ART. VII.—1. *Narrative of the Surveying Voyages of H.M.S. Adventure and Beagle between the Years* 1826 *and* 1836, *describing their Examination of the Southern Shores of South America, and the Beagle's Circumnavigation of the Globe.* By Captain Philip Parker King, R.N., F.R.S., and Captain Robert Fitz-Roy, R.N. 2 vols. 8vo. With a separate Appendix. London. 1839.

2. *Journal of Researches into the Geology and Natural History of the various Countries visited by H.M.S. Beagle, under the command of Captain Fitz-Roy, R.N., from* 1832 *to* 1836. By Charles Darwin, Esq., M.A., F.R.S., Secretary to the Geological Society. 1 vol. 8vo. London. 1839.

SELF-IMMOLATION is a term which we have more than once heard applied to the course pursued by those officers of the British navy who have given themselves up to nautical surveying and discovery. If it is meant to convey the idea that they thereby take a line which, under existing circumstances, leads them from the more substantial rewards of their noble profession, there is far too much of truth in the expression; but if it be intended as an insinuation that such men are not employing themselves in the very best course of even mere professional training, we strenuously deny its applicability. If the perfect discipline and health of the crews, and their entire reliance on him who commands them;—if the constant habit of manœuvring the ship in all weathers and in all situations;—if a watchful preparation against surprise, whether from the elements or the wild races of men to whose shores she comes like some being of another world;—if a steadiness of purpose and unconquerable spirit under circumstances however adverse;—if these be principles and qualities to ensure victory in war, we know not where the country can look for them with more certainty than among this devoted class of seamen. Of the vast, the immeasurable value of the services which able officers thus employed are in the mean time rendering to science, to commerce, to their country, and to the whole civilised world, we need say nothing—nothing we could say would be too much.

In 1825 the Lords of the Admiralty directed two ships to be prepared for a survey of the southern coasts of South America, and early in 1826 they were ready to carry the orders of the Board into execution. Captain King, the senior officer (already highly distinguished for his Australian survey*), was on board the Adventure, a roomy ship of 330 tons. She was without

* See his interesting 'Narrative,' 8vo. 2 vols. London, 1827.

guns,

guns, excepting one for signals—was lightly, though strongly rigged, and very substantially built. Captain Pringle Stokes commanded the Beagle, a tight little vessel of 235 tons, carrying six guns. The expedition sailed from Plymouth on the 22nd of May, and after calling at Madeira, Teneriffe, St. Jago, and Rio de Janeiro, the ships dropped their anchors in Maldonado, on the north side of the river Plata, on the 13th of October. Each vessel was employed on that side between Cape St. Mary and Monte Video till the 12th of November, and on the 19th they quitted the river Plata. According to Captain King's instructions, *the survey* was to commence at Cape San Antonio, the southern limit of the entrance of the Plata, but he decided upon beginning with the southern coasts of Patagonia and Tierra del Fuego, including the straits of Magalhaens, or Magellan, as it is popularly written and called.

'In the first place, they presented a field of great interest and novelty; and secondly, the climate of the higher southern latitudes being so severe and tempestuous, it appeared important to encounter its rigours while the ships were in good condition—while the crews were healthy—and while the charms of a new and difficult enterprise had full force.'—*King*, vol. i. p. 1.

Accordingly, on the 28th the ships anchored at Port Santa Elena, and Captains King and Stokes, having landed to select a place for their observations, found the spot which the Spanish astronomers of Malaspina's voyage in 1798 had used for their observatory the most convenient for their purpose.

But before going into the general results, we find it necessary to state some of the changes which occurred among the officers under Captain King's command. In September, 1826, Lieutenant Hawes of the Beagle was invalided, and succeeded by Lieutenant Sholl, who died in 1828, and in February, 1827, Mr. Ainsworth was unfortunately drowned. He had crossed the strait with the gig and cutter to survey Port Antonio, and Captain King says,—

'In the evening the cutter returned; but, alas! with the melancholy information of the loss of Mr. Ainsworth and two seamen, drowned by the upsetting of the gig. One of the latter was my excellent coxswain, John Corkhill. The remainder of the gig's crew were only rescued from drowning by the strenuous exertions of those in the cutter.

'This disaster was much felt by every one. Ainsworth was a deserving officer, and highly esteemed. Corkhill was captain of the forecastle, and had served in the polar voyages under Sir Edward Parry. On the Sunday following, the colours were hoisted half-mast high, and the funeral service was read after morning prayers; for although to recover the bodies was impossible, their watery grave was before our eyes, and the performance of this last sad duty was a melancholy satisfaction.

" Ours are the tears, though few, sincerely shed,
When ocean shrouds and sepulchres our dead." '—vol. i. p. 63.

In June, 1827, Lieutenant Cooke of the Adventure invalided, and was succeeded by Mr. Wickham; in the same month, Mr. Graves, now the commander of the Beacon surveying-vessel in the Mediterranean, was promoted to the rank of lieutenant, a rank which, we regret to write, that officer, whose life has been one series of active service, still holds. In 1828, the distressing death of Captain Stokes occurred, and the Beagle was temporarily commanded by Lieut. Skyring. In December of that year, the commander-in-chief of the station, Sir Robert Otway, superseded the arrangements of Captain King, and appointed a commander, lieutenant, master, and surgeon to the Beagle. Captain King still retained his rank as senior officer, and had Mr. Graves for his lieutenant and assistant-surveyor. Captain Fitz-Roy took the command of the Beagle, with Skyring as his assistant-surveyor.

After four years of unremitting labour and hardship, the Adventure and Beagle sailed together from Rio de Janeiro on the 6th of August, 1830, and anchored in Plymouth Sound on the 14th of October. Both vessels were soon afterwards paid off.

The second expedition, under the command of Captain Fitz-Roy, during which the Beagle circumnavigated the globe, commenced in 1831; and the following incidents appear to have been intimately connected with its origin and plan. In February, 1830, the Beagle being then moored in Townshend harbour, on the south-west coast of Tierra del Fuego, a whale-boat belonging to the ship was stolen during a dark night, from a cove near Cape Desolation. Mr. Murray, the master, and his party, consisting of six men, being thus deprived of the means of returning to the Beagle, formed a canoe, or rather basket—for it was no better—with the branches of trees, and part of their coarsest tent. In this frail bark, favoured by the only fine day that had occurred for three weeks, three men, by his direction, made their way back to the Beagle, the *basket* having been twenty-four hours on its voyage. Assistance was immediately given to the master and the other men; but a search for the boat proved unsuccessful, although much of the *gear* was found; and the women and children of the Fuegian families, from whom it was recovered, were detained as hostages: the men, excepting one, escaped, or were absent, probably in the missing boat. At the end of February, the Beagle anchored in Christmas Sound; but, before this, all the prisoners had escaped, except three little girls, two of whom were restored to their own tribe, near Whale-boat Sound; the other remained on board, by the style and title of Miss Fuegia Basket. From the first canoe seen in Christmas Sound one man was

was taken as a hostage for the recovery of *the boat*, and as an interpreter and guide. 'He came to us,' says Captain Fitz-Roy, 'with little reluctance, and appeared unconcerned:' they called him Boat Memory. A few days afterwards, traces of the boat were found at some wigwams on an island in Christmas Sound, and from the families inhabiting those wigwams the Captain took another young man. No useful information, however, respecting the lost boat was gained from them, and the Beagle was obliged to leave that coast without recovering it. Afterwards, when in Nassau Bay, Fitz-Roy's captives stated that the natives of that part of the coast were their enemies, and that they spoke a different language. This intelligence made him anxious to persuade one of this eastern tribe to come on board, and stay in his ship; but he had then no hopes of doing so, and gave up the idea. Some time afterwards, however, when away in his boat exploring the Beagle Channel, he accidentally met three canoes, and prevailed on their occupants to put one of the party, a stout boy, into his boat, and in return he gave them beads, *buttons*, and other trifles. Fitz-Roy states that he does not know whether they intended that the boy should remain with his party permanently; but they seemed contented with their singular bargain, and paddled back towards the cove.

When Captain Fitz-Roy was about to depart from the Fuegian coast, he decided upon keeping these four natives on board, as they appeared quite cheerful and contented: he thought, too, that many good effects might be the consequence of their living a short time in England. They enjoyed excellent health; understood why they were taken; and looked forward with pleasure to seeing our country, and returning again to their own. We find these people on board the Beagle, at sea, on the 12th September, 1830, rejoicing in the following romantic nomenclature:—York Minster (so called from a cliffy promontory), whose years were estimated at twenty-six; Boat Memory, twenty; Jemmy—we beg his pardon—*James* Button, fourteen; and Miss Basket, nine years old.

Captain Fitz-Roy, in a letter to Captain King, dated as above, states the facts of which we have here given a summary; observes that he had maintained the Fuegians entirely at his own expense; that he held himself responsible for their comfort whilst away from their own country, and for their safe return; and requests that King, as the senior officer of the expedition, would consider of the possibility of some public advantage being derived from this circumstance, and of the propriety of offering them, with that view, to his Majesty's government. The letter concludes thus:—

'Should

'Should not his Majesty's government direct otherwise, I shall procure for these people a suitable education, and, after two or three years, shall send or take them back to their country, with as large a stock as I can collect of those articles most useful to them, and most likely to improve the condition of their countrymen, who are now scarcely superior to the brute creation.'—vol. ii. p. 6.

This letter Captain King forwarded to the Admiralty as soon as he arrived in England, and the answer stated that the Lords Commissioners would not interfere with Captain Fitz-Roy's personal superintendence of his four Fuegians, but would afford him any facilities for maintaining them while here, and would give them a passage home again. Anxious to protect the poor Indians from those diseases which have so often proved fatal to the aborigines of distant lands when brought to Europe, Captain Fitz-Roy obtained an order for their admission into the Naval Hospital at Plymouth; and there the good-hearted captain left them, with a diminished anxiety, in order to attend to his duties connected with the survey: but he had hardly reached London when the information came that poor Boat Memory had fallen a sacrifice to the dreadful disease that hurried the amiable Lee Boo to an untimely grave—a disease which, though in a great measure deprived of its terrors by Jenner, is far from being entirely disarmed. Boat Memory had been vaccinated four different times; but the three first operations had failed, and the last had just taken effect, when the fatal small-pox showed itself.

'This poor fellow,' says Captain Fitz-Roy, 'was a very great favourite with all who knew him, as well as with myself. He had a good disposition, very good abilities, and, though born a savage, had a pleasing, intelligent appearance. He was quite an exception to the general character of the Fuegians, having good features and a well-proportioned frame. It may readily be supposed that this was a severe blow to me, for I was deeply sensible of the responsibility which had been incurred; and, however unintentionally, could not but feel how much I was implicated in shortening his existence. Neither of the others were attacked, the last vaccination having taken full effect; but they were allowed to remain in the hospital for some time longer, until I could make satisfactory arrangements for them. While they were under Dr. Dickson's care, in the hospital, his own children had the measles; and thinking that it would be a good opportunity to carry the little Fuegian girl through that illness, he prepared her for it, and then took her into his house, among his own children, where she had a very favourable attack, and recovered thoroughly.'—vol. ii. p. 10.

