

This is a short excerpt from *Journals of Researches into the Geology & Natural History of the Various Countries visited during the Voyage of H.M.S. Beagle round the World* (the 1906 edition). Darwin describes this volume *as being written in the form of a journal, brief history of our voyage, a sketch of those observations in Natural History and Geology, which I think will possess some interest for the general reader*. The selection provided here is from Chapter X Tierra Del Fuego; it discusses the region we will be visiting. The Voyage of the Beagle is obviously a well polished narrative but; it is based on Darwin's daily journals he kept during his voyage around the world and provides insight into the preparation of a journal. The book is still available however; the current editions are titled *Charles Darwin's Voyage around the World*. For those of you with the time you might want to read the entire book (used copies turn up at recycled books on occasion). Many of you will want to read the book in its entirety after we return from Chile.

one, what singular and numerous peculiarities are transmitted with certainty, by buds, layers, and grafts, which by seminal propagation never or only casually reappear.

CHAPTER X

TIERRA DEL FUEGO

Tierra del Fuego, first arrival—Good Success Bay—An Account of the Fuegians on board—Interview with the Savages—Scenery of the Forests—Cape Horn—Wigwam Cove—Miserable Condition of the Savages—Famines—Cannibals—Matricide—Religious feelings—Great Gale—Beagle Channel—Ponsonby Sound—Build Wigwams and settle the Fuegians—Bifurcation of the Beagle Channel—Glaciers—Return to the Ship—Second Visit in the Ship to the Settlement—Equality of Condition amongst the Natives.

December 17th, 1832.—Having now finished with Patagonia and the Falkland Islands, I will describe our first arrival in Tierra del Fuego. A little after noon we doubled Cape St. Diego, and entered the famous strait of Le Maire. We kept close to the Fuegian shore, but the outline of the rugged, inhospitable Staten-land was visible amidst the clouds. In the afternoon we anchored in the Bay of Good Success. While entering we were saluted in a manner becoming the inhabitants of this savage land. A group of Fuegians partly concealed by the entangled forest, were perched on a wild point overhanging the sea; and as we passed by, they sprang up and waving their tattered cloaks sent forth a loud and sonorous shout. The savages followed the ship, and just before dark we saw their fire, and again heard their wild cry. The harbour consists of a fine piece of water half surrounded by low rounded mountains of clay-slate, which are covered to the water's edge by one dense gloomy forest. A single glance at the landscape was sufficient to show me how widely different it was from any thing I had ever beheld. At night it blew a gale of wind, and heavy squalls from the mountains swept past us. It would have been a bad time out at sea, and we, as well as others, may call this Good Success Bay.

In the morning the Captain sent a party to communicate with the Fuegians. When we came within hail, one of the four natives who were present advanced to receive us, and began to shout most vehemently, wishing to direct us where to land. When we were on shore the party looked rather alarmed, but continued talking and making gestures with great rapidity. It was without exception the most

curious and interesting spectacle I ever beheld: I could not have believed how wide was the difference between savage and civilized man: it is greater than between a wild and domesticated animal, inasmuch as in man there is a greater power of improvement. The chief spokesman was old, and appeared to be the head of the family; the three others were powerful young men, about six feet high. The women and children had been sent away. These Fuegians are a very different race from the stunted, miserable wretches farther westward; and they seem closely allied to the famous Patagonians of the Strait of Magellan. Their only garment consists of a mantle made of guanaco skin, with the wool outside; this they wear just thrown over their shoulders, leaving their persons as often exposed as covered. Their skin is of a dirty coppery red colour.

The old man had a fillet of white feathers tied round his head, which partly confined his black, coarse, and entangled hair. His face was crossed by two broad transverse bars; one, painted bright red, reached from ear to ear and included the upper lip; the other, white like chalk, extended above and parallel to the first, so that even his eyelids were thus coloured. The other two men were ornamented by streaks of black powder, made of charcoal. The party altogether closely resembled the devils which come on the stage in plays like *Der Freischutz*.

Their very attitudes were abject, and the expression of their countenances distrustful, surprised, and startled. After we had presented them with some scarlet cloth, which they immediately tied round their necks, they became good friends. This was shown by the old man patting our breasts, and making a chuckling kind of noise, as people do when feeding chickens. I walked with the old man, and this demonstration of friendship was repeated several times; it was concluded by three hard slaps, which were given me on the breast and back at the same time. He then bared his bosom for me to return the compliment, which being done, he seemed highly pleased. The language of these people, according to our notions, scarcely deserves to be called articulate. Captain Cook has compared it to a man clearing his throat, but certainly no European ever cleared his throat with so many hoarse, guttural, and clicking sounds.

They are excellent mimics: as often as we coughed or yawned, or made any odd motion, they immediately

imitated us. Some of our party began to squint and look awry; but one of the young Fuegians (whose whole face was painted black, excepting a white band across his eyes) succeeded in making far more hideous grimaces. They could repeat with perfect correctness each word in any sentence we addressed them, and they remembered such words for some time. Yet we Europeans all know how difficult it is to distinguish apart the sounds in a foreign language. Which of us, for instance, could follow an American Indian through a sentence of more than three words? All savages appear to possess, to an uncommon degree, this power of mimicry. I was told, almost in the same words, of the same ludicrous habit among the Caffres: the Australians, likewise, have long been notorious for being able to imitate and describe the gait of any man, so that he may be recognized. How can this faculty be explained? is it a consequence of the more practised habits of perception and keener senses, common to all men in a savage state, as compared with those long civilized?

When a song was struck up by our party, I thought the Fuegians would have fallen down with astonishment. With equal surprise they viewed our dancing; but one of the young men, when asked, had no objection to a little waltzing. Little accustomed to Europeans as they appeared to be, yet they knew and dreaded our fire-arms; nothing would tempt them to take a gun in their hands. They begged for knives, calling them by the Spanish word "cuchilla." They explained also what they wanted, by acting as if they had a piece of blubber in their mouth, and then pretending to cut instead of tear it.

I have not as yet noticed the Fuegians whom we had on board. During the former voyage of the *Adventure* and *Beagle* in 1826 to 1830, Captain Fitz Roy seized on a party of natives, as hostages for the loss of a boat, which had been stolen, to the great jeopardy of a party employed on the survey; and some of these natives, as well as a child whom he bought for a pearl-button, he took with him to England, determining to educate them and instruct them in religion at his own expense. To settle these natives in their own country, was one chief inducement to Captain Fitz Roy to undertake our present voyage; and before the Admiralty had resolved to send out this expedition, Captain Fitz Roy had generously chartered a vessel, and would himself have taken them back. The

natives were accompanied by a missionary, R. Matthews; of whom and of the natives, Captain Fitz Roy has published a full and excellent account. Two men, one of whom died in England of the small-pox, a boy and a little girl, were originally taken; and we had now on board, York Minster, Jemmy Button (whose name expresses his purchase-money), and Fuegia Basket. York Minster was a full-grown, short, thick, powerful man: his disposition was reserved, taciturn, morose, and when excited violently passionate; his affections were very strong towards a few friends on board; his intellect good. Jemmy Button was a universal favourite, but likewise passionate; the expression of his face at once showed his nice disposition. He was merry and often laughed, and was remarkably sympathetic with any one in pain: when the water was rough, I was often a little sea-sick, and he used to come to me and say in a plaintive voice, "Poor, poor fellow!" but the notion, after his aquatic life, of a man being sea-sick, was too ludicrous, and he was generally obliged to turn on one side to hide a smile or laugh, and then he would repeat his "Poor, poor fellow!" He was of a patriotic disposition; and he liked to praise his own tribe and country, in which he truly said there were "plenty of trees," and he abused all the other tribes: he stoutly declared that there was no Devil in his land. Jemmy was short, thick, and fat, but vain of his personal appearance; he used to wear gloves, his hair was neatly cut, and he was distressed if his well-polished shoes were dirtied. He was fond of admiring himself in a looking-glass; and a merry-faced little Indian boy from the Rio Negro, whom we had for some months on board, soon perceived this, and used to mock him: Jemmy, who was always rather jealous of the attention paid to this little boy, did not at all like this, and used to say, with rather a contemptuous twist of his head, "Too much skylark." It seems yet wonderful to me, when I think over all his many good qualities, that he should have been of the same race, and doubtless partaken of the same character, with the miserable, degraded savages whom we first met here. Lastly, Fuegia Basket was a nice, modest, reserved young girl, with a rather pleasing but sometimes sullen expression, and very quick in learning anything, especially languages. This she showed in picking up some Portuguese and Spanish, when left on shore for only a short time at Rio de Janeiro and

Monte Video, and in her knowledge of English. York Minster was very jealous of any attention paid to her; for it was clear he determined to marry her as soon as they were settled on shore.

Although all three could both speak and understand a good deal of English, it was singularly difficult to obtain much information from them, concerning the habits of their countrymen: this was partly owing to their apparent difficulty in understanding the simplest alternative. Every one accustomed to very young children, knows how seldom one can get an answer even to so simple a question as whether a thing is black or white; the idea of black or white seems alternately to fill their minds. So it was with these Fuegians, and hence it was generally impossible to find out, by cross-questioning, whether one had rightly understood anything which they had asserted. Their sight was remarkably acute: it is well known that sailors, from long practice, can make out a distant object much better than a landsman; but both York and Jemmy were much superior to any sailor on board: several times they have declared what some distant object has been, and though doubted by every one, they have proved right, when it has been examined through a telescope. They were quite conscious of this power; and Jemmy, when he had any little quarrel with the officer on watch, would say, "Me see ship, me no tell."

It was interesting to watch the conduct of the savages, when we landed, towards Jemmy Button: they immediately perceived the difference between him and ourselves, and held much conversation one with another on the subject. The old man addressed a long harangue to Jemmy, which it seems was to invite him to stay with them. But Jemmy understood very little of their language, and was, moreover, thoroughly ashamed of his countrymen. When York Minster afterwards came on shore, they noticed him in the same way, and told him he ought to shave; yet he had not twenty dwarf hairs on his face, whilst we all wore our untrimmed beards. They examined the colour of his skin, and compared it with ours. One of our arms being bared, they expressed the liveliest surprise and admiration at its whiteness, just in the same way in which I have seen the ourang-outang do at the Zoological Gardens. We thought that they mistook two or three of the officers, who were rather shorter and fairer, though adorned with large

beards, for the ladies of our party. The tallest among the Fuegians was evidently much pleased at his height being noticed. When placed back to back with the tallest of the boat's crew, he tried his best to edge on higher ground, and to stand on tiptoe. He opened his mouth to show his teeth, and turned his face for a side view; and all this was done with such alacrity, that I dare say he thought himself the handsomest man in Tierra del Fuego. After our first feeling of grave astonishment was over, nothing could be more ludicrous than the odd mixture of surprise and imitation which these savages every moment exhibited.

The next day I attempted to penetrate some way into the country. Tierra del Fuego may be described as a mountainous land, partly submerged in the sea, so that deep inlets and bays occupy the place where valleys should exist. The mountain sides, except on the exposed western coast, are covered from the water's edge upwards by one great forest. The trees reach to an elevation of between 1000 and 1500 feet, and are succeeded by a band of peat, with minute alpine plants; and this again is succeeded by the line of perpetual snow, which, according to Captain King, in the Strait of Magellan descends to between 3000 and 4000 feet. To find an acre of level land in any part of the country is most rare. I recollect only one little flat piece near Port Famine, and another of rather larger extent near Goeree Road. In both places, and everywhere else, the surface is covered by a thick bed of swampy peat. Even within the forest, the ground is concealed by a mass of slowly putrefying vegetable matter, which, from being soaked with water, yields to the foot.

