 10 1834.* Signed lower left: C. Martens. Development of No. 209 in watercolour heightened with chalk. BM, L.B. 33.
- 211 *Warp Cove, taken from on board H.M.S. Beagle [with the 'Adventure' left centre]. Water dark brownish green and quite still – grey morning – getting under weigh – blue smoke rising from and hanging about the schooner – the Beagle sweeping out. June 10.* Initialled top right: RF. RQMS Sketchbook IV f.46.
- 212 *Mount Sarmiento, 7000 ft. The glacier is that which is seen in the two preceeding sketches. Insert, upper right: Telescopic appearance. June 10 1834.* Initialled top right: RF. Drawing. RQMS Sketchbook IV f.47.
- 213 *Mount Sarmiento.* n.d. Watercolour development of No. 212. NMM, PR 73-41 (8).
- 214 *Sarmiento. Note on left: The sky most commonly of a grey composed of blue of snow and lake, and no part darker than necessary to relieve the snow. The water is at times of a fine deep blue, and from the steepness of the shore in general no change of colour is observed. June 10.* Initialled top right: RF. Drawing. Engraved by T. Landseer as 'Mount Sarmiento' in *Narrative 1*, facing p.252. RQMS Sketchbook IV f.48.
- 215 *Lowe Channel. Cascade opposite FitzRoy Island. June 10 1834.* Initialled top right: RF. Drawing. RQMS Sketchbook IV f.49.
- 216 *The Adventure. [behind] The Fury rocks and entrance to Cockburn Channel. June 11 1834.* Drawing. DLib, PX 23 f.42d.
- 217 *The Adventure – wind quartering – going before the wind.* n.d. Drawings. DLib, PX 23 f.42a.
- 218 *Adventure, wind on starboard quarter.* n.d. Watercolour. DLib, PX 23 f.50.



## CHILOE

- 219 *At Chiloe. July 1 – 34.* Note in a different hand: *About 1840 the Governor of Chile established a penal colony at Punta Arenas and Port Famine, which miserably failed in consequence of a mutiny.* Initialled top right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.19.
- 220 Punta Arenas, Chiloe. n.d. Watercolour development of No. 219. Engraved by J. W. Cook as 'Pt. Arena – San Carlos, Chiloe' in *Narrative* 1, facing p.300. MS.
- 221 *Point Arenas and Isla de Cochinos. At Chiloe. July 2 1834.* Initialled top right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.20.
- 222 *Cottages at Chiloe, black with smoke. The houses have no chimneys, and the smoke issues from all parts of the roof. July 3 1834.* Initialled bottom right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.21.
- 223 Punta Arenas, Chiloe. n.d. Watercolour development of No. 222. Engraved by J. W. Cook as 'Near Pt. Arena' in *Narrative* 1, facing p.300. MS.
- 224 *Girl of Chiloe. July 4 1834.* Drawing. CUL Sketchbook I (ADD. MS 7984) f.22.
- 225 *Maria Mercedes and Don Manuel de Chiloe.* n.d. Drawing. CUL Sketchbook I (ADD. MS 7984) f.23.
- 226 *Volcano of Osorno, from Chiloe. Bright morning sky – sun just rising.* n.d. Initialled top right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.24.
- 227 *San Carlos, Chiloe. Lat. 41° 51' South. July 5 – 34.* Initialled top right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.25.
- 228 San Carlos, Chiloe. n.d. Watercolour development of No. 227. Engraved by S. Bute as 'San Carlos de Chiloe' in *Narrative* 1, facing p.275. MS.
- 229 *San Carlos, Island of Chiloe. July 5.* Initialled bottom right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.26.
- 230 Street with wooden houses in Chiloe. n.d. Watercolour development of No. 229. Engraved by S. Bute as 'San Carlos de Chiloe' in *Narrative* 1, facing p. 275. MS.
- 231 *Chiloe. July 7 1834.* Initialled top right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.27.
- 232 *Woman of Chiloe, weaving. July 8.* Drawing. CUL Sketchbook I (ADD. MS 7984) f.28.
- 233 *[Gathering wood on the] Island of Chiloe. July 8 1834.* Initialled bottom right: RF. Drawing. Incorporated in engraving by T. Landseer of a picture by P. P. King entitled 'Breast ploughing at Chiloe' in *Narrative* 1, facing p.287. CUL Sketchbook I (ADD. MS 7984) f.29.
- 234 *Forest scene at Chiloe. July 9 1834.* Initialled bottom right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.30.
- 235 *Forest scene at Chiloe. July 10 1834.* Drawing. CUL Sketchbook I (ADD. MS 7984) f.31.
- 236 *Maria Antonia de Chiloe. July 10 1834.* Drawing. CUL Sketchbook I (ADD. MS 7984) f.32.
- 237 *Island Chiloe. View at Point Arenas. July 11.* Initialled bottom right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.33.
- 238 View on Chiloe. n.d. Development of No. 237 in watercolour with gum arabic heightening. NMM, PR 73-41 (15).
- 239 *White sandy beach, Point Arenas, Island of Chiloe. July 12.* Initialled bottom right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.34.
- 240 Beach at Punta Arenas. n.d. Watercolour development of No. 239. MS.