Their education and maintenance were the next cares, and they were brought in a stage-coach to London, with none of the lions of which did they appear to be more struck than with that upon Northumberland House, which one of the party 'certainly thought

thought alive and walking there.' Captain Fitz-Roy took them to Walthamstow, where, through the kind intervention of the Rev. W. Wilson, they were received as inmates in the house of the master of the Infant School: there they remained till October, 1831; and they appear to have met with every kindness from that clergyman, the Rev. Joseph Wigram, and many others in the neighbourhood.

'The attention of their instructor was directed to teaching them English, and the plainer truths of Christianity, as the first object; and the use of common tools, a slight acquaintance with husbandry, gardening, and mechanism, as the second. Considerable progress was made by the boy and girl; but the man was hard to teach, except mechanically. He took interest in smith's or carpenter's work, and paid attention to what he saw and heard about animals; but he reluctantly assisted in garden work, and had a great dislike to learning to read. By degrees, a good many words of their own languages were collected (the boy's differed from that of the man and the girl), and some interesting information was acquired respecting their own native habits and ideas. They gave no particular trouble; were very healthy; and the two younger ones became great favourites wherever they were known. Sometimes I took them with me to see a friend or relation of my own, who was anxious to question them, and contribute something to the increasing stock of serviceable articles which I was collecting for their use, when they should return to Tierra del Fuego. My sister was a frequent benefactress; and they often talked, both then and afterwards, of going to see "Cappen Sisser." '—vol. ii. p. 12.

In the summer of 1831 King William expressed a wish to see them, and they were taken to St. James's, where his majesty asked many sensible and pertinent questions respecting them, their country, and the survey. Queen Adelaide, who was present, with the kindness that marks her character, left the room in which they were for a minute, and returned with one of her own bonnets, which she placed upon Miss Basket's head, at the same time putting one of her rings on the wild girl's finger—not forgetting to furnish her with a sum of money for an outfit of clothes when she should leave England.

Captain Fitz-Roy, who had reason to expect that the survey would be continued, was greatly disappointed at finding that there was no such intention; but he did not lose sight of his Fuegians, and, with the honourable spirit of an English gentleman, made an agreement with the owner of a small vessel, the John of London, to carry himself and four other persons to such places in South America as he wished to visit, and eventually to land him at Valparaiso. His arrangements were all made, and James Bennett, who had all along attended on the Fuegians, and was to accompany him, had already purchased a number of goats, with

with which the Captain intended to stock the islands of Tierra del Fuego—when 'a kind uncle,' to whom he had mentioned his plan, went to the Admiralty.

We are very glad that this same kind uncle *did* go to the Admiralty; for the result was a continuance of the survey, the appointment of Captain Fitz-Roy to the well-tried little Beagle, and an expedition which has made large additions to our scientific knowledge.

Besides the completion of the surveys, for the continuation of which Captain Beaufort, who so ably fills the office of Hydrographer, expressed his anxiety, there were other objects to be followed out. A considerable difference still existed between the longitude of Rio de Janeiro, as determined by Captains King, Beechey, and Foster, on the one hand, and Captain W. F. Owen, Baron Roussin, and the Portuguese astronomers on the other. As all our meridian distances in South America are measured from thence, it became of importance to decide between those authorities, or, at least, to reduce the difference within very narrow limits. Captain Beaufort's excellent 'Memorandum' enters at large upon the best method of coming to that decision, recommending in particular that the Beagle's voyage should be made in short stages, in order to detect the changes which take place in all chronometers during a continuous increase of temperature. Captain Fitz-Roy was naturally desirous of adding as much as possible to the completion of the survey, and embarked with a set of the best chronometers, both public and private, resolving to spare no expense, and entertaining the hope that a chain of meridian distances might be carried round the world, if the return to England were made across the Pacific and by the Cape of Good Hope.

'Anxious,' says Captain Fitz-Roy, 'that no opportunity of collecting useful information during the voyage should be lost, I proposed to the hydrographer that some well-educated and scientific person should be sought for who would willingly share such accommodations as I had to offer, in order to profit by the opportunity of visiting distant countries yet little known. Captain Beaufort approved of the suggestion, and wrote to Professor Peacock, of Cambridge, who consulted with a friend, Professor Henslow, and he named Mr. Charles Darwin, grandson of the poet, as a young man of promising ability, extremely fond of geology, and indeed all branches of natural history. In consequence an offer was made to Mr. Darwin to be my guest on board, which he accepted conditionally; permission was obtained for his embarkation, and an order given by the Admiralty that he should be borne on the ship's books for provisions. The conditions asked by Mr. Darwin were, that he should be at liberty to leave the Beagle and retire from the expedition when he thought proper, and that he should pay a fair share of the expenses of my table.'—vol. ii. pp. 18, 19.

Mr.

Mr. Darwin availed himself of this permission, and he speaks in the most grateful terms of the treatment which he received throughout from Captain Fitz-Roy, who may well be satisfied with the results of his praiseworthy suggestion.

On the 27th of November, 1831, the well-manned, well-appointed, and well-provided Beagle sailed from Barn Pool, and having circumnavigated the globe and accomplished all the objects which the expedition had in view, as far as was practicable, she anchored at Falmouth on the 2nd of October, 1836, after an absence of four years and nine months. In this long voyage there was no fatal disease, with the exception of the case of the purser, who died of an internal complaint having no relation whatever to the service in which he had been employed, nor was there any serious illness.

'This freedom from illness,' observes Captain Fitz-Roy, 'must be attributed, under Providence, to active employment, good clothing, and wholesome food, in healthy, though sometimes disagreeable climates; and our immunity from accident during exposure to a variety of risks, especially in boats, I attribute, referring to visible causes, to the care, attention, and vigilance of the excellent officers, whose able assistance was not valued by me more than their sincere friendship.'—vol. ii. p. 639.

It is impossible not to notice the modesty with which this fine officer passes his own devoted care and watchfulness. He has spent *nine* of the best years of his life in this survey—but in every respect they seem indeed to have been most nobly spent.

None of the longitudes given in Captain Fitz-Roy's tables depend upon absolute or independent astronomical observations; and the principal results of the Beagle's chronometrical measurements between 1831 and 1836 form a connected chain of meridian distances round the globe—'the first,' says Captain Fitz-Roy, 'that has ever been completed or even attempted by chronometers alone.' The sum, however, of all the parts which form the chain amounts, he tells us, to more than twenty-four hours, the whole exceeding that time by about thirty-three seconds of time; and, therefore, as he remarks, error must exist somewhere. The cause of that error, or where it may exist, he is unable to determine; but he says,—

'The only idea I can dwell on, with respect to the cause of this error of thirty-three seconds, is, that chronometers may be affected by magnetic action in consequence of a ship's head being for a considerable time towards the east or west: yet this is but a conjecture. In the measures between Bahia and Rio de Janeiro, and in those between Rio de Janeiro and Cape Horn, there is no evidence of any permanent cause of error; but the greater part of those measurements were made with the ship's head usually near the meridian.

'Were

'Were I to select three measurements which I thought less trustworthy than others, I should decide on that from the Galapagos to Otaheite, from Otaheite to New Zealand, and from Hobart Town to King George Sound; but I do not think that either one of these can be five seconds of time in error, according to regular computation, without supposing some unknown cause of error to exist. If each of the three were five seconds wrong, and each error lay in the same direction, still there would only be fifteen seconds out of thirty-two accounted for. Such a supposition as this, however, that each of these three measurements is five seconds, or thereabouts, in error (referring only to error caused by known means) appears to be extremely improbable, I would almost say impossible.

'It will naturally occur to the reader, that as error, undetected as to locality, exists, arbitrary correction must be made in order to reduce 24h. 0m. 33s. to 24h.'—*Appendix*, pp. 345, 346.

Otaheite having been selected as a point at which such a correction might be made with the least degree of inconvenience, to that place the longitudes in the Beagle's tables are given as measured westward by Cape Horn, and eastward from Greenwich by the Cape of Good Hope; and there, as the two portions of the chain overlap, a mean has been taken between the resulting longitudes. Though this error is to be lamented, it cannot be a very serious one; and a perusal of the principal measurements, collated with other determinations, will show that much weight is to be attached to the greatest part of the results obtained by the officers of the Beagle.

We must now, however, turn back to Captain King's voyage, which abounds with interesting information in every branch of natural history. The publication of this part of the work was intrusted to Captain Fitz-Roy; and though he says that, being hurried and unwell, he could not do it justice, we think he has fulfilled the trust reposed in him in a most admirable manner. We know how he devoted himself to *this* portion of the publication, at the expense of no small delay in the appearance of his own. We know, too, how liberally he has furnished everything that he thought would add to the value of *this* volume, particularly in the way of illustration.

The Patagonians stand out as the principal objects in any narrative of a voyage to the Straits of Magellan, and few things are more striking than the discrepancy between the accounts of former voyagers and those of later periods. According to Captain King, of fifty Patagonian men, not one of whom looked more than fifty-five years of age, one man only exceeded six feet, while the generality were between five feet ten and six feet in height. Now the account given of those seen by Magalhaens and his people at Port San Julian is very circumstantial, and the general height

is

is stated at about seven feet (French): but one was 'so tall,' says the narrative, 'that our heads scarcely came up to his waist, and his voice was like that of a bull!' This giant had approached them singing with a depth of intonation that would have done honour to Polypheme himself, and only to be imagined by those who have heard Lablache throw out the full volume of his *organ*. They had with them beasts of burthen on which they placed their wives—guanacoes, probably, from the description. Herrera notices the least of the Patagonians as being larger and taller than the stoutest man of Castile; and Transylvanus gives their height as being ten palms or spans—about seven feet six inches. Loyasa, in 1525, speaks only generally, as having seen savages of great stature in the Straits; but it is probable that these were the smaller race of Fuegians, and this seems to have been the case when the same Straits were passed in 1535 by Alcazova, and attempted in 1540 by Alphonso de Camargo, neither of whom appears to have been visited by Patagonians. It is not clear that Drake saw any of these last very closely, though his fleet put into Port San Julian, where they found natives of large stature. The author of 'The World Encompassed,' in which work Drake's voyage is detailed, speaking of the size and height of these people, supposes the name given to them to have been *Pentagones*, to denote a stature of five cubits, or seven feet and a half.* The Indians whom Drake met within the strait are spoken of as small in stature: these seem to have been Fuegians. Sarmiento, who had an encounter with them, in which he and others were wounded, calls them 'Gente grande,' and 'Los Gigantes;' and he describes the proportions of one whom he made prisoner by the words 'Es crecido de miembros.' He formed an establishment named 'Jesus,' in the spot where giants had been seen; but in the account of that colony no mention is made of people of large stature, though Tomé Hernandez states that the Indians of the plains, who are giants, communicate with the Indians of Tierra del Fuego, who are like them. In Sir Thomas Cavendish's first voyage (1586) it is stated that one of the Patagonian footsteps was measured, and gave a length of eighteen inches. Knyvet, in his account of Sir Thomas's second voyage (1591), describes the Patagonians as fifteen or sixteen spans in height! and adds that, of those 'cannibals,' above a thousand came to them at one time. In 1599, Sebald de Veert states that he was attacked in the strait by savages of reddish colour, and with long hair, whom he thought to be ten or eleven

* This name of Patagons appears to have been first given to the race by Magalhaens, because they wore a sort of slipper or boot made of the skins of animals.