Finding it nearly hopeless to push my way through the wood, I followed the course of a mountain torrent. At first, from the waterfalls and number of dead trees, I could hardly crawl along; but the bed of the stream soon became a little more open, from the floods having swept the sides. I continued slowly to advance for an hour along the broken and rocky banks, and was amply repaid by the grandeur of the scene. The gloomy depth of the ravine well accorded with the universal signs of violence. On every side were lying irregular masses of rock and torn-up trees; other trees, though still erect, were decayed to the heart and ready to fall. The entangled mass

of the thriving and the fallen reminded me of the forests within the tropics—yet there was a difference: for in these still solitudes, Death, instead of Life, seemed the predominant spirit. I followed the watercourse till I came to a spot, where a great slip had cleared a straight space down the mountain side. By this road I ascended to a considerable elevation, and obtained a good view of the surrounding woods. The trees all belong to one kind, the *Fagus betuloides*; for the number of the other species of *Fagus* and of the *Winter's Bark*, is quite inconsiderable. This beech keeps its leaves throughout the year; but its foliage is of a peculiar brownish-green colour, with a tinge of yellow. As the whole landscape is thus coloured, it has a sombre, dull appearance; nor is it often enlivened by the rays of the sun.

December 20th.—One side of the harbour is formed by a hill about 1500 feet high, which Captain Fitz Roy has called after Sir J. Banks, in commemoration of his disastrous excursion, which proved fatal to two men of his party, and nearly so to Dr. Solander. The snow-storm, which was the cause of their misfortune, happened in the middle of January, corresponding to our July, and in the latitude of Durham! I was anxious to reach the summit of this mountain to collect alpine plants; for flowers of any kind in the lower parts are few in number. We followed the same watercourse as on the previous day, till it dwindled away, and we were then compelled to crawl blindly among the trees. These, from the effects of the elevation and of the impetuous winds, were low, thick, and crooked. At length we reached that which from a distance appeared like a carpet of fine green turf, but which, to our vexation, turned out to be a compact mass of little beech-trees about four or five feet high. They were as thick together as box in the border of a garden, and we were obliged to struggle over the flat but treacherous surface. After a little more trouble we gained the peat, and then the bare slate rock.

A ridge connected this hill with another, distant some miles, and more lofty, so that patches of snow were lying on it. As the day was not far advanced, I determined to walk there and collect plants along the road. It would have been very hard work, had it not been for a well-beaten and straight path made by the *guanacos*; for these animals, like sheep, always follow the same line.

When we reached the hill we found it the highest in the immediate neighbourhood, and the waters flowed to the sea in opposite directions. We obtained a wide view over the surrounding country: to the north a swampy moorland extended, but to the south we had a scene of savage magnificence, well becoming *Tierra del Fuego*. There was a degree of mysterious grandeur in mountain behind mountain, with the deep intervening valleys, all covered by one thick, dusky mass of forest. The atmosphere, likewise, in this climate, where gale succeeds gale, with rain, hail, and sleet, seems blacker than anywhere else. In the Strait of Magellan, looking due southward from Port Famine, the distant channels between the mountains appeared from their gloominess to lead beyond the confines of this world.

December 21st.—The *Beagle* got under weigh: and on the succeeding day, favoured to an uncommon degree by a fine easterly breeze, we closed in with the *Barnevelts*, and running past Cape Deceit with its stony peaks, about three o'clock doubled the weather-beaten Cape Horn. The evening was calm and bright, and we enjoyed a fine view of the surrounding isles. Cape Horn, however, demanded his tribute, and before night sent us a gale of wind directly in our teeth. We stood out to sea, and on the second day again made the land, when we saw on our weather-bow this notorious promontory in its proper form—veiled in a mist, and its dim outline surrounded by a storm of wind and water. Great black clouds were rolling across the heavens, and squalls of rain, with hail, swept by us with such extreme violence, that the Captain determined to run into Wigwam Cove. This is a snug little harbour, not far from Cape Horn; and here, at Christmas-eve, we anchored in smooth water. The only thing which reminded us of the gale outside, was every now and then a puff from the mountains, which made the ship surge at her anchors.

December 25th.—Close by the cove, a pointed hill, called Kater's Peak, rises to the height of 1700 feet. The surrounding islands all consist of conical masses of greenstone, associated sometimes with less regular hills of baked and altered clay-slate. This part of *Tierra del Fuego* may be considered as the extremity of the submerged chain of mountains already alluded to. The cove takes its name of "Wigwam" from some of the Fuegian

habitations; but every bay in the neighbourhood might be so called with equal propriety. The inhabitants, living chiefly upon shell-fish, are obliged constantly to change their place of residence; but they return at intervals to the same spots, as is evident from the piles of old shells, which must often amount to many tons in weight. These heaps can be distinguished at a long distance by the bright green colour of certain plants, which invariably grow on them. Among these may be enumerated the wild celery and scurvy grass, two very serviceable plants, the use of which has not been discovered by the natives.

The Fuegian wigwam resembles, in size and dimensions, a haycock. It merely consists of a few broken branches stuck in the ground, and very imperfectly thatched on one side with a few tufts of grass and rushes. The whole cannot be the work of an hour, and it is only used for a few days. At Goeree Roads I saw a place where one of these naked men had slept, which absolutely offered no more cover than the form of a hare. The man was evidently living by himself, and York Minster said he was "very bad man," and that probably he had stolen something. On the west coast, however, the wigwams are rather better, for they are covered with seal-skins. We were detained here several days by the bad weather. The climate is certainly wretched: the summer solstice was now passed, yet every day snow fell on the hills, and in the valleys there was rain, accompanied by sleet. The thermometer generally stood about 45°, but in the night fell to 38° or 40°. From the damp and boisterous state of the atmosphere, not cheered by a gleam of sunshine, one fancied the climate even worse than it really was.

While going one day on shore near Wollaston Island, we pulled alongside a canoe with six Fuegians. These were the most abject and miserable creatures I anywhere beheld. On the east coast the natives, as we have seen, have guanaco cloaks, and on the west, they possess seal-skins. Amongst these central tribes the men generally have an otter-skin, or some small scrap about as large as a pocket-handkerchief, which is barely sufficient to cover their backs as low down as their loins. It is laced across the breast by strings, and according as the wind blows, it is shifted from side to side. But these Fuegians in the canoe were quite naked, and even one full-grown

woman was absolutely so. It was raining heavily, and the fresh water, together with the spray, trickled down her body. In another harbour not far distant, a woman, who was suckling a recently-born child, came one day alongside the vessel, and remained there out of mere curiosity, whilst the sleet fell and thawed on her naked bosom, and on the skin of her naked baby! These poor wretches were stunted in their growth, their hideous faces bedaubed with white paint, their skins filthy and greasy, their hair entangled, their voices discordant, and their gestures violent. Viewing such men, one can hardly make oneself believe that they are fellow-creatures, and inhabitants of the same world. It is a common subject of conjecture what pleasure in life some of the lower animals can enjoy: how much more reasonably the same question may be asked with respect to these barbarians! At night, five or six human beings, naked and scarcely protected from the wind and rain of this tempestuous climate, sleep on the wet ground coiled up like animals. Whenever it is low water, winter or summer, night or day, they must rise to pick shell-fish from the rocks; and the women either dive to collect sea-eggs, or sit patiently in their canoes, and with a baited hair-line without any hook, jerk out little fish. If a seal is killed, or the floating carcass of a putrid whale discovered, it is a feast; and such miserable food is assisted by a few tasteless berries and fungi.

They often suffer from famine: I heard Mr. Low, a sealing-master intimately acquainted with the natives of this country, give a curious account of the state of a party of one hundred and fifty natives on the west coast, who were very thin and in great distress. A succession of gales prevented the women from getting shell-fish on the rocks, and they could not go out in their canoes to catch seal. A small party of these men one morning set out, and the other Indians explained to him, that they were going a four days' journey for food: on their return, Low went to meet them, and he found them excessively tired, each man carrying a great square piece of putrid whales-blubber with a hole in the middle, through which they put their heads, like the Gauchos do through their ponchos or cloaks. As soon as the blubber was brought into a wigwam, an old man cut off thin slices, and muttering over them, broiled them for a

minute, and distributed them to the famished party, who during this time preserved a profound silence. Mr. Low believes that whenever a whale is cast on shore, the natives bury large pieces of it in the sand, as a resource in time of famine; and a native boy, whom he had on board, once found a stock thus buried. The different tribes when at war are cannibals. From the concurrent, but quite independent evidence of the boy taken by Mr. Low, and of Jemmy Button, it is certainly true, that when pressed in winter by hunger, they kill and devour their old women before they kill their dogs: the boy, being asked by Mr. Low why they did this, answered, "Doggies catch otters, old women no." This boy described the manner in which they are killed by being held over smoke and thus choked; he imitated their screams as a joke, and described the parts of their bodies which are considered best to eat. Horrid as such a death by the hands of their friends and relatives must be, the fears of the old women, when hunger begins to press, are more painful to think of; we were told that they then often run away into the mountains, but that they are pursued by the men and brought back to the slaughter-house at their own fire-sides!

Captain Fitz Roy could never ascertain that the Fuegians have any distinct belief in a future life. They sometimes bury their dead in caves, and sometimes in the mountain forests; we do not know what ceremonies they perform. Jemmy Button would not eat land-birds, because "eat dead men:" they are unwilling even to mention their dead friends. We have no reason to believe that they perform any sort of religious worship; though perhaps the muttering of the old man before he distributed the putrid blubber to his famished party, may be of this nature. Each family or tribe has a wizard or conjuring doctor, whose office we could never clearly ascertain. Jemmy believed in dreams, though not, as I have said, in the devil: I do not think that our Fuegians were much more superstitious than some of the sailors; for an old quarter-master firmly believed that the successive heavy gales, which we encountered off Cape Horn, were caused by our having the Fuegians on board. The nearest approach to a religious feeling which I heard of, was shown by York Minster, who, when Mr. Bynoe shot some very young ducklings as specimens, declared in the

most solemn manner, "Oh Mr. Bynoe, much rain, snow, blow much." This was evidently a retributive punishment for wasting human food. In a wild and excited manner he also related, that his brother, one day whilst returning to pick up some dead birds which he had left on the coast, observed some feathers blown by the wind. His brother said (York imitating his manner), "What that?" and crawling onwards, he peeped over the cliff, and saw "wild man" picking his birds; he crawled a little nearer, and then hurled down a great stone and killed him. York declared for a long time afterwards storms raged, and much rain and snow fell. As far as we could make out, he seemed to consider the elements themselves as the avenging agents: it is evident in this case, how naturally, in a race a little more advanced in culture, the elements would become personified. What the "bad wild men" were, has always appeared to me most mysterious: from what York said, when we found the place like the form of a hare, where a single man had slept the night before, I should have thought that they were thieves who had been driven from their tribes; but other obscure speeches made me doubt this; I have sometimes imagined that the most probable explanation was that they were insane.

The different tribes have no government or chief; yet each is surrounded by other hostile tribes, speaking different dialects, and separated from each other only by a deserted border or neutral territory: the cause of their warfare appears to be the means of subsistence. Their country is a broken mass of wild rocks, lofty hills, and useless forests: and these are viewed through mists and endless storms. The habitable land is reduced to the stones on the beach; in search of food they are compelled unceasingly to wander from spot to spot, and so steep is the coast, that they can only move about in their wretched canoes. They cannot know the feeling of having a home, and still less that of domestic affection; for the husband is to the wife a brutal master to a laborious slave. Was a more horrid deed ever perpetrated, than that witnessed on the west coast by Byron, who saw a wretched mother pick up her bleeding dying infant-boy, whom her husband had mercilessly dashed on the stones for dropping a basket of sea-eggs! How little can the higher powers of the mind be brought into

play: what is there for imagination to picture, for reason to compare, for judgment to decide upon? to knock a limpet from the rock does not require even cunning, that lowest power of the mind. Their skill in some respects may be compared to the instinct of animals; for it is not improved by experience: the canoe, their most ingenious work, poor as it is, has remained the same, as we know from Drake, for the last two hundred and fifty years.

Whilst beholding these savages, one asks, whence have they come? What could have tempted, or what change compelled a tribe of men, to leave the fine regions of the north, to travel down the Cordillera or backbone of America, to invent and build canoes, which are not used by the tribes of Chile, Peru, and Brazil, and then to enter on one of the most inhospitable countries within the limits of the globe? Although such reflections must at first seize on the mind, yet we may feel sure that they are partly erroneous. There is no reason to believe that the Fuegians decrease in number; therefore we must suppose that they enjoy a sufficient share of happiness, of whatever kind it may be, to render life worth having. Nature by making habit omnipotent, and its effects hereditary, has fitted the Fuegian to the climate and the productions of his miserable country.