## VALPARAISO

- 241 *Quebrada de San Augustine, Valparaiso. July 24/34.* Initialled top right: RF. Drawing. RQMS Sketchbook IV f.50.
- 242 *Quebrada de San Augustine, Valparaiso. n.d.* Signed on left: C. Martens. Chalk and watercolour development of No. 241. BM, L.B. 29.
- 243 Anchorage at Valparaiso. n.d. Drawing. RQMS Sketchbook IV f.51.
- 244 The harbour at Valparaiso with the *Mary Walker* of Glasgow at anchor. Inscribed bottom right: VALPARAISO, 1834. Watercolour from same viewpoint as No. 243. NLA, NK 154.
- 245 *Quebrada San Augustine. July 26/34.* Initialled bottom right: RF. Drawing. RQMS Sketchbook IV f.52.
- 246 *Quebrada San Augustine, Valparaiso. n.d.* Chalk and watercolour development of No. 245. BM, L.B. 31.
- 247 *View from Putney Bridge, Quebrada Augustine, Valparaiso. July 26.* Drawing. RQMS Sketchbook IV f.53.
- 248 *Quebrada Elias. July 28 1834.* Drawing. RQMS Sketchbook IV f.54.
- 249 *Quebrada de St Elias. July 28/34.* Initialled bottom right: RF. Drawing. RQMS Sketchbook IV f.55.
- 250 *Berger's house, Quebrada de St Elias, Valparaiso.* Signed on left: C. Martens 1834. Chalk and watercolour development of No. 249. BM, L.B. 32.
- 251 *Valparaiso from the anchorage. August 2/34.* Drawing. MLib, PXC 294 f.1 verso.
- 252 *The John Gilpin, Valparaiso. Made a passage of 15000 miles averaging 186  $\frac{1}{10}$  miles per day. August 3/34.* Drawing. DLib, PX 23 f.7 verso.
- 253 Bay of Valparaiso. *Aconcagua* [at a distance in centre]. *August 7/34.* Double page panorama drawing. CUL Sketchbook I (ADD. MS 7984) f.35 verso and f.36 recto.
- 254 *Eglise de San Francisco, Valparaiso. August 7/34.* Initialled bottom right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.35.
- 255 *Eglise de San Francisco, Valparaiso.* Signed bottom right: C. Martens August 1834. Chalk and watercolour development of No. 254. BM, L.B. 30.
- 256 *[Buildings on quayside] Valparaiso. August 16/34.* Initialled top right: RF. Drawing. RQMS Sketchbook IV f.56.
- 257 *[Buildings on quayside from greater distance] Valparaiso. August 16/34.* Drawing. RQMS Sketchbook IV f.57.
- 258 *Almendral, Valparaiso. August 17/34.* Initialled bottom right: RF. Double page panorama drawing. CUL Sketchbook I (ADD. MS 7984) f.36 verso and f.37 recto.
- 259 *In the Almendral, Valparaiso. n.d.* Chalk and watercolour drawing. BM, L.B. 28.
- 260 Bay of Valparaiso seen from a promontory, with ladies and gentlemen on horseback. n.d. Large watercolour, ? painted by J. M. Rugendas. NLA, NK 153.
- 261 Bay of Valparaiso looking towards Viña del Mar. n.d. Inscribed along lower border, not in C.M.'s hand: *This view represents part of the bay of Valparaiso as seen from the heights above the Castle looking towards Villa de Mar, in the extreme distance to the left is shown the stupendous mountain of Tupungato [sic] – '23,000 feet high. Horizontal distance from Ft Sn Anto, 89 miles. Vertical above horizontal plain 1° 56' at the above Fort'. Capt. FitzRoy R.N.* Large watercolour from same viewpoint as No. 253, ? painted by J. M. Rugendas. NLA, NK 8.
- 262 *Main top, Valparaiso. August 20 1834.* Note on left: *The Southern part of the Town is divided by two principal Ravines into three districts to which sailors have given the names of Fore Top,*