feet

feet high. The wretched natives murdered by the Dutch Admiral, Oliver van Noort, on the island of Santa Marta, near Elizabeth Island—for though Pennant calls it a rencontre, a most inhuman murder it was—are described as being of nearly the same stature as the common people in Holland, but broad and high-chested. Among some captives taken on board, however, was a boy, and he informed the crew that there was a tribe living farther inland, whose names were *Tiremenen*, and their territory *Coin ;* that they were 'great people like giants, being from ten to twelve feet high, and that they came to make war against the other tribes, whom they reproached for being eaters of ostriches!' Spilbergen, another Dutchman, saw, in his passage through the strait, a man of gigantic stature on the hills, as if for the purpose of observing the ships; and on an island near the entrance of the Strait were found the dead bodies of two natives, wrapped in penguin-skins and lightly covered with earth—one being of the usual stature, but the other two feet and a half longer. The accounts given by Le Maire and Schouten of the graves of the Patagonians agree precisely with what Captain King noticed at Sea-Bear bay, the body, in both cases, being laid on the ground and covered with a heap of stones; but Le Maire and Schouten describe the skeletons as measuring ten or eleven feet in length, 'the skulls of which,' it is added, 'we could put on our heads in the manner of helmets.' The Nodales do not appear to have met any natives on the northern side of the strait; and they pass over those with whom they did communicate (Fuegians), without particular notice as to their stature. The Dutch Admiral, Henry Brewer, observed human footsteps which measured eighteen inches, in the strait Le Maire. Sir John Narborough (1670) did not, apparently, fall in with any of the true Patagonian race: he saw well-shaped, athletic Indians at Port San Julian, but he says that a Mr. Wood was taller than any of them. The nineteen natives that Sir John saw on Elizabeth Island must have been Fuegians. Neither Bartholomew Sharp (1680), De Gennes (1696), nor Beauchesne Gouin (1699), appear to have seen any of the tall race; but Bulkley and his companions saw them in 1741, mounted on horses or mules, and this seems to be the first notice of their possession of these animals. In 1766, Duclos de Guyot had an interview with seven Patagonians, mounted on horses with saddles, bridles, and stirrups. The shortest of the men measured five feet eleven inches and a quarter (English); the others were considerably taller: they called their chief, or leader, 'Capitan.' We now come to the evidence of Byron:—

'One of them,' says the Commodore, 'who afterwards appeared to be chief,

chief, came towards me; he was of gigantic stature, and seemed to realize the tales of monsters in a human shape: he had the skin of some wild beast thrown over his shoulders, as a Scotch Highlander wears his plaid, and was painted so as to make the most hideous appearance I ever beheld: round one eye was a large circle of white, a circle of black surrounded the other, and the rest of his body was streaked with paint of different colours. *I did not measure him*, but if I may judge of his height by the proportion of his stature to my own, it could not be less than seven feet. When this frightful Colossus came up, we muttered somewhat to each other as a salutation.'

The Commodore also notices one of the women as being of most enormous size, and graphically describes the effect produced by this company of giants on his Lieutenant, who arrived during the performance of a song:—

'Mr. Cumming came up with the tobacco, and I could not but smile at the astonishment which I saw expressed in his countenance upon perceiving himself, though six feet two inches high, become at once a pigmy among giants, for these people may, indeed, more properly be called giants than tall men: of the few among us who are full six feet high, scarcely any are broad and muscular in proportion to their stature, but look rather like men of the common bulk grown up accidentally to an unusual height; and a man who should measure only six feet two inches, and equally exceed a stout well-set man of the common stature in breadth and muscle, would strike us rather as being of a gigantic race, than as an individual accidentally anomalous: our sensations, therefore, upon seeing five hundred people, the shortest of whom were at least four inches taller, and bulky in proportion, may be imagined.'

Now this account was published only seven years after the voyage; and the exaggeration, if any existed, might, as Captain King admits, have been exposed by many. 'There can be no doubt,' adds the Captain, 'that, among five hundred persons, several were of a large size; but that all of them were four inches taller than six feet must have been a mistake. The Commodore says that he caused them all to be seated, and in that position, from the length of their bodies, they would certainly appear to be of very large stature.'

But, to corroborate the evidence of the Commodore, we have that of Captain Charles Clerke, who was a midshipman in the 'Dolphin,' Byron's ship, and afterwards commanded the 'Discovery,' in Captain Cook's last voyage, on board of which last vessel he died, much respected, in August, 1779. His account, dated November, 1766, was read before the Royal Society, in April, 1767, immediately after Byron's return, and whilst the facts were fresh in the memories of all. These are his words:—

'We were with them near two hours, at noon-day, within a very few yards,

yards, though none had the honour of shaking hands but Mr. Byron and Mr. Cumming: however, we were near enough and long enough with them, to convince our senses so far as not to be cavilled out of the very existence of those senses at that time, which some of our countrymen and friends would absolutely attempt to do. They are of a copper colour, with long black hair, and some of them are certainly nine feet, if they do not exceed it. The Commodore, who is very near six foot, could but just reach the top of one of their heads, which he attempted on tip-toes; and there were several taller than him on whom the experiment was tried. They were prodigious stout, and as well and proportionally made as ever I saw people in my life..... The women, I think, bear much the same proportion to the men as our Europeans do: there was hardly a man there less than eight feet, most of them considerably more; the women, I believe, run from seven and a half to eight feet. Their horses were stout and bony, but not remarkably tall: they are, in my opinion, from fifteen to fifteen and a half hands. They had a great number of dogs, about the size of a middling pointer, with a fox nose. They continued upon the beach till we got under way, which was two hours after we got on board.'—*Phil. Trans.* vol. 57.

This is very circumstantial; but Bougainville, who landed among them about the same period, speaks very differently. 'They have,' says he, 'a fine shape: among those whom we saw, not one was below five feet ten inches and a quarter (English), nor above six feet two inches and a half in height. Their gigantic appearance arises from their prodigiously broad shoulders, the size of their heads, and the thickness of all their limbs. They are robust and well fed: their nerves are braced, and their muscles strong, and sufficiently hard.'

Captain King continues the chain of evidence from Byron, and thus comments on it:—

'Shortly afterwards, Wallis, in the neighbourhood of Cape Virgins, communicated with the same people, and as the story of the Patagonian giants had been spread abroad, and was very much discredited, he carried two measuring rods with him; and says in his narrative, "We went round and measured those that appeared to be the tallest. One was six feet seven inches high, several more were six feet five, and six feet six inches; but the stature of the greatest part of them was from five feet ten to six feet."

'In the voyage of the Santa Maria de la Cabeza, 1786, it is related that the height of one or two Patagonians, with whom the officers had an interview, was six feet eleven inches and a half (of Burgos), which is equal to six feet four inches and a half, English. This man wore a sword, on which was engraved "Por el Rey Carlos III.," and spoke a few words in Spanish, proofs of his having had communication with some of the Spanish settlements. It does not, however, appear from the account that there were many others, if any, of that height.

'Of all the above accounts, I think those by Bougainville and Wallis the

the most accurate. It is true that, of the number we saw, none measured more than six feet two inches; but it is possible that the preceding generation may have been a larger race of people, for none that we saw could have been alive at the time of Wallis's or Byron's voyage. The oldest certainly were the tallest; but, without discrediting the accounts of Byron, or any other of the modern voyagers, I think it probable that, by a different mode of life, or a mixture by marriage with the southern or Fuegian tribes, which we know has taken place, they have degenerated into a smaller race, and have lost all right to the title of giants: yet their bulky, muscular forms, and length of body, in some measure bear out the above accounts; for had the present generation proportionate limbs, they might, without any exaggeration, justify the account of Commodore Byron. The Jesuit missionary, Falkner, who, from an intercourse of forty years with the Indians of South America, must be considered as one of the best authorities, says, speaking of a Patagonian named Cangapol, "This chief, who was called by the Spaniards the Cacique Bravo, was tall and well proportioned: he must have been seven feet and some inches in height, because on tiptoe I could not reach the top of his head: I was very well acquainted with him, and went some journeys in his company: I do not recollect ever to have seen an Indian that was above an inch or two taller than Cangapol. His brother Sausimian was but about six feet high. The Patagonians or Puelches are a large-bodied people; but I never heard of that gigantic race which others have mentioned, though I have seen persons of all the different tribes of the Southern Indians."

'This is an account in 1746, only twenty years before that of Bougainville. Taking all the evidence together, it may be considered that the medium height of the males of these southern tribes is about five feet eleven inches. The women are not so tall, but are in proportion broader and stouter: they are generally plain-featured. The head is long, broad, and flat, and the forehead low, with the hair growing within an inch of the eyebrows, which are bare. The eyes are often placed obliquely, and have but little expression; the nose is generally rather flat, and turned up; but we noticed several with that feature straight, and sometimes aquiline: the mouth is wide, with prominent lips, and the chin is rather large; the jaws are broad, and give the face a square appearance; the neck is short and thick; the shoulders are broad; the chest is broad and very full; but the arm, particularly the fore-arm, is small, as are also the foot and leg; the body long, large, and fat, but not corpulent. Such was the appearance of those who came under my observation.'—vol. i. pp. 101—103.

That some of the earlier accounts may have been heightened by the optical delusion arising from the sight of some of these people on high ground, and in relief against the sky, and others again by a natural tendency to the marvellous, is very probable: but it is difficult to repudiate the strong general evidence of the great height and bulk of these Indians in former years; whilst it is not at all incompatible with general experience that the present

may

may be a diminished race. Many causes may have operated to produce this degeneracy. That the like may happen even in civilized countries we have the following proof:—It is shown in that valuable miscellany, 'The United Service Journal,' for September last, that a decrease of stature has become quite manifest in France—as compared with the state of things before the revolutionary miseries began. The investigations of M. Villermé prove that the stature of the conscripts has been sensibly diminishing during the last forty years. Before the revolution, the *minimum* height for admission as a grenadier was 5 feet 5 inches French, or 5 feet $10\frac{1}{2}$ inches English. During the republic it was reduced to 5 feet $9\frac{1}{2}$ inches; in the Imperial armies it was further diminished to 5 feet $8\frac{1}{2}$ inches; and during the Restoration it sank to 5 feet $7\frac{3}{4}$ inches. At the present day, every well-conducted man, whatever may be his height, is qualified for admission into the picked companies. Besides the direct effects of battles and the guillotine, various other causes, such as the exemption from service accorded to married men under certain circumstances, are supposed to have assisted in this diminution, the men marrying, at an early period of life, women in precarious health, or of advanced years, to escape the conscription, and thus producing a less robust race. M. Villermé relates, that a portion of our army being quartered in France in 1815, a contract was entered into with French manufacturers to supply them with caps, which were made in exact conformity with the instructions of the French war-department. When the caps were delivered, it was found that two-thirds were useless; and that the largest fitted none but the smallest English heads.

Here is a specimen of Captain King's amusing account of the appearance, habits, and manners of his still burly friends:—

'On a hill near us we observed three or four Patagonian Indians standing together, and their horses feeding close to them. A fire was soon kindled, to attract our notice, to which signal we replied by showing our colours; and had we not already communicated with these people, we should certainly have thought them giants, for they "loomed very large" as they stood on the summit of the hill. This optical deception must doubtless have been caused by mirage: the haze has always been observed to be very great during fine weather and a hot day, arising from rapid evaporation of the moisture so abundantly deposited on the surface of the ground in all parts of the Strait.