After having been detained six days in Wigwam Cove by very bad weather, we put to sea on the 30th of December. Captain Fitz Roy wished to get westward to land York and Fuegia in their own country. When at sea we had a constant succession of gales, and the current was against us: we drifted to $57^{\circ} 23'$ south. On the 11th of January, 1833, by carrying a press of sail, we fetched within a few miles of the great rugged mountain of York Minster (so called by Captain Cook, and the origin of the name of the elder Fuegian), when a violent squall compelled us to shorten sail and stand out to sea. The surf was breaking fearfully on the coast, and the spray was carried over a cliff estimated at 200 feet in height. On the 12th the gale was very heavy, and we did not know exactly where we were: it was a most unpleasant sound to hear constantly repeated, "keep a good look-out to leeward." On the 13th the storm raged with its full fury: our horizon was narrowly

limited by the sheets of spray borne by the wind. The sea looked ominous, like a dreary waving plain with patches of drifted snow: whilst the ship laboured heavily, the albatross glided with its expanded wings right up the wind. At noon a great sea broke over us, and filled one of the whale-boats, which was obliged to be instantly cut away. The poor *Beagle* trembled at the shock, and for a few minutes would not obey her helm; but soon, like a good ship that she was, she righted and came up to the wind again. Had another sea followed the first, our fate would have been decided soon, and for ever. We had now been twenty-four days trying in vain to get westward; the men were worn out with fatigue, and they had not for many nights or days a dry thing to put on. Captain Fitz Roy gave up the attempt to get westward by the outside coast. In the evening we ran in behind False Cape Horn, and dropped our anchor in forty-seven fathoms, fire flashing from the windlass as the chain rushed round it. How delightful was that still night, after having been so long involved in the din of the warring elements!

January 15th, 1833.—The *Beagle* anchored in Goeree Roads. Captain Fitz Roy having resolved to settle the Fuegians, according to their wishes, in Ponsonby Sound, four boats were equipped to carry them there through the Beagle Channel. This channel, which was discovered by Captain Fitz Roy during the last voyage, is a most remarkable feature in the geography of this, or indeed of any other country: it may be compared to the valley of Lochness in Scotland, with its chain of lakes and friths. It is about one hundred and twenty miles long, with an average breadth, not subject to any very great variation, of about two miles; and is throughout the greater part so perfectly straight, that the view, bounded on each side by a line of mountains, gradually becomes indistinct in the long distance. It crosses the southern part of Tierra del Fuego in an east and west line, and in the middle is joined at right angles on the south side by an irregular channel, which has been called Ponsonby Sound. This is the residence of Jemmy Button's tribe and family.

19th.—Three whale-boats and the yawl, with a party of twenty-eight, started under the command of Captain Fitz Roy. In the afternoon we entered the eastern

mouth of the channel, and shortly afterwards found a snug little cove concealed by some surrounding islets. Here we pitched our tents and lighted our fires. Nothing could look more comfortable than this scene. The glassy water of the little harbour, with the branches of the trees hanging over the rocky beach, the boats at anchor, the tents supported by the crossed oars, and the smoke curling up the wooded valley, formed a picture of quiet retirement. The next day (20th) we smoothly glided onwards in our little fleet, and came to a more inhabited district. Few if any of these natives could ever have seen a white man; certainly nothing could exceed their astonishment at the apparition of the four boats. Fires were lighted on every point (hence the name of Tierra del Fuego, or the land of fire), both to attract our attention and to spread far and wide the news. Some of the men ran for miles along the shore. I shall never forget how wild and savage one group appeared: suddenly four or five men came to the edge of an overhanging cliff; they were absolutely naked, and their long hair streamed about their faces; they held rugged staffs in their hands, and, springing from the ground, they waved their arms round their heads, and sent forth the most hideous yells.

At dinner-time we landed among a party of Fuegians. At first they were not inclined to be friendly; for until the Captain pulled in ahead of the other boats, they kept their slings in their hands. We soon, however, delighted them by trifling presents, such as tying red tape round their heads. They liked our biscuit: but one of the savages touched with his finger some of the meat preserved in tin cases which I was eating, and feeling it soft and cold, showed as much disgust at it, as I should have done at putrid blubber. Jemmy was thoroughly ashamed of his countrymen, and declared his own tribe were quite different, in which he was woefully mistaken. It was as easy to please as it was difficult to satisfy these savages. Young and old, men and children, never ceased repeating the word "yammerschooner," which means "give me." After pointing to almost every object, one after the other, even to the buttons on our coats, and saying their favourite word in as many intonations as possible, they would then use it in a neuter sense, and vacantly repeat "yammerschooner." After yammerschoonering for any article very eagerly, they

would by a simple artifice point to their young women or little children, as much as to say, "If you will not give it me, surely you will to such as these."

At night we endeavoured in vain to find an uninhabited cove; and at last were obliged to bivouac not far from a party of natives. They were very inoffensive as long as they were few in numbers, but in the morning (21st) being joined by others they showed symptoms of hostility, and we thought that we should have come to a skirmish. An European labours under great disadvantages when treating with savages like these, who have not the least idea of the power of fire-arms. In the very act of levelling his musket he appears to the savage far inferior to a man armed with a bow and arrow, a spear, or even a sling. Nor is it easy to teach them our superiority except by striking a fatal blow. Like wild beasts, they do not appear to compare numbers; for each individual, if attacked, instead of retiring, will endeavour to dash your brains out with a stone, as certainly as a tiger under similar circumstances would tear you. Captain Fitz Roy on one occasion being very anxious, from good reasons, to frighten away a small party, first flourished a cutlass near them, at which they only laughed; he then twice fired his pistol close to a native. The man both times looked astounded, and carefully but quickly rubbed his head; he then stared awhile, and gabbled to his companions, but he never seemed to think of running away. We can hardly put ourselves in the position of these savages, and understand their actions. In the case of this Fuegian, the possibility of such a sound as the report of a gun close to his ear could never have entered his mind. He perhaps literally did not for a second know whether it was a sound or a blow, and therefore very naturally rubbed his head. In a similar manner, when a savage sees a mark struck by a bullet, it may be some time before he is able at all to understand how it is effected; for the fact of a body being invisible from its velocity would perhaps be to him an idea totally inconceivable. Moreover, the extreme force of a bullet, that penetrates a hard substance without tearing it, may convince the savage that it has no force at all. Certainly I believe that many savages of the lowest grade, such as these of Tierra del Fuego, have seen objects struck, and even small animals killed

by the musket, without being in the least aware how deadly an instrument it is.

22nd.—After having passed an unmolested night, in what would appear to be neutral territory between Jemmy's tribe and the people whom we saw yesterday, we sailed pleasantly along. I do not know anything which shows more clearly the hostile state of the different tribes, than these wide border or neutral tracts. Although Jemmy Button well knew the force of our party, he was, at first, unwilling to land amidst the hostile tribe nearest to his own. He often told us how the savage Oens men "when the leaf red," crossed the mountains from the eastern coast of Tierra del Fuego, and made inroads on the natives of this part of the country. It was most curious to watch him when thus talking, and see his eyes gleaming and his whole face assume a new and wild expression. As we proceeded along the Beagle Channel, the scenery assumed a peculiar and very magnificent character; but the effect was much lessened from the lowness of the point of view in a boat, and from looking along the valley, and thus losing all the beauty of a succession of ridges. The mountains were here about three thousand feet high, and terminated in sharp and jagged points. They rose in one unbroken sweep from the water's edge, and were covered to the height of fourteen or fifteen hundred feet by the dusky-coloured forest. It was most curious to observe, as far as the eye could range, how level and truly horizontal the line on the mountain side was, at which trees ceased to grow: it precisely resembled the high-water mark of drift-weed on a sea-beach.

At night we slept close to the junction of Ponsonby Sound with the Beagle Channel. A small family of Fuegians, who were living in the cove, were quiet and inoffensive, and soon joined our party round a blazing fire. We were well clothed, and though sitting close to the fire were far from too warm; yet these naked savages, though further off, were observed, to our great surprise, to be streaming with perspiration at undergoing such a roasting. They seemed, however, very well pleased, and all joined in the chorus of the seamen's songs: but the manner in which they were invariably a little behindhand was quite ludicrous.

During the night the news had spread, and early in

the morning (23rd) a fresh party arrived, belonging to the Tekenika, or Jemmy's tribe. Several of them had run so fast that their noses were bleeding, and their mouths frothed from the rapidity with which they talked; and with their naked bodies all bedaubed with black, white,¹ and red, they looked like so many demoniacs who had been fighting. We then proceeded (accompanied by twelve canoes, each holding four or five people) down Ponsonby Sound to the spot where poor Jemmy expected to find his mother and relatives. He had already heard that his father was dead; but as he had had a "dream in his head" to that effect, he did not seem to care much about it, and repeatedly comforted himself with the very natural reflection—"Me no help it." He was not able to learn any particulars regarding his father's death, as his relations would not speak about it.

Jemmy was now in a district well known to him, and guided the boats to a quiet pretty cove named Woollya, surrounded by islets, every one of which and every point had its proper native name. We found here a family of Jemmy's tribe, but not his relations: we made friends with them; and in the evening they sent a canoe to inform Jemmy's mother and brothers. The cove was bordered by some acres of good sloping land, not covered (as elsewhere) either by peat or by forest-trees. Captain Fitz Roy originally intended, as before stated, to have taken York Minster and Fuegia to their own tribe on the west coast; but as they expressed a wish to remain here, and as the spot was singularly favourable, Captain Fitz Roy determined to settle here the whole party, including Matthews, the missionary. Five days were spent in building for them three large wigwams, in landing their goods, in digging two gardens, and sowing seeds.

The next morning after our arrival (the 24th) the Fuegians began to pour in, and Jemmy's mother and brothers arrived. Jemmy recognized the stentorian voice of one of his brothers at a prodigious distance. The meeting was less interesting than that between a horse,

¹ This substance, when dry, is tolerably compact, and of little specific gravity: Professor Ehrenberg has examined it: he states (König Akad. der Wissen: Berlin, Feb. 1845) that it is composed of infusoria, including fourteen polygastrica, and four phytolitharia. He says that they are all inhabitants of fresh-water; this is a beautiful example of the results obtainable through Professor Ehrenberg's microscopic researches; for Jemmy Button told me that it is always collected at the bottoms of mountain-brooks. It is, moreover, a striking fact in the geographical distribution of the infusoria, which are well known to have very wide ranges, that all the species in this substance, although brought from the extreme southern point of Tierra del Fuego, are old, known forms.

turned out into a field, when he joins an old companion. There was no demonstration of affection; they simply stared for a short time at each other; and the mother immediately went to look after her canoe. We heard, however, through York, that the mother had been inconsolable for the loss of Jemmy, and had searched everywhere for him, thinking that he might have been left after having been taken in the boat. The women took much notice of and were very kind to Fuegia. We had already perceived that Jemmy had almost forgotten his own language. I should think there was scarcely another human being with so small a stock of language, for his English was very imperfect. It was laughable, but almost pitiable, to hear him speak to his wild brother in English, and then ask him in Spanish ("no sabe?") whether he did not understand him.

Everything went on peaceably during the three next days, whilst the gardens were digging and wigwams building. We estimated the number of natives at about one hundred and twenty. The women worked hard, whilst the men lounged about all day long, watching us. They asked for everything they saw, and stole what they could. They were delighted at our dancing and singing, and were particularly interested at seeing us wash in a neighbouring brook; they did not pay much attention to anything else, not even to our boats. Of all the things which York saw, during his absence from his country, nothing seems more to have astonished him than an ostrich, near Maldonado: breathless with astonishment he came running to Mr. Bynoe, with whom he was out walking—"Oh, Mr. Bynoe, oh, bird all same horse!" Much as our white skins surprised the natives, by Mr. Low's account a negro-cook to a sealing vessel, did so more effectually; and the poor fellow was so mobbed and shouted at that he would never go on shore again. Everything went on so quietly, that some of the officers and myself took long walks in the surrounding hills and woods. Suddenly, however, on the 27th, every woman and child disappeared. We were all uneasy at this, as neither York nor Jemmy could make out the cause. It was thought by some that they had been frightened by our cleaning and firing off our muskets on the previous evening: by others, that it was owing to offence taken by an old savage, who, when told to keep

further off, had coolly spit in the sentry's face, and had then, by gestures acted over a sleeping Fuegian, plainly showed, as it was said, that he should like to cut up and eat our man. Captain Fitz Roy, to avoid the chance of an encounter, which would have been fatal to so many of the Fuegians, thought it advisable for us to sleep at a cove a few miles distant. Matthews, with his usual quiet fortitude (remarkable in a man apparently possessing little energy of character), determined to stay with the Fuegians, who evinced no alarm for themselves; and so we left them to pass their first awful night.

