Charles Darwin's Shorter Publications 1829–1883

1829–1832. [Records of captured insects]. In Stephens, J. F., *Illustrations of British entomology; or, a synopsis of indigenous insects* etc. London: Baldwin & Cradock, vols. 1–5. F1968[1]

Haustellata vol. 2 (appendix) (1 June 1829)

|200| Graphiphora plecta. "Cambridge." – *C. Darwin, Esq*.

Mandibulata vol. 2 (appendix) (15 June 1829)

|188| Ocys tempestivus. "Cambridge." – *C. Darwin, Esq*.

|190| Elaphrus uliginosus. "Cambridge, in plenty, 1829." – *C. Darwin, Esq*.

|191| Blethisa multipunctata "In great abundance near Cambridge in 1829." – *C. Darwin, Esq*.

Haliplus elevatusa "Near Cambridge, 1829." – *C. Darwin, Esq*.

Hygrotus scitulus "Near Cambridge." – *C. Darwin, Esq*.

|192| Hydroporus areolatus "Cambridge." – *C. Darwin, Esq*.

|194| Colymbetes pulverosus "In profusion near Cambridge." – *C. Darwin, Esq*.

Colymbetes notatus "In abundance near Cambridge." – *C. Darwin, Esq*.

Colymbetes exoletus "Abundantly near Cambridge." – *C. Darwin, Esq*.

Colymbetes agilis "In profusion near Cambridge in 1829." – *C. Darwin, Esq*.

Colymbetes adspersus "Plentiful near Cambridge in 1829." – *C. Darwin, Esq*.

|195| Hydaticus hybneri "Near Cambridge, 1829." – *C. Darwin, Esq*.

Dytiscus (Leionotus) conformis "Near Cambridge, not rare, 1829." – *C. Darwin, Esq*.

Mandibulata vol. 3 (30 April 1830)

|7| [Ptomaphagus] anisotomoides "Shropshire." – *C. Darwin, Esq*.

[Ptomaphagus] wilkinii "Salop." – *C. Darwin, Esq*.

|9| [Catops] sericeus "Cambridge and Salop." – *C. Darwin, Esq*.

|14| [Choleva] angustata "North Wales." – *C. Darwin, Esq*.

[Choleva] agilis "North Wales." – *C. Darwin, Esq*.

|19| Ne[crophorus] interruptus "Found with the preceeding [vestigator] but occurs much less frequently." – *Rev. L. Jenyns and C. Darwin Esq*.

|33| [Nitidulaa] punctatissima "Shropshire." – *C. Darwin, Esq*.

|38| Ni[tidula] obsoleta "Cambridgeshire and North Wales." – *C. Darwin, Esq*.

|41| Ni[tidula] limbata "North Wales." – *C. Darwin, Esq*.
|79| Cr[yptophagus] typhae "Cambridgeshire and North Wales." – *C. Darwin, Esq*.
|104| [Crypta] bipunctata "Near Cambridge." – *C. Darwin, Esq*.
|154| Hi[ster] quadristriatus "Barmouth." – *Rev F. W. Hope, and C. Darwin, Esq*.
|182| [Geotrupes] laevis "Barmouth and North Wales." – *Rev F. W. Hope and C. Darwin, Esq*.
|242| [Trachys] pygmaea "Cambridge." – *C. Darwin, Esq*.
|266| [Darwin is mentioned, though not quoted, in a note on *Ctenicerus cupreus*, as captured by C. Darwin, Esq. et al in North Wales]
|279| [Campylus] linearis "Woods near Cambridge." – *C. Darwin, Esq*.

Mandibulata vol. 4 (1831)

|118| [Otiorhynchus] atroapterus "Barmouth." – *Rev F. W. Hope and C. Darwin, Esq*.
|274| [Donacia] nigra "Near Cambridge." – *C. Darwin, Esq*.