'As soon as the Patagonians found they were noticed, they mounted and rode along the shore abreast of us, being joined by other parties, until the whole number could not have been less than forty. Several foals and dogs were with them. Having anchored in Gregory Bay, where I intended remaining for two days to communicate with them, I sent

sent up a rocket, burnt a blue-light, and despatched Lieutenant Cooke on shore to ask for a large supply of guanaco meat, for which we would pay in knives and beads. The boat returned on board immediately, bringing off four natives, three men and "Maria." This rather remarkable woman must have been, judging by her appearance, about forty years old: she is said to have been born at Assuncion, in Paraguay, but I think the place of her birth was nearer Buenos Ayres. She spoke broken but intelligible Spanish, and stated herself to be sister of Bysante, the cacique of a tribe near the Santa Cruz River, who is an important personage, on account of his size (which Maria described to be immense) and his riches. In speaking of him, she said he was *very* rich; he had many mantles, and also many hides ("*muy* rico, tiene muchas mantas y tambien muchos cueros"). One of Maria's companions, a brother of Bysante, was the tallest and largest man of this tribe; and though he only measured six feet in height, his body was large enough for a much taller man. He was in great affliction: his daughter had died only two days before our arrival; but, notwithstanding his sad story, which soon found him friends, it was not long before he became quite intoxicated, and began to sing and roar on the subject of his misfortunes, with a sound more like the bellowing of a bull than the voice of a human being. Upon applying to Maria, who was not quite so tipsy as her brother, to prevent him from making such hideous noises, she laughed and said, "Oh, never mind, he's drunk; poor fellow, his daughter is dead" (Es boracho, povrecito, murió su hija); and then, assuming a serious tone, she looked towards the sky, and muttered in her own language a sort of prayer or invocation to their chief demon, or ruling spirit, whom Pigafetta, the companion and historian of Magalhaens, called *Setebos*, which Admiral Burney supposes to have been the original of one of Shakspeare's names in The Tempest—

> 'His art is of such power,
> He would control my dam's god Setebos.'

'Maria's dress was similar to that of other females of the tribe; but she wore ear-rings, made of medals stamped with a figure of the Virgin Mary, which, with the brass pin that secured her mantle across her breast, were given to her by one Lewis, who had passed by in an American sealing-vessel, and who, we understood from her, had made them *Christians*.'—*King*, p. 88.

To what their *Christianity* amounts we may gather from one of the next pages.

'At Maria's return, her husband told her that I had been very inquisitive about a red baize bundle, which he told me contained "Cristo," upon which she said to me "Quiere mirar mi Cristo?" (do you wish to see my Christ?), and then, upon my nodding assent, called around her a number of the tribe, who obeyed her summons. A ceremony then took place. Maria, who, by the lead she took in the proceedings, appeared

to be high priestess as well as cacique, began by pulverising some whitish earth in the hollow of her hand, and then taking a mouthful of water, spat from time to time upon it, until she had formed a sort of pigment, which she distributed to the rest, reserving only sufficient to mark her face, eyelids, arms, and hair with the figure of the cross. Maria then took from the folds of the sacred wrapper an awl, and with it pierced either the arms or ears of all the party; each of whom presented in turn, pinched up between the finger and thumb, that portion of flesh which was to be perforated. The object evidently was to lose blood, and those from whom the blood flowed freely showed marks of satisfaction, while some whose wounds bled but little underwent the operation a second time.

'Maria then, with great solemnity and care, muttering to herself in Spanish (not two words of which could I catch, although I knelt down close to her), removed two or three wrappers, and exposed to our view a small figure, carved in wood, representing a dead person, stretched out. After exposing the image, to which all paid the greatest attention, and contemplating it for some moments in silence, Maria began to descant upon the virtues of her Christ, telling us it had a good heart ("buen corazon"), and that it was very fond of tobacco. "Mucho quiere mi Cristo tabaco, da me mas." (My Christ loves tobacco very much, give me some more.) Such an appeal, on such an occasion, I could not refuse; and after agreeing with her in praise of the figure, I said I would send on board for some.'—*King*, p. 92.

The Captain soon visited Maria's residence in the interior:—

'We found eight or ten huts arranged in a row; the sides and backs were covered with skins, but the fronts, which faced the east, were open; even these, however, were very much screened from wind by the ridge of hills eastward of the plain. Near them the ground was rather bare, but a little farther back there was a luxuriant growth of grass, affording rich and plentiful pasture for the horses, among which we observed several mares in foal, and colts feeding and frisking by the side of their dams: the scene was lively and pleasing, and, for the moment, reminded me of distant climes, and days gone by.

'The dwellings are all alike. In form they are rectangular, about ten or twelve feet long, ten deep, seven feet high in front, and six feet in the rear. The frame of the building is formed by poles stuck in the ground, having forked tops to hold cross pieces, on which are laid poles for rafters, to support the covering, which is made of skins of animals sewn together so as to be almost impervious to rain or wind. The posts and rafters, which are not easily procured, are carried from place to place in all their travelling excursions. Having reached their bivouac, and marked out a place with due regard to shelter from the wind, they dig holes with an iron bar or piece of pointed hard wood, to receive the posts; and all the frame and cover being ready, it takes but a short time to erect a dwelling. Their goods and furniture are placed on horseback under the charge of the females, who are mounted aloft upon them.

them. The men carry nothing but the lasso and bolas, to be ready for the capture of animals, or for defence.'—*Ibid.* p. 96.

Interesting as this volume is, we are unable to afford room for any more extracts; nor will the reader have cause to complain of this, for the scenes will rise before him with far greater force in the book itself. He will find traces of former voyages ingeniously brought to light, and even some remains—such, at least, they may fairly be concluded to be—of the hapless 'Wager,' together with masterly descriptions of the countries and the people visited, both savage and civilized; among which the chapter on the province and islands of Chiloe deserves particular notice. He will read of the natural productions, interwoven in the narrative in a pleasing and popular style, and more scientifically detailed in the Appendix—now following the Captain as he watches the frail humming-bird stoutly facing a snow-storm—or the rapid progression of the steamer-ducks, or race-horses, as Cook called them (*Micropteri brachypterus* and *Patachonicus*), as they rapidly propel themselves along rather than through the water with their small wings and their strong broad-webbed feet; and anon going along with him as he collects and describes his testaceous treasures, not forgetting the high relish of the excellent stew that the large mussels of those high latitudes make. Whilst upon culinary subjects, we would also call attention to the Beagle's game-book, containing a register of those animals which were used for the table—among the rest shags, as well as hawks and owls. We once heard a celebrated zoologist, who spent some time in the vast forests of South America, declare that 'everything except owl was eatable; hawk, to be sure, was not good, but owl was intolerable.' Even the bird of Minerva seems, however, to have passed muster with our gallant voyagers: 'young seal and young penguins were liked;' indeed old seals, otters, and foxes seem alone, or almost alone, to have found no favour. In common fairness, the name of the cook of the Beagle should have been blazoned—he must have been born with the genius of a *cordon bleu*.

The journal of Captain Stokes, whose tragical death in the very prime of his days is attributable to the anxiety arising from the severe hardship of the cruize, the dreadful weather he experienced, and the dangerous situations to which the party were so constantly exposed, operating upon an excitable mind, will be read with painful interest. It abounds with useful and curious information—as do those of Lieutenants Skyring and Graves, written while they were employed, in the Adelaide schooner, exploring and surveying the Magdalen and Barbara channels. The journals of Captain Fitz-Roy occupy, and most deservedly, a considerable portion of this volume; of which we must now

reluctantly take leave, with the observation that the Appendix, containing the tables of latitude and longitude, variation of the compass, tide, height of the mountains and land—the magnetic observations, discussed by Major Sabine with his wonted acuteness and accuracy—the zoology,* &c.—exhibits good work well digested. A comparison of the charts with those of Sir John Narborough and Cordova, which were perhaps the most correct plans of the Strait formerly extant, and with the additions made by Byron, Wallis, Carteret, Bougainville, Cook, and Weddell, will show the high value of this first expedition, as viewed with reference to the survey.

We now turn to Captain Fitz-Roy's own volume, which we have found even more entertaining and interesting than that which we have just laid down. Taken altogether, it leaves a most favourable impression of the writer's intellectual endowments, as well as of his moral qualities; nor can we, in fact, find anything that we are called upon to condemn, excepting certain '*Remarks on the Deluge.*' On this subject the gallant Captain has got quite beyond his depth—but we content ourselves with this protest, and a strong advice to read Sir John Herschel's *Discourse on the Study of Natural Philosophy*, before he ventures again in the same direction.

On the 15th of December, 1832, they first saw the land off Tierra del Fuego, near Cape San Sebastian, and next day closed the shore about Cape Sunday, ran along it past Cape Peñas, and anchored off Santa Inez. Their motions were attentively watched by a group of Indians off Cape Peñas, who were too far off for our voyagers to make out more than that they were very tall men, on foot, nearly naked, and accompanied by several large dogs.

'To those,' says Captain Fitz-Roy, 'who had never seen man in his savage state—one of the most painfully-interesting sights to his civilized brother—even this distant glimpse of the aborigines was deeply engaging; but York Minster and Jemmy Button asked me to fire at them, saying that they were "Oens-men—very bad men."'—vol. ii., p. 119.

Notwithstanding this sanguinary petition of the more accomplished Fuegians, they seemed to be much elated at the certainty of being so near their own wild home. The all-absorbing passion, which makes even the savage who has tasted of the luxuries of civilization look with longing to the land of his sires, however rugged—shone forth; and the boy was never weary of telling how excellent his was—how glad his friends would be to see him—and

* The zoological papers had been previously laid before the public in the *Zoological Journal* and in the *Proceedings of the Zoological Society* of London. The excellent *Sailing Directions* were published in 1832.

how

how well they would treat the Captain and his people for their kindness to him. An interview with some of the natives was now at hand.

'18th. Mr. Darwin, Mr. Hamond, and others, went with me; and deeply indeed was I interested by witnessing the effect caused in their minds by this first meeting with man in such a totally savage state. —I can never forget Mr. Hamond's earnest expression, "What a pity such fine fellows should be left in such a barbarous state!" It told me that a desire to benefit these ignorant, though by no means contemptible, human beings was a natural emotion, and not the effect of individual caprice or erroneous enthusiasm; and that his feelings were exactly in unison with those I had experienced on former occasions, which had led to my undertaking the heavy charge of those Fuegians whom I brought to England. Disagreeable, indeed painful, as is even the mental contemplation of a savage, and unwilling as we may be to consider ourselves even remotely descended from human beings in such a state, the reflection that Cæsar found the Britons painted and clothed in skins, like these Fuegians, cannot fail to augment an interest excited by their childish ignorance of matters familiar to civilized man, and by their healthy, independent state of existence.'—*Fitz-Roy*, vol. ii. p. 120.

It is but fair, however, to let Mr. Darwin describe the feelings whose effect so much interested his generous Captain:—

'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 anything 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 had 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

children had been sent away. These Fuegians are a very different race from the stunted miserable wretches farther to the westward. They are much superior in person, and 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, as often leaving their persons 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 parallel and above the first, so that even his eyelids were thus coloured. Some of the other men were ornamented by streaks of black powder, made of charcoal. The party altogether closely resembled the devils which come on the stage in such plays as 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 habits 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 recognised. 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 to 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

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 "cuchillo." 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.