On our return in the morning (28th) we were delighted to find all quiet, and the men employed in their canoes spearing fish. Captain Fitz Roy determined to send the yawl and one whale-boat back to the ship; and to proceed with the two other boats, one under his own command (in which he most kindly allowed me to accompany him), and one under Mr. Hammond, to survey the western parts of the Beagle Channel, and afterwards to return and visit the settlement. The day to our astonishment was over-poweringly hot, so that our skins were scorched: with this beautiful weather, the view in the middle of the Beagle Channel was very remarkable. Looking towards either hand, no object intercepted the vanishing points of this long canal between the mountains. The circumstance of its being an arm of the sea was rendered very evident by several huge whales¹ spouting in different directions. On one occasion I saw two of these monsters, probably male and female, slowly swimming one after the other, within less than a stone's throw of the shore, over which the beech-tree extended its branches.

We sailed on till it was dark, and then pitched our tents in a quiet creek. The greatest luxury was to find for our beds a beach of pebbles, for they were dry and yielded to the body. Peaty soil is damp; rock is uneven and hard; sand gets into one's meat, when cooked and eaten boat-fashion; but when lying in our blanket-bags, on a good bed of smooth pebbles, we passed most comfortable nights.

It was my watch till one o'clock. There is something very solemn in these scenes. At no time does the con-

¹ One day, off the East coast of Tierra del Fuego, we saw a grand sight in several spermaceti whales jumping upright quite out of the water, with the exception of their tail-fins. As they fell down sideways, they splashed the water high up, and the sound reverberated like a distant broadside.

sciousness in what a remote corner of the world you are then standing, come so strongly before the mind. Everything tends to this effect; the stillness of the night is interrupted only by the heavy breathing of the seamen beneath the tents, and sometimes by the cry of a night-bird. The occasional barking of a dog, heard in the distance, reminds one that it is the land of the savage.

January 29th.—Early in the morning we arrived at the point where the Beagle Channel divides into two arms; and we entered the northern one. The scenery here becomes even grander than before. The lofty mountains on the north side compose the granitic axis, or backbone of the country, and boldly rise to a height of between three and four thousand feet, with one peak above six thousand feet. They are covered by a wide mantle of perpetual snow, and numerous cascades pour their waters, through the woods, into the narrow channel below. In many parts, magnificent glaciers extend from the mountain side to the water's edge. It is scarcely possible to imagine any thing more beautiful than the beryl-like blue of these glaciers, and especially as contrasted with the dead white of the upper expanse of snow. The fragments which had fallen from the glacier into the water, were floating away, and the channel with its icebergs presented, for the space of a mile, a miniature likeness of the Polar Sea. The boats being hauled on shore at our dinner-hour, we were admiring from the distance of half a mile a perpendicular cliff of ice, and were wishing that some more fragments would fall. At last, down came a mass with a roaring noise, and immediately we saw the smooth outline of a wave travelling towards us. The men ran down as quickly as they could to the boats; for the chance of their being dashed to pieces was evident. One of the seamen just caught hold of the bows, as the curling breaker reached it: he was knocked over and over, but not hurt; and the boats, though thrice lifted on high and let fall again, received no damage. This was most fortunate for us, for we were a hundred miles distant from the ship, and we should have been left without provisions or fire-arms. I had previously observed that some large fragments of rock on the beach had been lately displaced; but until seeing this wave, I did not understand the cause. One side of the creek was formed by a spur of mica-slate; the head by a cliff

of ice about forty feet high; and the other side by a promontory fifty feet high, built up of huge rounded fragments of granite and mica-slate, out of which old trees were growing. This promontory was evidently a moraine, heaped up at a period when the glacier had greater dimensions.

When we reached the western mouth of this northern branch of the Beagle Channel we sailed amongst many unknown desolate islands, and the weather was wretchedly bad. We met with no natives. The coast was almost everywhere so steep, that we had several times to pull many miles before we could find space enough to pitch our two tents: one night we slept on large round boulders, with putrefying sea-weed between them; and when the tide rose, we had to get up and move our blanket-bags. The farthest point westward which we reached was Stewart Island, a distance of about one hundred and fifty miles from our ship. We returned into the Beagle Channel by the southern arm, and thence proceeded, with no adventure, back to Ponsonby Sound.

February 6th.—We arrived at Woollya. Matthews gave so bad an account of the conduct of the Fuegians, that Captain Fitz Roy determined to take him back to the *Beagle*; and ultimately he was left at New Zealand, where his brother was a missionary. From the time of our leaving, a regular system of plunder commenced; fresh parties of the natives kept arriving: York and Jemmy lost many things, and Matthews almost every thing which had not been concealed underground. Every article seemed to have been torn up and divided by the natives. Matthews described the watch he was obliged always to keep as most harassing; night and day he was surrounded by the natives, who tried to tire him out by making an incessant noise close to his head. One day an old man, whom Matthews asked to leave his wigwam, immediately returned with a large stone in his hand: another day a whole party came armed with stones and stakes, and some of the younger men and Jemmy's brother were crying: Matthews met them with presents. Another party showed by signs that they wished to strip him naked and pluck all the hairs out of his face and body. I think we arrived just in time to save his life. Jemmy's relatives had been so vain and foolish, that they had showed to strangers their plunder, and their manner of obtaining it. It was quite

melancholy leaving the three Fuegians with their savage countrymen; but it was a great comfort that they had no personal fears. York, being a powerful resolute man, was pretty sure to get on well, together with his wife Fuegia. Poor Jimmy looked rather disconsolate, and would then, I have little doubt, have been glad to have returned with us. His own brother had stolen many things from him; and as he remarked, "what fashion call that:" he abused his countrymen, "all bad men, no sabe (know) nothing," and, though I never heard him swear before, "damned fools." Our three Fuegians, though they had been only three years with civilized men, would, I am sure, have been glad to have retained their new habits; but this was obviously impossible. I fear it is more than doubtful, whether their visit will have been of any use to them.

In the evening, with Matthews on board, we made sail back to the ship, not by the *Beagle* Channel, but by the southern coast. The boats were heavily laden and the sea rough, and we had a dangerous passage. By the evening of the 7th we were on board the *Beagle* after an absence of twenty days, during which time we had gone three hundred miles in the open boats. On the 11th, Captain Fitz Roy paid a visit by himself to the Fuegians and found them going on well; and that they had lost very few more things.

On the last day of February in the succeeding year (1834), the *Beagle* anchored in a beautiful little cove at the eastern entrance of the *Beagle* Channel. Captain Fitz Roy determined on the bold, and as it proved successful, attempt to beat against the westerly winds by the same route, which we had followed in the boats to the settlement at Woollya. We did not see many natives until we were near Ponsonby Sound, where we were followed by ten or twelve canoes. The natives did not at all understand the reason of our tacking, and, instead of meeting us at each tack, vainly strove to follow us in our zig-zag course. I was amused at finding what a difference the circumstance of being quite superior in force made, in the interest of beholding these savages. While in the boats I got to hate the very sound of their voices, so much trouble did they give us. The first and last word was "yammerschooner." When, entering some quiet little cove, we have looked round and thought to pass a quiet night, the odious word

"yammerschooner" has shrilly sounded from some gloomy nook, and then the little signal-smoke has curled up to spread the news far and wide. On leaving some place we have said to each other, "Thank Heaven, we have at last fairly left these wretches!" when one more faint halloo from an all-powerful voice, heard at a prodigious distance, would reach our ears, and clearly could we distinguish—"yammerschooner." But now, the more Fuegians the merrier; and very merry work it was. Both parties laughing, wondering, gaping at each other; we pitying them, for giving us good fish and crabs for rags, &c.; they grasping at the chance of finding people so foolish as to exchange such splendid ornaments for a good supper. It was most amusing to see the undisguised smile of satisfaction with which one young woman with her face painted black, tied several bits of scarlet cloth round her head with rushes. Her husband, who enjoyed the very universal privilege in this country of possessing two wives, evidently became jealous of all the attention paid to his young wife; and, after a consultation with his naked beauties, was paddled away by them.

Some of the Fuegians plainly showed that they had a fair notion of barter. I gave one man a large nail (a most valuable present) without making any signs for a return; but he immediately picked out two fish, and handed them up on the point of his spear. If any present was designed for one canoe, and it fell near another, it was invariably given to the right owner. The Fuegian boy, whom Mr. Low had on board, showed, by going into the most violent passion, that he quite understood the reproach of being called a liar, which in truth he was. We were this time, as on all former occasions, much surprised at the little notice, or rather none whatever, which was taken of many things, the use of which must have been evident to the natives. Simple circumstances—such as the beauty of scarlet cloth or blue beads, the absence of women, our care in washing ourselves,—excited their admiration far more than any grand or complicated object, such as our ship. Bougainville has well remarked concerning these people, that they treat the "chef-d'œuvres de l'industrie humaine, comme ils traitent les loix de la nature et ses phénomènes."

On the 5th of March, we anchored in the cove at Woollya, but we saw not a soul there. We were alarmed

at this, for the natives in Ponsonby Sound showed by gestures, that there had been fighting; and we afterwards heard that the dreaded Oens men had made a descent. Soon a canoe, with a little flag flying, was seen approaching, with one of the men in it washing the paint off his face. This man was poor Jemmy,—now a thin haggard savage, with long disordered hair, and naked, except a bit of a blanket round his waist. We did not recognize him till he was close to us; for he was ashamed of himself, and turned his back to the ship. We had left him plump, fat, clean, and well dressed;—I never saw so complete and grievous a change. As soon however as he was clothed, and the first flurry was over, things wore a good appearance. He dined with Captain Fitz Roy, and ate his dinner as tidily as formerly. He told us he had “too much” (meaning enough) to eat, that he was not cold, that his relations were very good people, and that he did not wish to go back to England: in the evening we found out the cause of this great change in Jemmy’s feelings, in the arrival of his young and nice-looking wife. With his usual good feeling, he brought two beautiful otter-skins for two of his best friends, and some spear-heads and arrows made with his own hands for the Captain. He said he had built a canoe for himself, and he boasted that he could talk a little of his own language! But it is a most singular fact, that he appears to have taught all his tribe some English: an old man spontaneously announced “Jemmy Button’s wife.” Jemmy had lost all his property. He told us that York Minster had built a large canoe, and with his wife Fuegia,¹ had several months since gone to his own country, and had taken farewell by an act of consummate villainy; he persuaded Jemmy and his mother to come with him, and then on the way deserted them by night, stealing every article of their property.

Jemmy went to sleep on shore, and in the morning returned, and remained on board till the ship got under weigh, which frightened his wife, who continued crying violently till he got into his canoe. He returned loaded with valuable property. Every soul on board was heartily sorry to shake hands with him for the last

¹ Captain Sullivan, who, since his voyage in the *Beagle*, has been employed on the survey of the Falkland Islands, heard from a sealer in 1842 (?), that when in the western part of the Strait of Magellan, he was astonished by a native woman coming on board, who could talk some English. Without doubt this was Fuegia Basket. She lived (I fear the term probably bears a double interpretation) some days on board.

time. I do not now doubt that he will be as happy as, perhaps happier than, if he had never left his own country. Every one must sincerely hope that Captain Fitz Roy’s noble hope may be fulfilled, of being rewarded for the many generous sacrifices which he made for these Fuegians, by some shipwrecked sailor being protected by the descendants of Jemmy Button and his tribe! When Jemmy reached the shore, he lighted a signal fire, and the smoke curled up, bidding us a last and long farewell, as the ship stood on her course into the open sea.