Mandibulata (appendix) vol. 5 (1832)

|394| Col. branchiatus. Taken in North Wales by C. Darwin, Esq.

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[1] CD was very proud when, as a student at Christ's College, Cambridge, his name appeared in James Francis Stephens (1792–1852), *Entomology*. As CD later recalled in his *Autobiography* (pp. 62–3):

> But no pursuit at Cambridge was followed with nearly so much eagerness or gave me so much pleasure as collecting beetles. It was the mere passion for collecting, for I did not dissect them and rarely compared their external characters with published descriptions, but got them named anyhow. I will give a proof of my zeal: one day, on tearing off some old bark, I saw two rare beetles and seized one in each hand; then I saw a third and new kind, which I could not bear to lose, so that I popped the one which I held in my right hand into my mouth. Alas it ejected some intensely acrid fluid, which burnt my tongue so that I was forced to spit the beetle out, which was lost, as well as the third one.
>
> I was very successful in collecting and invented two new methods; I employed a labourer to scrape during the winter, moss off old trees and place [it] in a large bag, and likewise to collect the rubbish at the bottom of the barges in which reeds are brought from the fens, and thus I got some very rare species. No poet ever felt more delight at seeing his first poem published than I did at seeing in Stephen's *Illustrations of British Insects* the magic words, "captured by C. Darwin, Esq."

It has been remarked that this exact wording was not printed in Stephens. But the entry in 3: 266 reads: 'captured by the Rev. F. W. Hope and C. Darwin, Esq., in North Wales'. There are 92 words quoted from CD in 31 entries, with a further two entries naming him as the collector but without quotation. See Freeman 1977 and *Darwin's insects*.

[1835]. [Extracts from letters addressed to Professor Henslow]. Cambridge: [privately printed]. F1

For Private Distribution[1]

The following pages contain Extracts from letters addressed to Professor Henslow[2] by C. Darwin, Esq. They are printed for distribution among the Members of the Cambridge Philosophical Society, in consequence of the interest which has been excited by some of the Geological notices which they contain, and which were read at a Meeting of the Society on the 16th of November 1835.

The opinions here expressed must be viewed in no other light than as the first thoughts which occur to a traveller respecting what he sees, before he has had time to collate his Notes, and examine his Collections, with the attention necessary for scientific accuracy.

Cambridge,
Dec. 1, 1835. |2| |3|

Extracts,
&c.

Rio de Janeiro, *May* 18, 1832.

We started from Plymouth on the 27th December 1831—At St Jago[3] (Cape de Verd Islands) we spent three weeks. The geology was pre-eminently interesting, and I believe quite new: there are some facts on a large scale, of upraised coast that would interest Mr. Lyell.[4]

St Jago is singularly barren, and produces few plants or insects; so that my hammer was my usual companion.

On the coast I collected many marine animals, chiefly gasteropodous mollusca (I think some new). I examined pretty accurately a Caryophyllia,[5] and, if my eyes were not bewitched, former descriptions have |4| not the slightest resemblance to the animal. I took several specimens of an Octopus, which possessed a most marvellous power of changing its colours; equalling any chamelion, and evidently accommodating the changes to the colour of the ground which it passed over.

We then sailed for Bahia, and touched at the rock of St Paul. This is a serpentine formation.

After touching at the Abrothos,[6] we arrived here on April 4th.

A few days after arriving, I started on an expedition of one hundred and fifty miles to Rio Macao,[7] which lasted eighteen days.

I am now collecting fresh water and land animals: if what was told me in London is true, viz. that there are no small insects in the collections from the Tropics, I tell entomologists to look out and have their pens ready for describing. I have taken as minute (if not more so) as in England, Hydorpori, Hygroti, Hydrobii, Pselaphi, Staphylini, Curculiones, Bembidia, &c. &c. It is exceedingly interesting to observe the difference of genera and species from those which I know; it is however much less than I had expected. |5|

I have just returned from a walk, and as a specimen how little the insects are known, Noterus, according to Dic. Class.[8] consists solely of three European species. I, in one haul of my net, took five distinct species.