'It was interesting to watch the conduct of these people towards Jemmy Button: they immediately perceived the difference between him and the rest, and held much conversation between themselves 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 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. 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 amongst 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 the first feeling on our part of grave astonishment was over, nothing could be more ludicrous or interesting than the odd mixture of surprise and imitation which these savages every moment exhibited.'—*Darwin*, vol. iii. pp. 227—230.

Captain Fitz-Roy's purpose was to deposit York Minster and little Basket among their own people near March Harbour, and return eastward through the Beagle Channel, landing Button also with his tribe, the Tekeenica. Part of Whale-boat Sound and the western arms of the Beagle Channel were to be surveyed; and by this scheme the Captain proposed to combine both objects. But the foul weather which they now experienced was, in one of its paroxysms, very near sending the Beagle and her gallant crew to add to the 'thousand fearful wrecks' with which the ocean-floor is strewed.

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

'At

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

'For a moment our position was critical; but, like a cask, she rolled back again, though with some feet of water over the whole deck. Had another sea then struck her, the little ship might have been numbered among the many of her class which have disappeared: but the crisis was past—she shook the sea off her through the ports, and was none the worse—excepting the loss of a lee-quarter boat, which, although carried three feet higher than in the former voyage (1826-1830), was dipped under water, and torn away.'—*Fitzroy*, vol. ii. p. 125.

This is written in the true spirit of a sailor who is

'All as one as a piece of his ship.'

The chapter on the Southern Aborigines of South America is very well done, combining considerable research with shrewd and original observation. The next, on the 'Horse Indians' of Patagonia, throws much light on their manners and superstitions. They believe in a transmigration of souls, for which we refer the curious reader to an extract from Viedma's diary, in the appendix.

'They all believe that the wizards or witches can injure whom they choose, even to deprivation of life, if they can possess themselves of some part of their intended victim's body, or that which has proceeded thence, such as hair, pieces of nails, &c.; and this superstition is the more curious from its exact accordance with that so prevalent in Polynesia.'—vol. ii. p. 163.

Their wizards and witches are, according to Falkner, held in high respect; but the distinction appears to have been somewhat dangerous, for, in cases of pestilence, they often become involuntary Ions, an order being issued to put them to death by way of propitiation. Thus, when the small-pox almost destroyed the Chechehet tribe, Cangapol, the chief, directed that all the wizards should be killed, that so the distemper might be stayed.

But the 'Horse Indians' may be looked upon as civilised human beings compared with the 'unaccommodated, poor, bare, forked animal'

animal' of a Fuegian or 'Canoe Indian.' He is 'the thing itself,' and here is his portrait admirably drawn. After considering it, well may we exclaim with poor Lear, 'Is man no more than this?'

'The most remarkable traits in the countenance of a Fuegian are his extremely small, low forehead, his prominent brow, small eyes (suffering from smoke), wide cheek-bones, wide and open nostrils, large mouth, and thick lips. Their eyes are small, sunken, black, and as restless as those of savages in general. Their eyelids are made red and watery by the wood smoke in their wigwams. The chin varies much: that of a Tekeenica is smaller and less prominent than that of an Alikhoolip, in whom it is large and rather projecting, but there is much variety. The nose is always narrow between the eyes, and, except in a few curious instances, is hollow, in profile outline, or almost flat. The mouth is coarsely formed (I speak of them in their savage state, and not of those who were in England, whose features were much improved by altered habits and by education): their teeth are very peculiar; no canine, or eye-teeth, project beyond the rest, or appear more pointed than those; the front teeth are solid, and often flat-topped like those of a horse eight years old, and enamelled only at the sides; the interior substance of each tooth is then seen as plainly, in proportion to its size, as in that of a horse. Their hair is black, coarse, and lank, excepting the few instances mentioned below. It grows by single hairs, not by piles, or by little bunches like very small camel-hair pencils. It does not fall off, nor does it turn grey until they are very old. Little, if any, hair is seen on the eyebrow. They would have a straggling beard, but scrupulously pull out every hair with tweezers made of mussel-shells.

'When discovered by strangers, the instant impulse of a family is to run off into the wood. After a short time, if nothing hostile is attempted by the intruders, and if they are not too numerous, the men return cautiously, making friendly signs, waving pieces of skins, rubbing and patting their bellies, and shouting. If all goes on quietly, the women frequently return, bringing with them the children; but they always leave the most valuable skins hidden in the bushes. This hasty concealment of seal or otter skins is the result of visits from sealers, who frequently robbed families of every skin in their possession, before the natives understood the motives of their expeditions in boats into the interior waters of Tierra del Fuego. Sometimes nothing will induce a single individual of the family to appear; men, women, and children hide in the thick woods, where it would be almost impossible to find them, and do not show themselves again until the strangers are gone; but during the whole time of their concealment a watchful look out is kept by them upon the motions of their unwelcome visitors.

'Scarcity of food, and the facility with which they move from one place to another in their canoes, are, no doubt, the reasons why the Fuegians are always so dispersed among the islands in small family parties, why they never remain long in one place, and why a large number are not seen many days in society. They never attempt to make use of the soil by any kind of culture; seals, birds, fish, and particularly

ticularly shell-fish, being their principal subsistence: any one place, therefore, soon ceases to supply the wants of even one family.

'In a few places, where the meeting of tides causes a constant supply of fish, especially porpoises, and where the land is broken into multitudes of irregular islets and rocks, whose shores afford an almost inexhaustible quantity of shell-fish, a few families may be found at one time, numbering altogether among them from twenty to forty souls: but even those approaches towards association are rare, and those very families are so migratory by nature, that they do not remain many months in such a spot, however productive it may be, but go wandering away among the numerous secluded inlets or sounds of their country, or repair to the outer sea-coast in search of seals, a dead whale, or fragments of some wrecked ship. During the summer they prefer the coast, as they then obtain a great quantity of eggs and young birds, besides seal, which come ashore to breed at that season; and in the winter they retire more into the interior waters in search of shell-fish, and the small but numerous and excellent fish which they catch among the sea-weed (kelp).'—*Fitz-Roy*, vol. ii. pp. 175-178.

There is a striking wildness about the following passage, opening with its Zamiel-like giant:—

'A great black man is supposed to be always wandering about the woods and mountains, who is certain of knowing every word and every action; who cannot be escaped; and who influences the weather according to men's conduct. York related a curious story of his own brother, who had committed a murder. "In woods of my country," said he, "some men go about alone; very wild men—have no belly (meaning, probably, that they were very thin)—live by stealing from other men." He then went on to say that his brother had been getting birds out of a cliff, and, on coming down, hid them among some long rushes, and went away. Soon afterwards he returned, and, seeing feathers blown away by the wind from the spot, suspected what was going on; so taking a large stone in his hand, he crept stealthily towards the place, and there saw one of these wild men plucking a bird which he had got out of the cliff. Without saying a word, he dashed the stone at the wild man's head, and killed him on the spot. Afterwards York's brother was very sorry for what he had done, particularly when it began to blow very hard. York said, in telling the story,—"Rain come down—snow come down—hail come down—wind blow—blow—very much blow. Very bad to kill man. Big man in woods no like it—he very angry." At the word "blow," York imitated the sound of a strong wind; and he told the whole story in a very low tone of voice, and with a mysterious manner, considering it an extremely serious affair.'—vol. ii. p. 180.

Of the cannibalism of these most desolate savages there can, we apprehend, be no doubt:—

'From the concurring testimony of the three Fuegians above-mentioned, obtained from them at various times and by many different persons, it is proved that they eat human flesh upon particular occasions, namely,

namely, when excited by revenge or extremely pressed by hunger. Almost always at war with adjoining tribes, they seldom meet but a hostile encounter is the result; and then those vanquished and taken are killed and eaten by the conquerors. The arms and breast are eaten by the women; the men eat the legs; and the trunk is thrown into the sea. During a severe winter hunger impels them to lay hands on the oldest woman of their party, hold her head over a thick smoke, and choke her. They then devour every particle of the flesh, not excepting the trunk, as in the former case. Jemmy Button, in telling this horrible story as a great secret, seemed to be much ashamed of his countrymen, and said, he never would do so—he would rather eat his own hands. When asked why the dogs were not eaten, he said, "Dog catch iappo" (iappo means otter).'—vol. ii. p. 183.

The Captain gives also the evidence of his friend Mr. Low:—

'Mr. Low had a boy on board the Adeona, who learned to speak English very tolerably during eighteen months that he stayed as a pilot and interpreter. This boy was of the Chonos tribe, and had never been south of Magalhaens Strait before he embarked with Mr. Low. He said, that in cases of extreme distress, caused by hunger, human flesh was eaten, and that when they had recourse to such food the oldest woman invariably suffered. The poor creatures escaped to the woods, if possible at such a time, but were soon found and brought back by force. They were killed by suffocation, their heads being held over the thick smoke of a fire made of green wood, and their throats squeezed by the merciless hands of their own relations. This boy imitated the piercing cries of the miserable victims whom he had seen sacrificed. He also mentioned that the breasts, belly, hands, and feet were most liked. When first questioned on this subject he showed no reluctance in answering any questions about it; but after a time, perceiving how much shocked his English companions were at the story, and how much disgust it excited among the crew of the vessel, he refused to talk of it again.'—vol. ii. p. 189.

The time for landing Captain Fitz-Roy's Fuegians now drew near, and it is curious to observe the effect produced upon them by the tribes still in a state of nature, and the high ground they took. 'York laughed heartily,' says the captain, 'at the first we saw, calling them large monkeys;' he named them 'Yapoos' by the way, though whether he had read of the Dean's Yahoos we know not.

'Jemmy assured us they were not at all like his people, who were very good and very clean. Fuegia was shocked and ashamed! She hid herself, and would not look at them a second time. It was interesting to observe the change which three years only had made in their ideas, and to notice how completely they had forgotten the appearance and habits of their former associates: for it turned out that Jemmy's own tribe was as inferior in every way as the worst of those whom he and York called "monkeys—dirty—fools—not men."'—vol. ii. p. 203.

York, it appears, had now cast the eyes of affection on Miss Basket,

Basket, and became jealous in all the moods and tenses of that passion: at last he was so much quizzed about her, that the good captain was obliged to interfere between him and one of his steadiest friends.

At length the party reached Woollȳa, Jemmy's much-vaunted home; and, as all were much pleased with its situation—it looks quite romantic in the engraving—he was very proud of the praises bestowed upon it. Here Captain Fitz-Roy resolved to establish his Fuegians, and to make an attempt, at least, to form a missionary settlement under a Mr. Matthews.

'Rising gently from the water-side, there are considerable spaces of clear pasture land, well watered by brooks, and backed by hills of moderate height, where we afterwards found woods of the finest timber trees in the country. Rich grass and some beautiful flowers, which none of us had ever seen, pleased us when we landed, and augured well for the growth of our garden seeds.'—vol. ii. p. 208.

The captain's little camp was now formed and a boundary line established: this, as the natives thronged to it, at first, it was difficult to make them keep sacred, but by good temper on the part of his men, the distribution of several presents, and the broken explanations of his dark-coloured shipmates, he succeeded in getting the natives squatted around the line and prevented encroachment. Our fair readers will now be preparing their cambric—but, alas! for unsophisticated humanity!