The perfect equality among the individuals composing the Fuegian tribes, must for a long time retard their civilization. As we see those animals, whose instinct compels them to live in society and obey a chief, are most capable of improvement, so is it with the races of mankind. Whether we look at it as a cause or a consequence, the more civilized always have the most artificial governments. For instance, the inhabitants of Otaheite, who, when first discovered, were governed by hereditary kings, had arrived at a far higher grade than another branch of the same people, the New Zealanders,—who, although benefited by being compelled to turn their attention to agriculture, were republicans in the most absolute sense. In Tierra del Fuego, until some chief shall arise with power sufficient to secure any acquired advantage, such as the domesticated animals, it seems scarcely possible that the political state of the country can be improved. At present, even a piece of cloth given to one is torn into shreds and distributed; and no one individual becomes richer than another. On the other hand, it is difficult to understand how a chief can arise till there is property of some sort by which he might manifest his superiority and increase his power.

I believe, in this extreme part of South America, man exists in a lower state of improvement than in any other part of the world. The South Sea Islanders of the two races inhabiting the Pacific, are comparatively civilized. The Esquimaux, in his subterranean hut, enjoys some of the comforts of life, and in his canoe, when fully equipped, manifests much skill. Some of the tribes of Southern Africa, prowling about in search of roots, and living concealed on the wild and arid plains, are sufficiently wretched. The Australian, in the simplicity of the arts of

life, comes nearest the Fuegian: he can, however, boast of his boomerang, his spear and throwing-stick, his method of climbing trees, of tracking animals, and of hunting. Although the Australian may be superior in acquirements, it by no means follows that he is likewise superior in mental capacity: indeed, from what I saw of the Fuegians when on board, and from what I have read of the Australians, I should think the case was exactly the reverse.

CHAPTER XI

STRAIT OF MAGELLAN.—CLIMATE OF THE SOUTHERN COASTS

Strait of Magellan—Port Famine—Ascent of Mount Tarn—Forests—Edible Fungus—Zoology—Great Sea-weed—Leave Tierra del Fuego—Climate—Fruit-trees and Productions of the Southern Coasts—Height of Snow-line on the Cordillera—Descent of Glaciers to the Sea—Icebergs formed—Transportal of Boulders—Climate and Productions of the Antarctic Islands—Preservation of Frozen Carcasses—Recapitulation.

In the end of May, 1834, we entered for the second time the eastern mouth of the Strait of Magellan. The country on both sides of this part of the Strait consists of nearly level plains, like those of Patagonia. Cape Negro, a little within the second Narrows, may be considered as the point where the land begins to assume the marked features of Tierra del Fuego. On the east coast, south of the Strait, broken park-like scenery in a like manner connects these two countries, which are opposed to each other in almost every feature. It is truly surprising to find in a space of twenty miles such a change in the landscape. If we take a rather greater distance, as between Port Famine and Gregory Bay, that is about sixty miles, the difference is still more wonderful. At the former place, we have rounded mountains concealed by impervious forests, which are drenched with the rain, brought by an endless succession of gales; while at Cape Gregory, there is a clear and bright blue sky over the dry and sterile plains. The atmospheric currents,¹ although rapid, turbulent, and unconfined by any apparent limits, yet seem to follow, like a river in its bed, a regularly determined course.

¹ The south-westerly breezes are generally very dry. January 20th, being at anchor under Cape Gregory: a very hard gale from W. by S., clear sky with few cumuli; temperature 57°, dew-point 36°,—difference, 21°. On January 15th, at Port St. Julian: in the morning light winds with much rain, followed by a very heavy squall with rain,—settled into heavy gale with large cumuli,—cleared up, blowing very strong from S.S.W. Temperature 60°, dew-point 42°,—difference 18°.

During our previous visit (in January), we had an interview at Cape Gregory with the famous so-called gigantic Patagonians, who gave us a cordial reception. Their height appears greater than it really is, from their large guanaco mantles, their long flowing hair, and general figure: on an average their height is about six feet, with some men taller and only a few shorter; and the women are also tall; altogether they are certainly the tallest race which we anywhere saw. In features they strikingly resemble the more northern Indians whom I saw with Rosas, but they have a wilder and more formidable appearance: their faces were much painted with red and black, and one man was ringed and dotted with white like a Fuegian. Capt. Fitz Roy offered to take any three of them on board, and all seemed determined to be of the three. It was long before we could clear the boat; at last we got on board with our three giants, who dined with the Captain, and behaved quite like gentlemen, helping themselves with knives, forks, and spoons: nothing was so much relished as sugar. This tribe has had so much communication with sealers and whalers, that most of the men can speak a little English and Spanish; and they are half civilized, and proportionally demoralised.

The next morning a large party went on shore, to barter for skins and ostrich-feathers; fire-arms being refused, tobacco was in greatest request, far more so than axes or tools. The whole population of the toldos, men, women, and children, were arranged on a bank. It was an amusing scene, and it was impossible not to like the so-called giants, they were so thoroughly good-humoured and unsuspecting: they asked us to come again. They seem to like to have Europeans to live with them; and old Maria, an important woman in the tribe, once begged Mr. Low to leave any one of his sailors with them. They spend the greater part of the year here; but in summer they hunt along the foot of the Cordillera: sometimes they travel as far as the Rio Negro, 750 miles to the north. They are well stocked with horses, each man having, according to Mr. Low, six or seven, and all the women, and even children, their own horse. In the time of Sarmiento (1580), these Indians had bows and arrows, now long since disused; they then also possessed some horses. This is a very curious fact, showing the extraordinarily rapid multiplication of horses in South America. The

horse was first landed at Buenos Ayres in 1537, and the colony being then for a time deserted, the horse ran wild;¹ in 1580, only forty-three years afterwards, we hear of them at the Strait of Magellan! Mr. Low informs me, that a neighbouring tribe of foot-Indians is now changing into horse-Indians: the tribe at Gregory Bay giving them their worn-out horses, and sending in winter a few of their best skilled men to hunt for them.

June 1st.—We anchored in the fine bay of Port Famine. It was now the beginning of winter, and I never saw a more cheerless prospect; the dusky woods, piebald with snow, could be only seen indistinctly through a drizzling hazy atmosphere. We were, however, lucky in getting two fine days. On one of these, Mount Sarmiento, a distant mountain 6800 feet high, presented a very noble spectacle. I was frequently surprised, in the scenery of Tierra del Fuego, at the little apparent elevation of mountains really lofty. I suspect it is owing to a cause which would not at first be imagined, namely, that the whole mass, from the summit to the water's edge, is generally in full view. I remember having seen a mountain, first from the Beagle Channel, where the whole sweep from the summit to the base was full in view, and then from Ponsonby Sound across several successive ridges; and it was curious to observe in the latter case, as each fresh ridge afforded fresh means of judging of the distance, how the mountain rose in height.

Before reaching Port Famine, two men were seen running along the shore and hailing the ship. A boat was sent for them. They turned out to be two sailors who had run away from a sealing-vessel, and had joined the Patagonians. These Indians had treated them with their usual disinterested hospitality. They had parted company through accident, and were then proceeding to Port Famine in hopes of finding some ship. I dare say they were worthless vagabonds, but I never saw more miserable-looking ones. They had been living for some days on mussel-shells and berries, and their tattered clothes had been burnt by sleeping so near their fires. They had been exposed night and day, without any shelter, to the late incessant gales, with rain, sleet, and snow, and yet they were in good health.

During our stay at Port Famine, the Fuegians twice

¹ Rengger, Natur. der Saeugthiere von Paraguay. S. 334.

came and plagued us. As there were many instruments, clothes, and men on shore, it was thought necessary to frighten them away. The first time a few great guns were fired, when they were far distant. It was most ludicrous to watch through a glass the Indians, as often as the shot struck the water, take up stones, and as a bold defiance, throw them towards the ship, though about a mile and a half distant! A boat was then sent with orders to fire a few musket-shots wide of them. The Fuegians hid themselves behind the trees, and for every discharge of the muskets they fired their arrows; all, however, fell short of the boat, and the officer as he pointed at them laughed. This made the Fuegians frantic with passion, and they shook their mantles in vain rage. At last, seeing the balls cut and strike the trees, they ran away, and we were left in peace and quietness. During the former voyage the Fuegians were here very troublesome, and to frighten them a rocket was fired at night over their wigwams: it answered effectually, and one of the officers told me that the clamour first raised, and the barking of the dogs, was quite ludicrous in contrast with the profound silence which in a minute or two afterwards prevailed. The next morning not a single Fuegian was in the neighbourhood.

When the *Beagle* was here in the month of February, I started one morning at four o'clock to ascend Mount Tarn, which is 2600 feet high, and is the most elevated point in this immediate district. We went in a boat to the foot of the mountain (but unluckily not to the best part), and then began our ascent. The forest commences at the line of high-water mark, and during the first two hours I gave over all hopes of reaching the summit. So thick was the wood, that it was necessary to have constant recourse to the compass; for every landmark, though in a mountainous country, was completely shut out. In the deep ravines, the death-like scene of desolation exceeded all description; outside it was blowing a gale, but in these hollows, not even a breath of wind stirred the leaves of the tallest trees. So gloomy, cold, and wet was every part, that not even the fungi, mosses, or ferns could flourish. In the valleys it was scarcely possible to crawl along, they were so completely barricaded by great mouldering trunks, which had fallen down in every direction. When passing over these natural bridges, one's

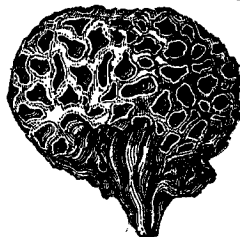
course was often arrested by sinking knee deep into the rotten wood; at other times, when attempting to lean against a firm tree, one was startled by finding a mass of decayed matter ready to fall at the slightest touch. We at last found ourselves among the stunted trees, and then soon reached the bare ridge, which conducted us to the summit. Here was a view characteristic of Tierra del Fuego; irregular chains of hills, mottled with patches of snow, deep yellowish-green valleys, and arms of the sea intersecting the land in many directions. The strong wind was piercingly cold, and the atmosphere rather hazy, so that we did not stay long on the top of the mountain. Our descent was not quite so laborious as our ascent; for the weight of the body forced a passage, and all the slips and falls were in the right direction.

I have already mentioned the sombre and dull character of the evergreen forests,¹ in which two or three species of trees grow, to the exclusion of all others. Above the forest land, there are many dwarf alpine plants, which all spring from the mass of peat, and help to compose it: these plants are very remarkable from their close alliance with the species growing on the mountains of Europe, though so many thousand miles distant. The central part of Tierra del Fuego, where the clay-slate formation occurs, is most favourable to the growth of trees; on the outer coast the poorer granitic soil, and a situation more exposed to the violent winds, do not allow of their attaining any great size. Near Port Famine I have seen more large trees than anywhere else: I measured a Winter's Bark which was four feet six inches in girth, and several of the beech were as much as thirteen feet. Captain King also mentions a beech which was seven feet in diameter seventeen feet above the roots.

There is one vegetable production deserving notice from its importance as an article of food to the Fuegians. It is a glabular, bright-yellow fungus, which grows in vast numbers on the beech-trees. When young it is elastic and turgid, with a smooth surface; but when mature, it

¹ Captain Fitz Roy informs me that in April (our October), the leaves of those trees which grow near the base of the mountains, change colour, but not those on the more elevated parts. I remember having read some observations, showing that in England the leaves fall earlier in a warm and fine autumn, than in a late and cold one. The change in the colour being here retarded in the more elevated, and therefore colder situations, must be owing to the same general law of vegetation. The trees of Tierra del Fuego during no part of the year entirely shed their leaves.

shrinks, becomes tougher, and has its entire surface deeply pitted or honey-combed, as represented in the accompanying wood-cut. This fungus belongs to a new and curious genus;¹ I found a second species on another species of beech in Chile; and Dr. Hooker informs me, that just lately a third species has been discovered on a third species of beech in Van Diemen's Land. How singular is this relationship between parasitical fungi and the trees on which they grow, in distant parts of the world! In Tierra del Fuego the fungus in its tough and mature



state is collected in large quantities by the women and children, and is eaten uncooked. It has a mucilaginous, slightly sweet taste, with a faint smell like that of a mushroom. With the exception of a few berries, chiefly of a dwarf arbutus, the natives eat no vegetable food besides this fungus. In New Zealand, before the introduction of the potato, the roots of the fern were largely consumed; at the present time, I believe, Tierra del Fuego is the only country in the world where a cryptogamic plant affords a staple article of food.