## CONRAD MARTENS'S 'BEAGLE' PICTURES

- Main Top and Mizzen Top*. Initialed bottom right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.37 verso and f.38 recto.
- 263 *Falls near Valparaiso. August 27/34*. Initialed top right: RF 4. Drawing. RQMS Sketchbook IV f.58.
- 264 *View on the road to Santiago near Valparaiso. August 27*. Drawing. RQMS Sketchbook IV f.59.
- 265 Huasos and carretas near Valparaiso n.d. Watercolour development of No. 264. MS.
- 266 [*Balconies of houses*] *Valparaiso. August 29/34*. Initialed bottom right: RF. Drawing. CUL Sketchbook I (ADD. MS 7984) f.39.
- 267 *H.M.S. Beagle [at anchor in Valparaiso]. Sept 1/34*. Drawing. DLib, PX 13 f.8.
- 268 *Catalina [a ship] at Valparaiso, Edwd. Vischer Eng. Sept 29/34*. Drawing. DLib, PX 23 f.49.
- 269 *View at Valparaiso: part of the Almendral, and the English and Spanish cemeteries. Nov 12/34*. Drawing. MLib, PXC 294 f.9.
- 270 *Quebrada Elias, Valparaiso. Nov. 12*. Note on back: *Sketched from the balcony of the house in which resided Conrad Martens*. Initialed: C.M. Watercolour. NLA, NK 5207/21.
- 271 *Part of Valparaiso from the Quebrada Elias. pd. 1834*. Signed bottom left: *C. Martens 1845*. Chalk and watercolour drawing. BM, L.B. 27.
- 272 *Valparaiso from the Santiago road. Nov 18/34*. Drawing. MLib, PXC 294 f.3.

## SOUTH SEA ISLANDS

- 273 *Gambier's Islands, bearing W.S.W. distant 12 miles, Lat. 2°11'. Decr 30/34*. CUL Sketchbook I (ADD. MS 7984) f.40.
- 274 *Aporeaitu, Moorea. Jany 22/35*. Drawing. CUL Sketchbook I (ADD. MS 7984) f.41.
- 275 *Aporeaitu. Jany 23/35*. Drawing. CUL Sketchbook I (ADD. MS 7984) f.42.
- 276 *Tabiti, from Aporeaitu. Jany 23/35*. Double page panorama drawing. CUL Sketchbook I (ADD. MS 7984) f.42 verso and f.43 recto.
- 277 *Aporeaitu. Jany 25/35*. Drawing. CUL Sketchbook I (ADD. MS 7984) f.44.
- 278 *Aporeaitu. Jany 25*. Drawing. CUL Sketchbook I (ADD. MS 7984) f.45.
- 279 [*Studies of*] *Sugar cane [and] Meia or Banana. n.d*. Drawing. CUL Sketchbook I (ADD. MS 7984) f.46.
- 280 *Castor oil plant. n.d*. Drawing. CUL Sketchbook I (ADD. MS 7984) f.47.
- 281 *Interior of the Island of Moorea with part of Cooks Harbour and Apunohu valley. Jany 26/35*. Drawing. CUL Sketchbook I (ADD. MS 7984) f.48.
- 282 *Bread fruit trees [in foreground of unidentified scene]. Jany 27/35*. Drawing. CUL Sketchbook I (ADD. MS 7984) f.49.
- 283 *South Sea Academy – Revd J. Simpson. Jany 29/35*. Drawing. CUL Sketchbook I (ADD. MS 7984) f.50.
- 284 *The church, Papetoai. Jany 29*. Drawing. CUL Sketchbook I (ADD. MS 7984) f.51.
- 285 *Papetoai. Jany 29*. Double page panorama drawing. CUL Sketchbook I (ADD. MS 7984) f.51 verso and f.52 recto.
- 286 *Cooks Harbour, Eimeo or Moorea, Papetoai. Jany 30/35*. Drawing. CUL Sketchbook I (ADD. MS 7984) f.53.
- 287 *View at the head of the Harbour of Papetoai. Jany 31*. Note top left: *Copied for Capt F*. Double page panorama drawing. Engraved by T. Landseer as 'Otaheite or Tahiti' in *Narrative 2*, facing p.509. CUL Sketchbook I (ADD. MS 7984) f.53 verso and f.54 recto.