'Canoes continued to arrive;—a deep voice was heard shouting from one more than a mile distant: up started Jemmy from a bag full of nails and tools which he was distributing, leaving them to be scrambled for by those nearest, and, upon a repetition of the shout, exclaimed "My brother!" He then told me that it was his eldest brother's voice, and perched himself on a large stone to watch the canoe, which approached slowly, being small and loaded with several people. When it arrived, instead of an eager meeting, there was a cautious circumspection which astonished us. Jemmy walked slowly to meet the party, consisting of his mother, two sisters, and four brothers. The old woman hardly looked at him before she hastened away to secure her canoe and hide her property, all she possessed—a basket containing tinder, firestone, paint, &c., and a bundle of fish. The girls ran off with her without even looking at Jemmy; and the brothers (a man and three boys) stood still, stared, walked up to Jemmy, and all round him, without uttering a word. Animals when they meet show far more animation and anxiety than was displayed at this meeting. Jemmy was evidently much mortified; and to add to his confusion and disappointment, as well as my own, he was unable to talk to his brothers, except by broken sentences, in which English predominated. After a few minutes had elapsed, his elder brother began to talk to him; but although Jemmy understood what was said, he could not reply. York and

and Fuegia were able to understand some words, but could not or did not choose to speak.'—vol. ii. pp. 209, 210.

Still all things went on in a friendly manner, and Jemmy passed the evening with his mother and brothers in their wigwams, but returned to sleep. York also, and Fuegia, were going about among the natives, and the good effect was visible in the confident, familiar manner of the throng which surrounded the captain and his people, as they began to dig the ground for gardens, and cut wood for large wigwams, in which Matthews and his party were to be established.

The garden was planted with potatoes, carrots, turnips, peas, cabbages, onions, and other esculents, while Captain Fitz-Roy stayed; and after a short departure, during which he suffered much anxiety—not mitigated by the remarks made in his hearing, that Matthews would never be seen alive again—it was with no small joy that the captain, as he rounded a point of land in his boat on his return, saw the object of his fears quietly carrying a kettle to the fire near his wigwam. On landing, every thing was found wearing a fair aspect, and as nothing had occurred to damp the spirits of Matthews, a further trial was determined on: the yawl and one whale-boat were sent back to the Beagle, and Captain Fitz-Roy set out on a westward excursion, accompanied by Mr. Darwin and Mr. Hamond in the other two boats, his intention being to complete the exploration of Whale-boat Sound and the north-west arm of the Beagle Channel; then to revisit Woollȳa, either leave or remove Matthews, as might appear advisable, and afterwards repair to the ship in Goree Road.

During the very few days of this last absence the appearance of things at Woollȳa had become very much altered for the worse; and the sanguine temperament of the missionary probationer had lost its buoyancy.

'Matthews gave a bad account of the prospect which he saw before him, and told me that he did not think himself safe among such a set of utter savages as he found them to be. No violence had been committed beyond holding down his head by force, as if in contempt of his strength; but he had been harshly threatened by several men, and, from the signs used by them, he felt convinced they would take his life. During the last few days, his time had been altogether occupied in watching his property. At first there were only a few quiet natives about him, who were inoffensive; but three days after our departure several canoes full of strangers to Jemmy's family arrived, and from that time Matthews had had no peace by day, and very little rest at night.'

We pass over some painful details.

'The next difficulty was how to get Matthews' chest and the remainder of his property safely into our boats, in the face of a hundred Fuegians, who would of course understand our object, and be much

much more than a match for us on land: but the less hesitation shown, the less time they would have to think of what we were about: so, dividing our party, and spreading about a little to create confidence, at a favourable moment the wigwam was quickly cleared, the cave emptied, and the contents safely placed in our boats. As I stood watching the proceedings, a few anxious moments passed, for any kind of skirmish would have been so detrimental to the three who were still to remain. When the last man was embarked, I distributed several useful articles, such as axes, saws, gimblets, knives, and nails, among the natives, then bade Jemmy and York farewell, promising to see them again in a few days, and departed from the wondering throng assembled on the beach.'—vol. ii. pp. 220-222.

This was in February, 1833. In March, 1834, these places were revisited; and in that short period the Fuegians, upon whom such care had been bestowed, had relapsed very nearly into their original wild state. We leave Captain Fitz-Roy to draw the picture:—

'The wigwams in which I had left York, Jemmy, and Fuegia were found empty, though uninjured: the garden had been trampled over, but some turnips and potatoes of moderate size were pulled up by us, and eaten at my table, a proof that they may be grown in that region. Not a living soul was visible anywhere; the wigwams seemed to have been deserted many months; and an anxious hour or two passed, after the ship was moored, before three canoes were seen in the offing, paddling hastily towards us, from the place now called Button Island. Looking through a glass I saw a face which I knew, yet could not name. "It must be some one I have seen before," said I, when his sharp eye detected me, and a sudden movement of the hand to his head (as a sailor touches his hat) at once told me it was indeed Jemmy Button—but how altered! He was naked, like his companions, except a bit of skin about his loins; his hair was long and matted, just like theirs; he was wretchedly thin, and his eyes were affected by smoke. We hurried him below, clothed him immediately, and in half an hour he was sitting with me at dinner in my cabin, using his knife and fork properly, and in every way behaving as correctly as if he had never left us. He spoke as much English as ever, and, to our astonishment, his companions, his wife, his brothers, and their wives, mixed broken English words in their talking with him. Jemmy recollected every one well, and was very glad to see them all. I thought he was ill, but he surprised me by saying that he was "hearty, sir, never better," that he had not been ill, even for a day, was happy and contented, and had no wish whatever to change his way of life. He said that he got "plenty fruits"—(excrescences on the birch trees, and berries),—"plenty birdies," "ten guanaco in snow time," and "too much fish." Besides, though he said nothing about her, I soon heard that there was a good-looking young woman in his canoe, who was said to be his wife. Directly this became known, shawls, handkerchiefs, and a gold-laced cap appeared, with which she was speedily decorated; but fears had been excited for her husband's safe

safe return to her, and no finery could stop her crying until Jemmy again showed himself on deck. While he was below, his brother Tommy called out in a loud tone, "Jemmy Button, canoe, come!" After some time the three canoes went ashore, laden with presents, and their owners promised to come again early next morning. Jemmy gave a fine otter skin to me, which he had dressed and kept purposely: another he gave to Bennett.

'Next morning Jemmy told me that York and Fuegia left him some months before our arrival, and went in a large canoe to their own country: the last act of that cunning fellow was to rob poor Jemmy of all his clothes, tools, and other necessaries. Fuegia was dressed as usual, and looking well, when they decamped: her helpmate was also well clothed, and had hardly lost anything I left with him. Jemmy said, "York very much jaw," "pick up big stones," "all men afraid." Fuegia seemed to be very happy. Jemmy asserted that she helped to "catch (steal) his clothes," while he was asleep, the night before York left him naked.'—p. 325.

The result of further inquiries was this,—

'I am now quite sure that from the time of his desiring to be placed at Woollya, with Matthews and Jemmy, York meditated taking a good opportunity of possessing himself of every thing; and that he thought, if he were left in his own country without Matthews, he would not have many things given to him, neither would he know where he might afterwards look for and plunder poor Jemmy.'

This relapse is rendered more striking by a spirited plate, giving the portrait of Jemmy Button in 1833, confronted with his likeness in 1834. It is painfully interesting to observe how the erect head and intellectual bearing of the former date have sunk into the savage slouch and grossly animal expression of the creature opposite. This is a melancholy lesson, and, indeed, the whole story carries its moral with it. Man is not to be civilized *per saltum:* a long period must elapse, and many phases must be gone through, before the savage becomes the citizen. That Captain Fitz-Roy's views were the offspring of the purest benevolence no one can doubt: but his visions melted before stern reality; and we fear that the last state of these poor people must have been worse than the first. The almost forlorn hope to which he clings as he leaves his Fuegians for ever is thus expressed:—

'I cannot help still hoping that some benefit, however slight, may result from the intercourse of these people with other natives of Tierra del Fuego. Perhaps a shipwrecked seaman may hereafter receive help and kind treatment from Jemmy Button's children—prompted, as they can hardly fail to be, by the traditions they will have heard of men of other lands; and by an idea, however faint, of their duty to God as well as their neighbour.'—vol. ii. p. 327.

The opinion entertained by the Geographical Society of the importance

importance of this last expedition is expressed by that body when they state that the royal premium was awarded to Captain Fitz-Roy 'for his recent survey of the coast of South America, from the entrance of the Rio de la Plata, on the east coast, to the port of Guayaquil, on the coast of Peru—for the zeal, energy, and liberality shown by him in the conduct of the survey—and for the various geographical discoveries made by him during its progress, as well as in the circumnavigation of the globe.' To which we have only to add—

'He won it well; and may he wear it long.'

Mr. Darwin's volume, though last not least, next offers itself to our notice. Upon its merits there can be no two opinions. It is up to the science of the day, and, in some instances, beyond it. There are, indeed, no illustrations to this book, but we find ample materials for deep thinking: we have the vivid description that fills the mind's eye with brighter pictures than painter can present, and the charm arising from the freshness of heart which is thrown over these virgin pages of a strong intellectual man and an acute and deep observer.

This article would be protracted to an inordinate length without doing anything like justice to the work, were we not to confine ourselves here to a mere outline, to be filled up hereafter, we hope, when the *Zoology of the Beagle*, upon which so many of Mr. Darwin's excellent observations bear, and which is now in the course of publication, shall be brought to a conclusion.

Some idea may be formed of the vastness of the subjects with which Mr. Darwin so ably deals, when we direct attention to the palæontology of South America, and the rapidity with which materials have of late poured in upon us. Before Captain Fitz-Roy's expedition, the *Megatherium* and the *Megalonyx* seem to have been the only South American extinct forms recognised with any degree of clearness; and indeed much uncertainty hung about the latter. The Beagle, through the activity of Mr. Darwin, brought home remains which at once added three new genera of large *Edentata*, and two of *Pachydermata*—one, *Toxodon Platensis*, a gigantic and most interesting extinct mammiferous animal, with affinities to the *Rodentia*, *Edentata*, and herbivorous *Cetacea*: the other, not less interesting, *Macrauchenica Patachonica*, a large extinct mammifer, with affinities to the *Ruminantia*, and especially to the *Camelidæ*. Scarcely had Mr. Owen's accurate pen characterised these ancient forms,* when the discoveries of M. Lund between the Rio das Velhas, one of the confluents of the

* In 1838 the Wollaston medal was awarded to Professor Owen for his services to Fossil Zoology in general, and in particular for the description of Fossil Mammalia, collected by Mr. Darwin.

Rio

Rio de San Francisco and the Rio Paraopeba, opened to us an absolute wilderness of extinct animal forms, many of them gigantic, belonging to the families *Effodientia, Bradypoda, Pachydermata, Ruminantia, Feræ, Marsupialia, Glires,* and *Simiæ*—to say nothing of *Cheiroptera,* &c. We shall, upon another occasion, have something to say of this grand addition; but here only observe that there are ten new species of *Feræ,* among them a *Cynailurus,* or hunting leopard, and an *Hyæna,* both old-world forms, and twenty-one species of *Glires* or Rodents, most of which are new genera. Be it remembered that this multitude of families, genera, and species belong to the *extinct* zoology only of this portion of the globe. We need say no more of the impossibility of discussing the general zoology of that vast tract here.