The zoology of Tierra del Fuego, as might have been expected from the nature of its climate and vegetation, is very poor. Of mammalia, besides whales and seals, there is one bat, a kind of mouse (*Reithrodon chinchilloides*), two true mice, a *ctenomys* allied to or identical with the *tucutuco*, two foxes (*Canis Magellanicus* and *C. Azaræ*), a sea-otter, the *guanaco*, and a deer. Most of these animals inhabit only the drier eastern parts of the country; and the deer has never been seen south of the Strait of Magellan. Observing the general correspondence of the cliffs of soft sandstone, mud, and shingle, on the opposite sides of the Strait, and on some intervening islands, one is strongly tempted to believe that the land was once joined, and thus allowed animals so delicate and helpless as the *tucutuco* and *Reithrodon* to pass over. The correspondence of the cliffs is far from proving any junction; because such

¹ Described from my specimens, and notes by the Rev. J. M. Berkeley, in the *Linnean Transactions* (vol. xix. p. 37), under the name of *Cyrtaria Darwinii*: the Chilean species is the *C. Berteroi*. This genus is allied to *Bulgaria*.

cliffs generally are formed by the intersection of sloping deposits, which, before the elevation of the land, had been accumulated near the then existing shores. It is, however, a remarkable coincidence, that in the two large islands cut off by the Beagle Channel from the rest of Tierra del Fuego, one has cliffs composed of matter that may be called stratified alluvium, which front similar ones on the opposite side of the channel,—while the other is exclusively bordered by old crystalline rocks: in the former, called Navarin Island, both foxes and guanacos occur; but in the latter, Hoste Island, although similar in every respect, and only separated by a channel a little more than half a mile wide, I have the word of Jemmy Button for saying, that neither of these animals are found.

The gloomy woods are inhabited by few birds: occasionally the plaintive note of a white-tufted tyrant-flycatcher (*Myiobius albiceps*) may be heard, concealed near the summit of the most lofty trees; and more rarely the loud strange cry of a black woodpecker, with a fine scarlet crest on its head. A little, dusky-coloured wren (*Scytalopus Magellanicus*) hops in a skulking manner among the entangled mass of the fallen and decaying trunks. But the creeper (*Oxyurus tupinieri*) is the commonest bird in the country. Throughout the beech forests, high up and low down, in the most gloomy, wet, and impenetrable ravines, it may be met with. This little bird no doubt appears more numerous than it really is, from its habit of following with seeming curiosity any person who enters these silent woods: continually uttering a harsh twitter, it flutters from tree to tree, within a few feet of the intruder's face. It is far from wishing for the modest concealment of the true creeper (*Certhia familiaris*); nor does it, like that bird, run up the trunks of trees, but industriously, after the manner of a willow-wren, hops about, and searches for insects on every twig and branch. In the more open parts, three or four species of finches, a thrush, a starling (or *Icterus*), two *Opetiorhynchi*, and several hawks and owls occur.

The absence of any species whatever in the whole class of Reptiles, is a marked feature in the zoology of this country, as well as in that of the Falkland Islands. I do not ground this statement merely on my own observation, but I heard it from the Spanish inhabitants of the latter place, and from Jemmy Button with regard to Tierra del

Fuego. On the banks of the Santa Cruz, in 50° south, I saw a frog; and it is not improbable that these animals, as well as lizards, may be found as far south as the Strait of Magellan, where the country retains the character of Patagonia; but within the damp and cold limit of Tierra del Fuego not one occurs. That the climate would not have suited some of the orders, such as lizards, might have been foreseen; but with respect to frogs, this was not so obvious.

Beetles occur in very small numbers: it was long before I could believe that a country as large as Scotland, covered with vegetable productions, and with a variety of stations, could be so unproductive. The few which I found were alpine species (*Harpalidæ* and *Heteromidæ*) living under stones. The vegetable-feeding *Chrysomelidæ*, so eminently characteristic of the Tropics, are here almost entirely absent;¹ I saw very few flies, butterflies, or bees, and no crickets or Orthoptera. In the pools of water I found but few aquatic beetles, and not any fresh-water shells: *Succinea* at first appears an exception; but here it must be called a terrestrial shell, for it lives on the damp herbage far from water. Land-shells could be procured only in the same alpine situations with the beetles. I have already contrasted the climate as well as the general appearance of Tierra del Fuego with that of Patagonia; and the difference is strongly exemplified in the entomology. I do not believe they have one species in common; certainly the general character of the insects is widely different.

If we turn from the land to the sea, we shall find the latter as abundantly stocked with living creatures as the former is poorly so. In all parts of the world a rocky and partially protected shore perhaps supports, in a given space, a greater number of individual animals than any other station. There is one marine production, which from its importance is worthy of a particular history. It is the kelp, or *Macrocystis pyrifera*. This plant grows on every rock from low-water mark to a great depth, both on the outer coast and within the channels.² I believe,

¹ I believe I must except one alpine *Haltica*, and a single specimen of a *Melasoma*. Mr. Waterhouse informs me, that of the *Harpalidæ* there are eight or nine species—the forms of the greater number being very peculiar; of *Heteromera*, four or five species; of *Rhyncophora* six or seven; and of the following families one species in each: *Staphylinidæ*, *Elateridæ*, *Cebionidæ*, *Melolonthidæ*. The species in the other orders are even fewer. In all the orders, the scarcity of the individuals is even more remarkable than that of the species. Most of the Coleoptera have been carefully described by Mr. Waterhouse in the *Annals of Nat. Hist.*

² Its geographical range is remarkably wide; it is found from the extreme southern islets near Cape Horn, as far north on the eastern coast (according to information given

during the voyages of the *Adventure* and *Beagle*, not one rock near the surface was discovered which was not buoyed by this floating weed. The good service it thus affords to vessels navigating near this stormy land is evident; and it certainly has saved many a one from being wrecked. I know few things more surprising than to see this plant growing and flourishing amidst those great breakers of the western ocean, which no mass of rock, let it be ever so hard, can long resist. The stem is round, slimy, and smooth, and seldom has a diameter of so much as an inch. A few taken together are sufficiently strong to support the weight of the large loose stones, to which in the inland channels they grow attached; and yet some of these stones were so heavy that when drawn to the surface, they could scarcely be lifted into a boat by one person. Captain Cook, in his second voyage, says, that this plant at Kerguelen Land rises from a greater depth than twenty-four fathoms; "and as it does not grow in a perpendicular direction, but makes a very acute angle with the bottom, and much of it afterwards spreads many fathoms on the surface of the sea, I am well warranted to say that some of it grows to the length of sixty fathoms and upwards." I do not suppose the stem of any other plant attains so great a length as three hundred and sixty feet, as stated by Captain Cook. Captain Fitz Roy, moreover, found it growing ¹ up from the greater depth of forty-five fathoms. The beds of this sea-weed, even when of not great breadth, make excellent natural floating breakwaters. It is quite curious to see, in an exposed harbour, how soon the waves from the open sea, as they travel through the straggling stems, sink in height, and pass into smooth water.

The number of living creatures of all Orders, whose existence intimately depends on the kelp, is wonderful. A great volume might be written, describing the inhabitants of one of these beds of sea-weed. Almost all the leaves, excepting those that float on the surface, are so thickly incrustated with corallines as to be of a white colour. We

me by Mr. Stokes) as lat. 43°,—but on the western coast, as Dr. Hooker tells me, it extends to the R. San Francisco in California, and perhaps even to Kamtschatka. We thus have an immense range in latitude; and as Cook, who must have been well acquainted with the species, found it at Kerguelen Land, no less than 140° in longitude.

¹ Voyages of the *Adventure* and *Beagle*, vol. i. p. 363.—It appears that sea-weed grows extremely quick. Mr. Stephenson found (Wilson's Voyage round Scotland, vol. ii. p. 228) that a rock uncovered only at spring-tides, which had been chiselled smooth in November, on the following May, that is within six months afterwards, was thickly covered with *Fucus digitatus* two feet, and *F. esculentus* six feet, in length.

find exquisitely delicate structures, some inhabited by simple hydra-like polypi, others by more organized kinds, and beautiful compound Ascidiæ. On the leaves, also, various patelliform shells, Trochi, uncovered molluscs, and some bivalves are attached. Innumerable crustacea frequent every part of the plant. On shaking the great entangled roots, a pile of small fish, shells, cuttle-fish, crabs of all orders, sea-eggs, star-fish, beautiful Holothuriæ, Planariæ, and crawling nereidous animals of a multitude of forms, all fall out together. Often as I recurred to a branch of the kelp, I never failed to discover animals of new and curious structures. In Chiloe, where the kelp does not thrive very well, the numerous shells, corallines, and crustacea are absent; but there yet remain a few of the Flustraceæ, and some compound Ascidiæ; the latter, however, are of different species from those in Tierra del Fuego: we here see the fucus possessing a wider range than the animals which use it as an abode. I can only compare these great aquatic forests of the southern hemisphere, with the terrestrial ones in the inter-tropical regions. Yet if in any country a forest was destroyed, I do not believe nearly so many species of animals would perish as would here, from the destruction of the kelp. Amidst the leaves of this plant numerous species of fish live, which nowhere else could find food or shelter; with their destruction the many cormorants and other fishing birds, the otters, seals, and porpoises, would soon perish also; and lastly, the Fuegian savage, the miserable lord of this miserable land, would redouble his cannibal feast, decrease in numbers, and perhaps cease to exist.

June 8th.—We weighed anchor early in the morning and left Port Famine. Captain Fitz Roy determined to leave the Strait of Magellan by the Magdalen Channel, which had not long been discovered. Our course lay due south, down that gloomy passage which I have before alluded to, as appearing to lead to another and worse world. The wind was fair, but the atmosphere was very thick; so that we missed much curious scenery. The dark ragged clouds were rapidly driven over the mountains, from their summits nearly down to their bases. The glimpses which we caught through the dusky mass, were highly interesting; jagged points, cones of snow, blue glaciers,

strong outlines, marked on a lurid sky, were seen at different distances and heights. In the midst of such scenery we anchored at Cape Turn, close to Mount Sarmiento, which was then hidden in the clouds. At the base of the lofty and almost perpendicular sides of our little cove there was one deserted wigwam, and it alone reminded us that man sometimes wandered into these desolate regions. But it would be difficult to imagine a scene where he seemed to have fewer claims or less authority. The inanimate works of nature—rock, ice, snow, wind, and water—all warring with each other, yet combined against man—here reigned in absolute sovereignty.

June 9th.—In the morning we were delighted by seeing the veil of mist gradually rise from Sarmiento, and display it to our view. This mountain, which is one of the highest in Tierra del Fuego, has an altitude of 6800 feet. Its base, for about an eighth of its total height, is clothed by dusky woods, and above this a field of snow extends to the summit. These vast piles of snow, which never melt, and seem destined to last as long as the world holds together, present a noble and even sublime spectacle. The outline of the mountain was admirably clear and defined. Owing to the abundance of light reflected from the white and glittering surface, no shadows were cast on any part; and those lines which intersected the sky could alone be distinguished: hence the mass stood out in the boldest relief. Several glaciers descended in a winding course from the upper great expanse of snow to the sea-coast: they may be likened to great frozen Niagaras; and perhaps these cataracts of blue ice are full as beautiful as the moving ones of water. By night we reached the western part of the channel; but the water was so deep that no anchorage could be found. We were in consequence obliged to stand off and on in this narrow arm of the sea, during a pitch-dark night of fourteen hours long.