- 288 *Valley of Apunohu, Moorea*. n.d. Drawing. CUL Sketchbook I (ADD. MS 7984) f.55.  
 289 Unidentified scene. n.d. Drawing. CUL Sketchbook I (ADD. MS 7984) f.56.  
 290 *View on the South side of Moorea*, [behind] *Moua roa or High mountain*. Feby 3/35. Note bottom left: *Painted for Capt F*. Drawing of which a watercolour development was sold by C.M. to R.F. on 28 January 1836 for 2 guineas. Engraved by T. Landseer as 'Eimeo near Otaheite' in *Narrative* 2, facing p.517. CUL Sketchbook I (ADD. MS 7984) f.57.  
 291 *Tabuna, Tabiti*. n.d. Drawing. CUL Sketchbook I (ADD. MS 7984) f.58.  
 292 *Papieti Harbour. Distant view of Moorea from Tabiti*. Feby 6. Drawing. CUL Sketchbook I (ADD. MS 7984) f.59.  
 293 *Tonnoa*. Scene otherwise unidentified. n.d. Drawing. CUL Sketchbook I (ADD. MS 7984) f.60.  
 294 *The Queen Pomare's house, Matu uta, Tabiti*. Feby 7/35. Drawing. CUL Sketchbook I (ADD. MS 7984) f.61.  
 295 *Houses on Matu uta, Tabiti*. Feby 7. Drawing. CUL Sketchbook I (ADD. MS 7984) f.62.  
 296 *View in Papieti Harbour, Tabiti*. Feby 7. Drawing. CUL Sketchbook I (ADD. MS 7984) f.63.  
 297 *Cottage at Tabiti*. Feby 9/35. Drawing. CUL Sketchbook I (ADD. MS 7984) f.64.  
 298 *Tano plant, Tabiti*. Feb 7. Drawing. CUL Sketchbook I (ADD. MS 7984) f.65.

## VARIOUS

- 299 Coastal silhouettes: Nos. I–VI, East coast of Patagonia; Nos. VII–VIII, Strait of Magellan; Nos. IX–XVI, East coast of Tierra del Fuego; Nos. XVII, XIX, Tierra del Fuego; No. XVIII, Staten Land. n.d. Watercolours. RNA.  
 300 Small sketchbook containing studies of Fuegians (cf. No. 129), Patagonians, Rio de la Plata, Montevideo, Port St Julian (cf. No. 92) etc. n.d. Drawings. DLib, PX 12.  
 301 Small sketchbook containing studies of ships (cf. No. 267), plants, Quebrada Verde, Quebrada Elias, etc. Dates between September 1834 and April 1835. Drawings. DLib, PX 13.  
 302 Nineteen sketches of Beagle Channel, Mount Sarmiento, Jemmy Button's Island, Ponsonby Sound, Valparaiso, etc. Copied by Rebecca Martens in 1851 from originals in RQMS Sketchbook IV. DLib, PX 23.  
 303 Thirty one pencil studies of scenes in Tahiti. 1835. DLib, PX 23; MLib PXC 294, PXC 299.  
 304 Island of Moorea (Eimeo) near Tahiti. 1840. Oil painting. MLib DG 215.  
 305 The harbour of Papiete, Island of Tahiti. 1841. Oil painting. MLib DI 27.  
 306 Papeete, Tahiti. n.d. Oil painting. MLib DG 160.  
 307 Seventeen pencil studies of scenes in Bay of Islands, New Zealand. DLib PX 13; MLib PX A67, PXC 294, PX D307–6.



# *Principal published sources*

## 1 *Narrative*

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Henry Colburn, London, 1839.

Volume 1. Proceedings of the first expedition, 1826–1830, under the command of Captain P. Parker King, R.N., F.R.S.

Volume 2. Proceedings of the second expedition, 1831–1836, under the command of Captain Robert Fitz-Roy, R.N.

Volume 3. Journal and remarks, 1832–1836. By Charles Darwin, Esq., M.A. Sec. Geol. Soc.

## 2 *Zoology*

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Pt. 3. Birds. By John Gould.

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## 3 *Letters*

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3 vols, John Murray, London, 1887.

## 4 *Diary*

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## 5 *Darwin and Beagle*

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## 6 *Autobiography*

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## 7 *Darwin and Henslow*

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# Charles Darwin's Natural Selection

EDITED BY R. C. STAUFFER

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