But it is not to zoology alone that Mr. Darwin has contributed. The opinion entertained of his labours in a sister science by those best qualified to judge of it is thus declared, from the Chair of the Geological Society, by its reverend and learned President: —'Looking at the general mass of Mr. Darwin's results, I cannot help considering his voyage round the world as one of the most important events for *geology* which has occurred for many years. We may think ourselves fortunate that Captain Fitz-Roy, who conducted the expedition, was led, by his enlightened zeal for science, to take out a naturalist with him.'

Let us take a rapid survey of some of Mr. Darwin's important contributions to geological dynamics, as the President of the society aptly denominates the science—so far as we can frame a science —of the causes of change by which geological phenomena have been produced.

Almost every voyager has been struck with astonishment at the lagoon islands,—rings of land rising out of the depths of great oceans, and of which a good idea may be formed from the characteristic sketch of Whitsunday Island in Beechey's voyage. These are admirably described by Mr. Darwin.

'The annular reef of this lagoon island [Keeling] is surmounted in the greater part of its length by linear islets. On the northern side there is an opening, through which vessels reach the anchorage. On entering, the scene was very curious and rather pretty: its beauty, however, being solely dependant on the brilliancy of the surrounding colours. The shallow, clear, and still water of the lagoon, resting in its greater part on white sand, is, when illuminated by a vertical sun, of a most vivid green. This brilliant expanse, several miles in width, is on all sides divided, either from the dark heaving water of the ocean by a line of snow-white breakers, or from the blue vault of heaven by the strips of land, crowned at an equal height by the tops of the cocoa-nut trees. As a white cloud here and there affords a pleasing contrast with

the azure sky, so in the lagoon dark bands of living coral appear through the emerald-green water.

'The next morning after anchoring, I went on shore on Direction Island. The strip of dry land is only a few hundred yards wide; on the lagoon side we have a white calcareous beach, the radiation from which in such a climate is very oppressive; and on the outer coast, a solid broad flat of coral rock, which serves to break the violence of the open sea. Excepting near the lagoon where there is some sand, the land is entirely composed of rounded fragments of coral. In such a loose, dry, stony soil the climate of the intertropical regions alone could produce a vigorous vegetation. On some of the smaller islets, nothing could be more elegant than the manner in which the young and full-grown cocoa-nut trees, without destroying each other's symmetry, were mingled into one wood. A beach of glittering white sand formed a border to these fairy spots.

'I will now give a sketch of the natural history of these islands, which, from its very paucity, possesses a peculiar interest. The cocoa-nut tree, at the first glance, seems to compose the whole wood: there are, however, five or six other kinds. One of these grows to a very large size, but, from the extreme softness of its wood, is useless; another sort affords excellent timber for ship-building. Besides the trees, the number of plants is exceedingly limited, and consists of insignificant weeds. In my collection, which includes, I believe, nearly the perfect Flora, there are twenty species, without reckoning a moss, lichen, and fungus. To this number two trees must be added; one of which was not in flower, and the other I only heard of. The latter is a solitary tree of its kind in the whole group, and grows near the beach, where, without doubt, the one seed was thrown up by the waves. I do not include in the above list the sugar-cane, banana, some other vegetables, fruit-trees, and imported grasses. As these islands consist entirely of coral, and at one time probably existed as a mere water-washed reef, all the productions now living here must have been transported by the waves of the sea. In accordance to this, the Flora has quite the character of a refuge for the destitute: Professor Henslow informs me that, of the twenty species, nineteen belong to different genera, and these again to no less than sixteen orders!'—*Darwin*, pp. 540, 541.

The explanation of the origin of these islands most generally received is, that they are based on the craters of volcanos. When we reflect, however, on their vast number, their proximity, and their great size, (especially in the case of the *Atolls* in the Indian sea, one of which is about eighty miles in length, with an average width of only about twenty,*) we agree with Mr. Darwin, that this view can hardly be considered correct. There is another class of reefs, in some respects even more remarkable than those forming lagoon islands, and which may be termed encircling reefs, such as are mentioned by our author at p. 555. The moat,

* One of the Radack islands of Kotzebue is fifty-two miles long by twenty broad.

as

as it may be called, surrounding the mountainous island Vanikoro, which lifts its head like the castle of some giant of romance, and frowns over the spot where La Peyrouse was shipwrecked, is even more than 300 feet deep, though Mr. Darwin gives the depths as being within those numbers. The great circular coral wall, built by myriads of minute architects, ascends sheer and steep on both sides. 'Externally,' says Mr. Darwin, 'the reef rises from an ocean profoundly deep. The structure is analogous to that of a lagoon, but with an island standing, like a picture in its frame, in the middle.'

Of the construction of these encircling reefs what explanation can be given? No one, as far as we are aware, has hitherto attempted it with anything like success. It is hardly to be supposed that reef-building *polypi* of very different genera should act in concert. Why should the reef spring up at the distance of miles from the shore, and from a great depth, whilst we know that reefs—the instances are innumerable—grow attached to the shore?

Mr. Darwin believes that this problem receives a simple explanation, from the fact, that while the land slowly subsides from changes in progress in the subterranean regions, the reefs of living coral continue to grow to the surface. The line of argument which seems to have led him to this conclusion we shall state; but first let us remind those of our readers who may be only partially acquainted with the progress of recent geological inquiry, that proofs of the rise of the land have come in from all quarters of the world. If, then, the globe be not absolutely swelling like the frog in the fable, which no one will grant, there must be tracts which have lately undergone subsidence, or are undergoing it. In ancient times such movements of subsidence have taken place, attested, as every geologist knows, by the vertical trees in the Portland dirt-beds, the alternations of fresh-water and marine deposits, &c. &c.

Mr. Darwin, then, having these facts in his mind, seems to have been led to consider how it comes that enormous areas of deep ocean (p. 558) are studded with low coral islands, and yet that many facts shew that reef-building *polypi* do not flourish at greater depths than twenty fathoms at most. What foundation, then, have these coral islands in spaces of many thousand square leagues of a deep, deep ocean? Must we suppose that there are as many submarine mountains as coral islands, all rising within twenty fathoms of the surface of the ocean, and not one above it? Such a supposition will be rejected as monstrous. The only possible alternative then, as it seems to us, is, that 'as each point, one after the other, according to its altitude, was submerged, the

coral grew upwards, and formed the many islets now standing at one level.' (p. 558.)

Mr. Darwin next considers whether the peculiar structure of the lagoon islands and encircling reefs occurring in these oceans, which he is forced by the foregoing argument to believe have subsided, receives any explanation from this movement. He says, in substance,—let an island fringed with coral reefs very gradually subside, will not the necessary effect of this be, that although the reef may grow upwards and reach the surface, it will not be so with the land, which will gradually be submerged? Then, according to the amount of subsidence so will the width of the channel be between the reef and shore. If the sinking continue, the encircled island, by the gradual submergence of the last and highest peak, will be converted into a lagoon island. Mr. Darwin then observes (p. 599), that the non-filling up of the interior basin of the lagoon, on the open channel within the encircling reef, is due to those stations being unfavourable (partly owing to the sand and mud drifted about) to the growth of the massive corals. He proceeds to state that a series can be shown from an annular reef, encircling either one or several small islands, to a lagoon island which merely encircles a sheet of water; and he insists that the difference between the various kinds of reefs (p. 556) entirely lies in the absence or presence of neighbouring land, and the relative position which the reefs bear to it. Mr. Darwin, therefore, supposes that as a reef fringing an island is converted by subsidence into an encircled one, so a reef fringing the shore of a continent will be converted into a barrier reef (p. 559), like that extraordinary one on the N.E. coast of Australia, separated from the land by a wide arm of the sea; and there the reefs (p. 564) supposed to be produced by the same kind of movement are found in juxtaposition. The reefs of New Caledonia exhibit a step between an encircling and a barrier reef.

Mr. Darwin seems to think that, if this theory be rejected, not only must the origin of lagoon islands encircling a barrier of reefs, and their presence in one part and entire absence in another, remain altogether without explanation,—which, considering their vast number and uniformity of structure, would be not a little remarkable;—but that all the facts showing that reef-building *polypi* will not live at great depths must be rejected; for we must then suppose that the reefs have sprung up from submarine mountains, which we cannot grant, over spaces of many thousand square leagues. If, on the other hand, this theory, which includes under one head the origin of the several reefs, be admitted, very important deductions must follow from it: for it shows that great

great portions of the surface of the globe have recently (in a geological sense) undergone movements of subsidence (which it must always be extremely difficult to detect by any direct evidence); and what is even more worthy of note, it shows that the movements have been so far gradual, that no one sinking down has carried the reef below the small depth from which the *polypi* could rear it to the surface again. So far so good: but Mr. Darwin alludes to even more extended inferences, which we shall not notice, as the subject will soon be treated of by him at full length.

The climate of the Southern hemisphere, considered with reference to organic natural productions, is most remarkable as compared with corresponding latitudes in Europe.

'Although so inhospitable to our feelings, and to most of the plants from the warmer parts of Europe, yet it is most favourable to the native vegetation. The forests, which cover the entire country between the latitudes of 38° and 45°, rival in luxuriance those of the glowing intertropical regions. Whilst in Chiloe (lat. 42°) I could almost have fancied myself in Brazil. Stately trees of many kinds, with smooth and highly-coloured barks, are loaded by parasitical plants of the monocotyledonous structure; large and elegant ferns are numerous; and arborescent grasses intwine 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 grass very like a bamboo in 40°; and another closely-allied kind, of great length, but not erect, even as far south as 45°.

'In another part of this same hemisphere, which has so uniform a character, owing to its large proportional area of sea, Forster found parasitical orchideous plants living south of lat. 45° in New Zealand. Tree-ferns thrive luxuriantly near Hobart Town, in Van Diemen's Land. I measured one there which was exactly six feet in circumference; and its height from the ground to the base of the fronds appeared to be very little under twenty. Mr. Brown says "an arborescent species of the same genus (*Dicksonia*) was found by Forster, in New Zealand, at Dusky Bay, in nearly 46° S., the highest latitude in which tree-ferns have yet been observed. It is remarkable that, although they have so considerable a range in the southern hemisphere, no tree-fern has been found beyond the northern tropic: a distribution in the two hemispheres somewhat similar to this has been already noticed respecting the Orchideæ that are parasitical on trees."

'Even in Tierra del Fuego, Captain King describes the "vegetation thriving most luxuriantly, and large woody-stemmed trees of Fuchsia and Veronica, in England considered and treated as tender plants, in full flower, within a very short distance of the base of a mountain covered for two-thirds down with snow, and with the temperature at 36°." He states, also, that humming-birds were seen sipping the sweets of the flowers, "after two or three days of constant rain, snow, and sleet, during which time the thermometer had been at the freezing point." I myself

myself have seen parrots feeding on the seeds of the winter's bark, south of latitude 55°.'—vol. iii. pp. 271, 272.

The low descent of the snow line in the southern parts of South America, and even in lat. 41°, together with its sudden flexure in Southern Chile (see p. 277), is also very remarkable; for it involves as a consequence the descent of glaciers of enormous dimensions into the sea, in lat. 20° nearer the equator than in the northern hemisphere (p. 285). Mr. Darwin insists on the importance of this fact in connexion with the high southerly range of tropical forms above noticed, as throwing great light on the distribution of erratic bowlders, a problem which has deeply interested almost every geological observer,—particularly those who have crossed the Jura—but even such as have only examined the midland counties of England. Mr. Murchison, a shrewd judge of the value of such observations, in his excellent chapter on bowlders (*Silurian System*, vol. i. p. 535), gives a highly favourable estimate of Mr. Darwin's researches. But since the publication of Mr. Murchison's great work, Mr. Darwin has added much to our means of defining the law of this intricate phenomenon, and has extended the theory in detail to the case of the bowlders in the Alps (pp. 289, 614, 615).