June 10th.—In the morning we made the best of our way into the open Pacific. The Western coast generally consists of low, rounded, quite barren hills of granite and greenstone. Sir J. Narborough called one part South Desolation, because it is "so desolate a land to behold:" and well indeed might he say so. Outside the main islands, there are numberless scattered rocks on which the long swell of the open ocean incessantly rages. We passed out between the East and West Furies; and a little farther

northward there are so many breakers that the sea is called the Milky Way. One sight of such a coast is enough to make a landsman dream for a week about shipwrecks, peril, and death; and with this sight we bade farewell for ever to Tierra del Fuego.

The following discussion on the climate of the southern parts of the continent with relation to its productions, on the snow-line, on the extraordinarily low descent of the glaciers, and on the zone of perpetual congelation in the antarctic islands, may be passed over by any one not interested in these curious subjects, or the final recapitulation alone may be read. I shall, however, here give only an abstract, and must refer for details to the Thirteenth Chapter and the Appendix of the former edition of this work.

On the Climate and Productions of Tierra del Fuego and of the South-west Coast.—The following table gives the mean temperature of Tierra del Fuego, the Falkland Islands, and, for comparison, that of Dublin:—

	Latitude.	Summer Temp.	Winter Temp.	Mean of Summer and Winter.
Tierra del Fuego . . .	53° 38' S.	50°	33°.08	41°.54
Falkland Islands . . .	51° 39' S.	51°	—	—
Dublin	53° 21' N.	59.54	39.2	49.37

Hence we see that the central part of Tierra del Fuego is colder in winter, and no less than $9\frac{1}{2}^{\circ}$ less hot in summer, than Dublin. According to Von Buch the mean temperature of July (not the hottest month in the year) at Saltenfiord in Norway, is as high as $57^{\circ}.8$, and this place is actually 13° nearer the pole than Port Famine!¹ Inhospitable as this climate appears to our feelings, evergreen trees flourish luxuriantly under it. Humming-birds may be seen sucking the flowers, and parrots feeding on the seeds of the Winter's Bark, in lat. 55° S. I have already remarked to what a degree the sea swarms with living creatures; and the shells (such as the Patellæ, Fissurellæ, Chitons, and Barnacles), according to Mr. G. B. Sowerby, are of a much larger size, and of a more vigorous growth, than the analogous species in the northern hemi-

¹ With respect to Tierra del Fuego, the results are deduced from the observations by Capt. King (Geographical Journal, 1830), and those taken on board the *Beagle*. For the Falkland Islands, I am indebted to Capt. Sullivan for the mean of the mean temperature (reduced from careful observation at midnight, 8 A.M., noon, and 8 P.M.) of the three hottest months, viz. December, January, and February. The temperature of Dublin is taken from Barton.

sphere. A large *Voluta* is abundant in southern Tierra del Fuego and the Falkland Islands. At Bahia Blanca, in lat. 39° S., the most abundant shells were three species of *Oliva* (one of large size), one or two *Volutas*, and a *Terebra*. Now these are amongst the best characterized tropical forms. It is doubtful whether even one small species of *Oliva* exists on the southern shores of Europe, and there are no species of the two other genera. If a geologist were to find in lat. 39° on the coast of Portugal, a bed containing numerous shells belonging to three species of *Oliva*, to a *Voluta* and *Terebra*, he would probably assert that the climate at the period of their existence must have been tropical; but judging from South America, such an inference might be erroneous.

The equable, humid, and windy climate of Tierra del Fuego extends, with only a small increase of heat, for many degrees along the west coast of the continent. The forests, for 600 miles northward of Cape Horn, have a very similar aspect. As a proof of the equable climate, even for 300 or 400 miles still further northward, I may mention that in Chiloe (corresponding in latitude with the northern parts of Spain) the peach seldom produces fruit, whilst strawberries and apples thrive to perfection. Even the crops of barley and wheat¹ are often brought into the houses to be dried and ripened. At Valdivia (in the same latitude of 40°, with Madrid) grapes and figs ripen, but are not common; olives seldom ripen even partially, and oranges not at all. These fruits, in corresponding latitudes in Europe, are well known to succeed to perfection; and even in this continent, at the Rio Negro, under nearly the same parallel with Valdivia, sweet potatoes (*convolvulus*) are cultivated; and grapes, figs, olives, oranges, water and musk melons, produce abundant fruit. Although the humid and equable climate of Chiloe, and of the coast northward and southward of it, is so unfavourable to our fruits, yet the native forests, from lat. 45° to 38°, almost rival in luxuriance those of the glowing intertropical regions. Stately trees of many kinds, with smooth and highly coloured barks, are loaded by parasitical monocotyledonous plants; large and elegant ferns are numerous, and arborescent grasses intertwine the trees into one entangled mass to the height of thirty or forty feet above the ground. Palm-trees grow in lat. 37°; an arborescent

¹ Agüeros, *Descrip. Hist. de la Prov. de Chiloe*, 1791, p. 94.

grass, very like a bamboo, in 40°; and another closely allied kind, of great length, but not erect, flourishes even as far south as 45° S.

An equable climate, evidently due to the large area of sea compared with the land, seems to extend over the greater part of the southern hemisphere; and as a consequence, the vegetation partakes of a semi-tropical character. Tree-ferns thrive luxuriantly in Van Diemen's Land (lat. 45°), and I measured one trunk no less than six feet in circumference. An arborescent fern was found by Forster in New Zealand in 46°, where orchideous plants are parasitical on the trees. In the Auckland Islands, ferns, according to Dr. Dieffenbach,¹ have trunks so thick and high that they may be almost called tree-ferns; and in these islands, and even as far south as lat. 55° in the Macquarrie Islands, parrots abound.

On the Height of the Snow-line, and on the Descent of the Glaciers, in South America.—For the detailed authorities for the following table, I must refer to the former edition:—

Latitude.	Height in feet of Snow-line.	Observer.
Equatorial region; mean result	15,748	Humboldt.
Bolivia, lat. 16° to 18° S. . . .	17,000	Pentland.
Central Chile, lat. 33° S. . . .	14,500 to 15,000	Gillies, and the Author.
Chiloe, lat. 41° to 43° S. . . .	6,000	Officers of the <i>Beagle</i> , and the Author.
Tierra del Fuego, 54° S. . . .	3,500 to 4,000	King.

As the height of the plane of perpetual snow seems chiefly to be determined by the extreme heat of the summer, rather than by the mean temperature of the year, we ought not to be surprised at its descent in the Strait of Magellan, where the summer is so cool, to only 3500 or 4000 feet above the level of the sea; although in Norway, we must travel to between lat. 67° and 70° N., that is, about 14° nearer the pole, to meet with perpetual snow at this low level. The difference in height, namely, about 9000 feet, between the snow-line on the Cordillera behind Chiloe (with its highest points ranging from only 5600 to 7500 feet) and in central Chile² (a distance of only 9° of latitude), is truly wonderful. The land from the southward

¹ See the German Translation of this Journal: and for the other facts Mr. Brown's Appendix to Flinders's Voyage.

² On the Cordillera of central Chile, I believe the snowline varies exceedingly in height in different summers. I was assured that during one very dry and long summer, all the snow disappeared from Aconcagua, although it attains the prodigious height of 23,000 feet. It is probable that much of the snow at these great heights is evaporated, rather than thawed.

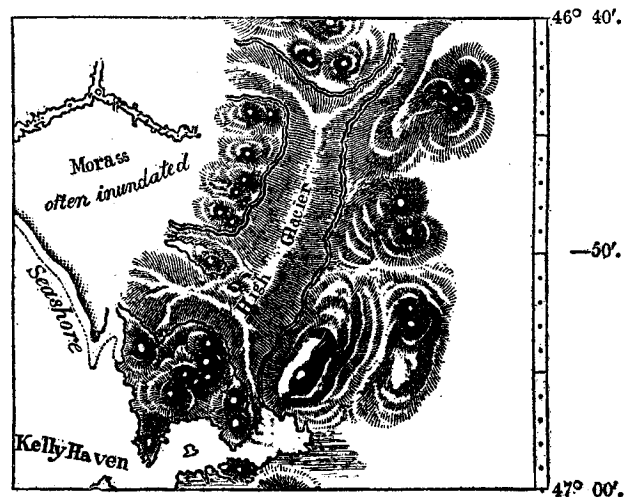
of Chiloe to near Concepcion (lat. 37°), is hidden by one dense forest dripping with moisture. The sky is cloudy, and we have seen how badly the fruits of southern Europe succeed. In central Chile, on the other hand, a little northward of Concepcion, the sky is generally clear, rain does not fall for the seven summer months, and southern European fruits succeed admirably; and even the sugar-cane has been cultivated.¹ No doubt the plane of perpetual snow undergoes the above remarkable flexure of 9000 feet, unparalleled in other parts of the world, not far from the latitude of Concepcion, where the land ceases to be covered with forest-trees; for trees in South America indicate a rainy climate, and rain a clouded sky and little heat in summer.

The descent of glaciers to the sea must, I conceive, mainly depend (subject, of course, to a proper supply of snow in the upper region) on the lowness of the line of perpetual snow on steep mountains near the coast. As the snow-line is so low in Tierra del Fuego, we might have expected that many of the glaciers would have reached the sea. Nevertheless I was astonished when I first saw a range, only from 3000 to 4000 feet in height, in the latitude of Cumberland, with every valley filled with streams of ice descending to the sea-coast. Almost every arm of the sea, which penetrates to the interior higher chain, not only in Tierra del Fuego, but on the coast for 650 miles northwards, is terminated by "tremendous and astonishing glaciers," as described by one of the officers on the survey. Great masses of ice frequently fall from these icy cliffs, and the crash reverberates like the broadside of a man-of-war, through the lonely channels. These falls, as noticed in the last chapter, produce great waves which break on the adjoining coasts. It is known that earthquakes frequently cause masses of earth to fall from sea-cliffs: how terrific, then, would be the effect of a severe shock (and such occur here²) on a body like a glacier, already in motion, and traversed by fissures! I can readily believe that the water would be fairly beaten back out of the deepest channel, and then returning with an overwhelming force, would whirl about huge masses of rock

¹ Miers's Chile, vol. i. p. 475. It is said that the sugar-cane grew at Ingenio, lat. 32° to 33° , but not in sufficient quantity to make the manufacture profitable. In the valley of Quillota, south of Ingenio, I saw some large date palm-trees.

² Bulkeley's and Cummin's Faithful Narrative of the Loss of the *Wager*. The earthquake happened August 25, 1741.

like so much chaff. In Eyre's Sound, in the latitude of Paris, there are immense glaciers, and yet the loftiest neighbouring mountain is only 6200 feet high. In this Sound, about fifty icebergs were seen at one time floating outwards, and one of them must have been at least 168



feet in total height. Some of the icebergs were loaded with blocks of no inconsiderable size, of granite and other rocks, different from the clay-slate of the surrounding mountains. The glacier furthest from the Pole, surveyed during the voyages of the *Adventure* and *Beagle*, is in lat. $46^{\circ} 50'$, in the Gulf of Penas. It is 15 miles long, and in one part 7 broad, and descends to the sea-coast. But even a few miles northward of this glacier, in the Laguna de San Rafael, some Spanish missionaries¹ encountered "many icebergs, some great, some small, and others middle-sized," in a narrow arm of the sea, on the 22nd of the month corresponding with our June, and in a latitude corresponding with that of the Lake of Geneva!

In Europe, the most southern glacier which comes down to the sea is met with, according to Von Buch, on the coast of Norway, in lat. 67° . Now this is more than 20° of latitude, or 1230 miles, nearer the pole than the Laguna

¹ Agüeros, Desc. Hist. de Chiloe, p. 227.

de San Rafael. The position of the glaciers at this place and in the Gulf of Penas, may be put even in a more striking point of view, for they descend to the sea-coast, within $7\frac{1}{2}^{\circ}$ of latitude, or 450 miles, of a harbour, where three species of *Oliva*, a *Voluta*, and a *Terebra*, are the commonest shells, within less than 9° from where palms grow, within $4\frac{1}{2}^{\circ}$ of a region where the jaguar and puma range over the plains, less than $2\frac{1}{2}^{\circ}$ from arborescent grasses, and (looking to the westward in the same hemisphere) less than 2° from orchideous parasites, and within a single degree of tree-ferns!

These facts are of high geological interest with respect to the climate of the northern hemisphere, at the period when boulders were transported. I will not here detail how simply the theory of icebergs being charged with fragments of rock, explains the origin and position of the gigantic boulders of eastern Tierra del Fuego, on the high plain of Santa Cruz, and on the island of Chiloe. In Tierra del Fuego, the greater number of boulders lie on the lines of old sea-channels, now converted into dry valleys by the elevation of the land. They are associated with a great unstratified formation of mud and sand, containing rounded and angular fragments of all sizes, which has originated¹ in the repeated ploughing up of the sea-bottom by the stranding of icebergs, and by the matter transported on them. Few geologists now doubt that those erratic boulders which lie near lofty mountains, have been pushed forward by the glaciers themselves, and that those distant from mountains, and embedded in subaqueous deposits, have been conveyed thither either on icebergs, or frozen in coast-ice. The connexion between the transportal of boulders and the presence of ice in some form, is strikingly shown by their geographical distribution over the earth. In South America they are not found further than 48° of latitude, measured from the southern pole; in North America it appears that the limit of their transportal extends to $53\frac{1}{2}^{\circ}$ from the northern pole; but in Europe to not more than 40° of latitude, measured from the same point. On the other hand, in the intertropical parts of America, Asia, and Africa, they have never been observed; nor at the Cape of Good Hope, nor in Australia.²

¹ Geological Transactions, vol. vi. p. 475.

² I have given details (the first, I believe, published) on this subject in the first edition, and in the Appendix to it. I have there shown that the apparent exceptions to the

On the Climate and Productions of the Antarctic Islands.
—Considering the rankness of the vegetation in Tierra del Fuego, and on the coast northward of it, the condition of the islands south and south-west of America is truly surprising. Sandwich Land, in the latitude of the north part of Scotland, was found by Cook, during the hottest month of the year, “covered many fathoms thick with everlasting snow;” and there seems to be scarcely any vegetation. Georgia, an island 96 miles long and 10 broad, in the latitude of Yorkshire, “in the very height of summer, is in a manner wholly covered with frozen snow.” It can boast only of moss, some tufts of grass, and wild burnet: it has only one land-bird (*Anthus correndera*), yet Iceland, which is 10° nearer the pole, has, according to Mackenzie, fifteen land-birds. The South Shetland Islands, in the same latitude as the southern half of Norway, possess only some lichens, moss, and a little grass; and Lieut. Kendall¹ found the bay, in which he was at anchor, beginning to freeze at a period corresponding with our 8th of September. The soil here consists of ice and volcanic ashes interstratified; and at a little depth beneath the surface it must remain perpetually congealed, for Lieut. Kendall found the body of a foreign sailor which had long been buried, with the flesh and all the features perfectly preserved. It is a singular fact, that on the two great continents in the northern hemisphere (but not in the broken land of Europe between them), we have the zone of perpetually frozen under-soil in a low latitude—namely, in 56° in North America at the depth of three feet,² and in 62° in Siberia at the depth of twelve to fifteen feet—as the result of a directly opposite condition of things, to those of the southern hemisphere. On the northern continents, the winter is rendered excessively cold by the radiation from a large area of land into a clear sky, nor is it moderated by the warmth-bringing currents of the sea; the short summer, on the other hand, is hot. In the Southern Ocean the winter is not so excessively cold, but the summer is far less hot, for the clouded sky seldom allows the sun to warm the ocean, itself a bad absorbent of heat; and hence the mean temperature of the year, which regu-

absence of erratic boulders in certain hot countries, are due to erroneous observations: several statements there given, I have since found confirmed by various authors.

¹ Geographical Journal, 1830, pp. 65, 66.

² Richardson's Append. to Back's Exped., and Humboldt's Fragm. Asiat., tom. ii. p. 386.

lates the zone of perpetually congealed under-soil, is low. It is evident that a rank vegetation, which does not so much require heat as it does protection from intense cold, would approach much nearer to this zone of perpetual congelation under the equable climate of the southern hemisphere, than under the extreme climate of the northern continents.

The case of the sailor's body perfectly preserved in the icy soil of the South Shetland Islands (lat. 62° to 63° S.), in a rather lower latitude than that (lat. 64° N.) under which Pallas found the frozen rhinoceros in Siberia, is very interesting. Although it is a fallacy, as I have endeavoured to show in a former chapter, to suppose that the larger quadrupeds require a luxuriant vegetation for their support, nevertheless it is important to find in the South Shetland Islands, a frozen under-soil within 360 miles of the forest-clad islands near Cape Horn, where, as far as the *bulk* of vegetation is concerned, any number of great quadrupeds might be supported. The perfect preservation of the carcasses of the Siberian elephants and rhinoceroses is certainly one of the most wonderful facts in geology; but independently of the imagined difficulty of supplying them with food from the adjoining countries, the whole case is not, I think, so perplexing as it has generally been considered. The plains of Siberia, like those of the Pampas, appear to have been formed under the sea, into which rivers brought down the bodies of many animals; of the greater number of these, only the skeletons have been preserved, but of others the perfect carcass. Now it is known, that in the shallow sea on the arctic coast of America the bottom freezes,¹ and does not thaw in spring so soon as the surface of the land; moreover, at greater depths, where the bottom of the sea does not freeze, the mud a few feet beneath the top layer might remain even in summer below 32° , as is the case on the land with the soil at the depth of a few feet. At still greater depths, the temperature of the mud and water would probably not be low enough to preserve the flesh; and hence, carcasses drifted beyond the shallow parts near an arctic coast, would have only their skeletons preserved: now in the extreme northern parts of Siberia bones are infinitely numerous, so that even islets are said to be

¹ Messrs. Dease and Simpson, in *Geograph. Journ.*, vol. viii. pp. 218 and 220.

almost composed of them;¹ and those islets lie no less than ten degrees of latitude north of the place where Pallas found the frozen rhinoceros. On the other hand, a carcass washed by a flood into a shallow part of the Arctic Sea, would be preserved for an indefinite period, if it were soon afterwards covered with mud, sufficiently thick to prevent the heat of the summer-water penetrating to it; and if, when the sea-bottom was upraised into land, the covering was sufficiently thick to prevent the heat of the summer air and sun thawing and corrupting it.

Recapitulation.—I will recapitulate the principal facts with regard to the climate, ice-action, and organic productions of the southern hemisphere, transposing the places in imagination to Europe, with which we are so much better acquainted. Then, near Lisbon, the commonest sea-shells, namely, three species of *Oliva*, a *Voluta* and *Terebra*, would have a tropical character. In the southern provinces of France, magnificent forests, intertwined by arborescent grasses and with the trees loaded with parasitical plants, would hide the face of the land. The puma and the jaguar would haunt the Pyrenees. In the latitude of Mont Blanc, but on an island as far westward as central North America, tree-ferns and parasitical Orchideæ would thrive amidst the thick woods. Even as far north as central Denmark, humming-birds would be seen fluttering about delicate flowers, and parrots feeding amidst the evergreen woods; and in the sea there, we should have a *Voluta*, and all the shells of large size and vigorous growth. Nevertheless, on some islands only 360 miles northward of our new Cape Horn in Denmark, a carcass buried in the soil (or if washed into a shallow sea, and covered up with mud) would be preserved perpetually frozen. If some bold navigator attempted to penetrate northward of these islands, he would run a thousand dangers amidst gigantic icebergs, on some of which he would see great blocks of rock borne far away from their original site. Another island of large size in the latitude of southern Scotland, but twice as far to the west, would be "almost wholly covered with everlasting snow," and would have each bay terminated by ice-cliffs, whence great masses would be yearly detached: this island would boast only of a little moss, grass, and burnet, and a tit-

¹ Cuvier (*Ossemens Fossiles*, tom. i. p. 151), from Billing's Voyage.

lark would be its only land inhabitant. From our new Cape Horn in Denmark, a chain of mountains, scarcely half the height of the Alps, would run in a straight line due southward; and on its western flank every deep creek of the sea, or fiord, would end in "bold and astonishing glaciers." These lonely channels would frequently reverberate with the falls of ice, and so often would great waves rush along their coasts; numerous icebergs, some as tall as cathedrals, and occasionally loaded with "no inconsiderable blocks of rock," would be stranded on the outlying islets; at intervals violent earthquakes would shoot prodigious masses of ice into the waters below. Lastly, some Missionaries attempting to penetrate a long arm of the sea, would behold the not lofty surrounding mountains, sending down their many grand icy streams to the sea-coast, and their progress in the boats would be checked by the innumerable floating icebergs, some small and some great; and this would have occurred on our twenty-second of June, and where the Lake of Geneva is now spread out! ¹

CHAPTER XII

CENTRAL CHILE

Valparaiso—Excursion to the foot of the Andes—Structure of the Land—Ascend the Bell of Quillota—Shattered masses of Greenstone—Immense Valleys—Mines—State of Miners—Santiago—Hot-baths of Cauquenes—Gold-mines—Grinding-mills—Perforated Stones—Habits of the Puma—El Turco and Tapacolo—Humming-birds.

July 23rd.—The *Beagle* anchored late at night in the bay of Valparaiso, the chief seaport of Chile. When morning came, everything appeared delightful. After Tierra del Fuego, the climate felt quite delicious—the atmosphere so dry, and the heavens so clear and blue with the sun

¹ In the former edition and Appendix, I have given some facts on the transportal of erratic boulders and icebergs in the Antarctic Ocean. This subject has lately been treated excellently by Mr. Hayes, in the *Boston Journal* (vol. iv. p. 426). The author does not appear aware of a case published by me (*Geographical Journal*, vol. ix. p. 528), of a gigantic boulder embedded in an iceberg in the Antarctic Ocean, almost certainly one hundred miles distant from any land, and perhaps much more distant. In the Appendix I have discussed at length, the probability (at that time hardly thought of) of icebergs, when stranded, grooving and polishing rocks, like glaciers. This is now a very commonly received opinion; and I cannot still avoid the suspicion that it is applicable even to such cases as that of the Jura. Dr. Richardson has assured me, that the icebergs off North America push before them pebbles and sand, and leave the submarine rocky flats quite bare: it is hardly possible to doubt that such ledges must be polished and scored in the direction of the set of the prevailing currents. Since writing that Appendix, I have seen in *North Wales* (*London Phil. Mag.*, vol. xxi. p. 280) the adjoining action of glaciers and of floating icebergs.

shining brightly, that all nature seemed sparkling with life. The view from the anchorage is very pretty. The town is built at the very foot of a range of hills, about 1600 feet high, and rather steep. From its position, it consists of one long, straggling street, which runs parallel to the beach, and wherever a ravine comes down, the houses are piled up on each side of it. The rounded hills, being only partially protected by a very scanty vegetation, are worn into numberless little gullies, which expose a singularly bright red soil. From this cause, and from the low whitewashed houses with tile roofs, the view reminded me of St. Cruz in Teneriffe. In a north-easterly direction there are some fine glimpses of the Andes: but these mountains appear much grander when viewed from the neighbouring hills; the great distance at which they are situated, can then more readily be perceived. The volcano of Aconcagua is particularly magnificent. This huge and irregularly conical mass has an elevation greater than that of Chimborazo; for, from measurements made by the officers in the *Beagle*, its height is no less than 23,000 feet. The Cordillera, however, viewed from this point, owe the greater part of their beauty to the atmosphere through which they are seen. When the sun was setting in the Pacific, it was admirable to watch how clearly their rugged outlines could be distinguished, yet how varied and how delicate were the shades of their colour.

I had the good fortune to find living here Mr. Richard Corfield, an old schoolfellow and friend, to whose hospitality and kindness I was greatly indebted, in having afforded me a most pleasant residence during the *Beagle's* stay in Chile. The immediate neighbourhood of Valparaiso is not very productive to the naturalist. During the long summer the wind blows steadily from the southward, and a little off shore, so that rain never falls; during the three winter months, however, it is sufficiently abundant. The vegetation in consequence is very scanty: except in some deep valleys, there are no trees, and only a little grass and a few low bushes are scattered over the less steep parts of the hills. When we reflect, that at the distance of 350 miles to the south, this side of the Andes is completely hidden by one impenetrable forest, the contrast is very remarkable. I took several long walks while collecting objects of natural history. The country is pleasant for exercise. There are many very beautiful flowers;