Before we quit this part of the subject we must lay before our readers Mr. Darwin's application of it to another most remarkable and hitherto difficult problem—the icy entombment of the Siberian animals. The close approach of the line of perpetual congelation with the limit of the extension of tropical forms has the most intimate connexion with this highly-interesting circumstance, and, in our opinion, goes far to change a great apparent anomaly into a normal fact.

'At the Ferroe islands (or we may say a little to the southward of the Wiljui, where Pallas found, in lat. 64° N., the frozen rhinoceros), a body buried under the surface of the soil would undergo so little decomposition, that years afterwards (as in the instance mentioned at South Shetland, 62°-63° S.) every feature might be recognised perfect and unchanged. I particularly allude to this circumstance, because the case of the Siberian animals preserved with their flesh in the ice offers the same apparent difficulty with the glaciers; namely, the union in the same hemisphere of a climate in some senses severe, with one allowing of the life of those forms which *at present*, although abounding *without* the tropics, do not approach the frozen zones.

'The perfect preservation of the Siberian animals perhaps presented, till within a few years, one of the most difficult problems which geology ever attempted to solve. On the one hand it was granted that the carcasses had not been drifted from any great distance by any tumultuous deluge, and on the other it was assumed as certain that, when the animals lived, the climate must have been so totally different, that the presence

sence of ice in the vicinity was as incredible, as would be the freezing of the Ganges. Mr. Lyell, in his "Principles of Geology," has thrown the greatest light on this subject, by indicating the northerly course of the existing rivers, with the probability that they formerly carried carcasses in the same direction; by showing (from Humboldt) how far the inhabitants of the hottest countries sometimes wander; by insisting on the caution necessary in judging of habits between animals of the same genus, when the species are not identical; and especially by bringing forward in the clearest manner the probable change from an insular to an extreme climate, as the consequence of the elevation of the land, of which proofs have lately been brought to light.

'In the former part of this volume, I have endeavoured to prove, that, as far as regards the *quantity* of food, there is no difficulty in supposing that these large quadrupeds inhabited sterile regions, producing but a scanty vegetation. . . . . I suppose no reason can be assigned why, during a former epoch, when the pachydermata abounded over the greater part of the world, some species should not have been fitted for the northern regions, precisely as now happens with deer and several other animals. If, then, we believe that the climate of Siberia, anteriorly to the physical changes above alluded to, had some resemblance with that of the southern hemisphere at the present day—a circumstance which harmonizes well with other facts, as I think has been shown by the imaginary case, when we transported existing phenomena from one to the other hemisphere—the following conclusions may be deduced as probable:—First, that the degree of cold formerly was not excessive; secondly, that snow did not for a long time together cover the ground (such not being the case at the extreme parts 55°-56° of S. America); thirdly, that the vegetation partook of a more tropical character than it now does in the same latitudes; and lastly, that at but a short distance to the northward of the country thus circumstanced (even not so far as where Pallas found the entire rhinoceros), the soil might be perpetually congealed: so that if the carcass of any animal should once be buried a few feet beneath the surface, it would be preserved for centuries.

'Both Humboldt and Lyell have remarked, that, at the present day, the bodies of any animals, wandering beyond the line of perpetual congelation, which extends as far south as 62°, if once embedded by any accident a few feet beneath the surface, would be preserved for an indefinite length of time: the same would happen with carcasses drifted by the rivers; and by such means the extinct mammalia may have been entombed. There is only one small step wanting, as it appears to me, and the whole problem would be solved with a degree of simplicity very striking, compared with the several theories first invented. From the account given by Mr. Lyell of the Siberian plains, with their innumerable fossil bones, the relics of many successive generations, there can be little doubt that the beds were accumulated either in a shallow sea, or in an estuary. From the description given in Beechey's voyage of Eschscholtz Bay, the same remark is applicable to the north-west coast of America: the formation there appears identical with the common littoral deposits recently elevated, which I have seen on the shores of

of the southern part of the same continent. It seems also well established, that the Siberian remains are only exposed where the rivers intersect the plain. With this fact, and the proofs of recent elevation, the whole case appears to be precisely similar to that of the Pampas: namely, that the carcasses were formerly floated into the sea, and the remains covered up in the deposits which were then accumulating. These beds have since been elevated; and as the rivers excavate their channels the entombed skeletons are exposed.

'Here, then, is the difficulty: how were the carcasses preserved at the bottom of the sea? I do not think it has been sufficiently noticed, that the preservation of the animal with its flesh was an occasional event, and not directly consequent on its position far northward. Cuvier refers to the voyage of Billing as showing that the *bones* of the elephant, buffalo, and rhinoceros are nowhere so abundant as on the islands between the mouths of the Lena and Indigirska. It is even said that, excepting some hills of rock, the whole is composed of sand, ice, and bones. The islands lie to the northward of the place where Adams found the mammoth with its flesh preserved, and even ten degrees north of the Wiljui, where the rhinoceros was discovered in a like condition. In the case of the *bones* we may suppose that the carcasses were drifted into a deeper sea, and, there remaining at the bottom, the flesh decomposed. But in the second and more extraordinary case, where putrefaction seems to have been arrested, the body probably was soon covered up by deposits which were then accumulating. It may be asked, whether the mud a few feet deep, at the bottom of a shallow sea which is annually frozen, has a temperature higher than 32°? It must be remembered how intense a degree of cold is required to freeze salt water; and that the mud at some depth below the surface would have a low mean temperature, precisely in the same manner as the subsoil on the land is frozen in countries which enjoy a short but hot summer. If this be possible, the entombment of these extinct quadrupeds is rendered very simple; and with regard to the conditions of their former existence, the principal difficulties have, I think, already been removed.' —vol. iii. pp. 293-298.

The whole of the chapter (xvi.) on volcanic phenomena, and the great earthquake at Concepçion, is admirably written. It brings absolutely before us the frightfully-gigantic powers of subterranean agency. We have reason to believe that Mr. Darwin means to justify what he has said upon this perilous subject in the forthcoming part of the Geological Transactions. One word as to the extent of the operations, and the comfortable position of the inhabitants:—

'The extent of country throughout which the subterranean forces were thus unequivocally displayed, measures 700 by 400 geographical miles. From several considerations, which I have not space here to enter on, and especially from the intermediate points whence liquefied matter was ejected, we can scarcely avoid the conclusion, however fearful it may be, that a vast lake of melted matter, of an area nearly doubling in

in extent that of the Black Sea, is spread out beneath a mere crust of solid land.'—vol. iii. p. 380.

A pleasant locality this for a building speculation!

But it is not to the scientific alone that Mr. Darwin's volume will prove highly interesting. The general reader will find in it a fund of amusement and instruction. Mr. Darwin is a first-rate landscape-painter with the pen. Even the dreariest solitudes are made to teem with interest. Nor less striking are his accounts of the state of society in South America, especially those which relate to the murderous hatred mutually felt and exercised towards each other by the aborigines and those whom they justly consider usurpers, but who look upon them more as wild beasts than fellow-men. An intelligent Spaniard gave him the following account of the last engagement at which he was present. It is a sickening example of 'man's inhumanity to man:'—

'Some Indians, who had been taken prisoners, gave information of a tribe living north of the Colorado. Two hundred soldiers were sent; and they first discovered the Indians by a cloud of dust from their horses' feet, as they chanced to be travelling. The country was mountainous and wild, and it must have been far in the interior, for the Cordillera was in sight. The Indians, men, women, and children, were about one hundred and ten in number, and they were nearly all taken or killed, for the soldiers sabre every man. The Indians are now so terrified, that they offer no resistance in a body, but each flies, neglecting even his wife and children; but when overtaken, like wild animals, they fight against any number to the last moment. One dying Indian seized with his teeth the thumb of his adversary, and allowed his own eye to be forced out, sooner than relinquish his hold. Another, who was wounded, feigned death, keeping a knife ready to strike one more fatal blow. My informer said, when he was pursuing an Indian, the man cried out for mercy, at the same time that he was covertly loosing the bolas from his waist, meaning to whirl it round his head, and so strike his pursuer. "I however struck him with my sabre to the ground, and then got off my horse, and cut his throat with my knife." This is a dark picture; but how much more shocking is the unquestionable fact, that all the women who appear above twenty years old are massacred in cold blood. When I exclaimed that this appeared rather inhuman, he answered, "Why, what can be done? They breed so!"—pp. 119, 120.

'Who,' exclaims our author, 'would believe in this age, in a civilised country, that such atrocities were committed?' But they *are* committed, and upon a race who are not without the highest manly qualities. The stern virtue of an ancient Roman could not have surpassed the heroism here recorded:—

'In the battle four men ran away together. They were pursued, and one was killed, but the other three were taken alive. They turned out

out to be messengers or ambassadors from a large body of Indians, united in the common cause of defence, near the Cordillera. The tribe to which they had been sent was on the point of holding a grand council; the feast of mare's flesh was ready, and the dance prepared: in the morning the ambassadors were to have returned to the Cordillera. They were remarkably fine men, very fair, above six feet high, and all under thirty years of age. The three survivors of course possessed very valuable information; and to extort this they were placed in a line. The two first being questioned, answered, "No se" (I do not know), and were one after the other shot. The third also said, "No se;" adding, "Fire, I am a man, and can die!" Not one syllable would they breathe to injure the united cause of their country!'—pp. 120, 121.

We must not be tempted farther:—here we close an imperfect notice of one of the most interesting narratives of voyaging that it has fallen to our lot to take up, and which must always occupy a distinguished space in the history of scientific navigation.

ART. VIII.—1. *Austria and the Austrians.* In 2 vols. London. 1837.

2. *Hungary and Transylvania, with Remarks on their Condition, Social, Political, and Economical.* By John Paget, Esq. In 2 vols. London. 1839.

3. *Austria.* By Peter Evan Turnbull, Esq., F.R.S., F.S.A. In 2 vols. London. 1839.

4. *Germany, Bohemia, and Hungary, visited in* 1837. By the Rev. G. R. Gleig, A.M., Chaplain to the Royal Hospital, Chelsea. In 3 vols. London. 1839.

5. *Vienna and the Austrians, with some Account of a Journey through Swabia, Bavaria, the Tyrol, and the Salzbourg.* By Frances Trollope. In 2 vols. London. 1838.

WE start on our present expedition into Austria with a company as varied, though not quite so numerous, as that which set forth with Chaucer on his memorable pilgrimage to Canterbury. We have, first, a regular London book-maker, who fills a chapter on Austrian aristocracy with an account of Mad. B. Constant's Parisian *soirée*, and illustrates the Vienna stage by sixteen pages about Schiller's Mary Stuart;—secondly, a gentleman in the transition state between an English squire and an Hungarian Freyherr—exhibiting spirit, cleverness, and a dash of chivalry, based on the solid foundation of information and good sense;—thirdly, a grave F.R.S., loaded with foreign statistics enough to make Dr. Bowring jealous, and foreign political information

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