At Bahia, the pegmatite and gneiss in beds had the same direction as was observed by Humboldt[9] to prevail over Columbia, distant thirteen hundred miles.

Monte Video, *Aug*. 15, 1832.

My collection of plants from the Abrothos is interesting, as I suspect it contains nearly the whole flowering vegetation.

I made an enormous collection of Arachnidæ at Rio. Also a good many small beetles in pill-boxes: but it is not the best time of year for the latter.

Amongst the lower animals, nothing has so much interested me as finding two species of elegantly coloured planariæ[10] (?) inhabiting the dry forest! The false relation they bear to snails is the most extraordinary thing of the kind I have ever seen. In the same genus (or more truly, family) some of the marine species possess an organization so marvellous, |6| that I can scarcely credit my eyesight. Every one has heard of the discoloured streaks of water in the equatorial regions. One I examined was owing to the presence of such minute Oscillatoria,[11] that in each square inch of surface there must have been at least one hundred thousand present.

I might collect a far greater number of specimens of invertebrate animals if I took up less time over each: but I have come to the conclusion, that two animals with their original colour and shape noted down, will be more valuable to naturalists than six with only dates and place.

At this present minute we are at anchor in the mouth of the river: and such a strange scene it is. Every thing is in flames—the sky with lightning—the water with luminous particles—and even the very masts are pointed with a blue flame.

Monte Video, *Nov.* 24, 1832.

We arrived here on the 24th of October, after our first cruize on the coast of Patagonia, north of the Rio Negro. |7|

I had hoped for the credit of dame Nature, no such country as this last existed; in sad reality we coasted along two hundred and forty miles of sand hillocks; I never knew before, what a horrid ugly object a sand hillock is: the famed country of the Rio Plata in my opinion is not much better; an enormous brackish river bounded by an interminable green plain is enough to make any naturalist groan.

I have been very lucky with fossil bones; I have fragments of at least six distinct animals; as many of these are teeth, shattered and rolled as they have been, I trust they will be recognized. I have paid all the attention I am capable of, to their geological site; but of course it is too long a story for a letter. 1st. the tarsi and meta-tarsi, very perfect, of a cavia;[12] 2d. the upper jaw and head of some very large animal, with four square hollow molars, and the head greatly produced in front. I at first thought it belonged either to the megalonyx or megatherium.[13] In confirmation of this, in the same formation, I found a large surface of the osseous polygonal plates, which "late observations" (what are they?) have shewn to belong to the megatherium. Immediately I saw them I thought they must belong to an enormous armadillo, living species of which genus are so abundant here. 3d. The lower jaw of some large animal, which, from the molar teeth I should think belonged to the edentata;[14] 4th. large molar teeth, which in some |8| respects would seem to belong to some enormous species of rodentia; 5th. also some smaller teeth belonging to the same order, &c. &c.—They are mingled with marine shells, which appear to me identical with existing species. But since they were deposited in their beds, several geological changes have taken place in the country.

There is a poor specimen of a bird, which to my unornithological eyes, appears to be a happy mixture of a lark, pigeon, and snipe. Mr Mac Leay[15] himself never imagined such an inosculating[16] creature.

I have taken some interesting amphibia; a fine bipes;[17] a new Trigonocephalus,[18] in its habits beautifully connecting Crotalus[19] and Viperus:[20] and plenty of new (as far as my knowledge goes) saurians. As for one little toad, I hope it may be new, that it may be christened "diabolicus." Milton must allude to this very individual, when he talks of "squat like a toad."[21]

Amongst the pelagic crustaceæ, some new and curious genera. Among Zoophites some interesting animals. As for one Flustra,[22] if I had not the specimen to back me, nobody would believe in its most anomalous structure. But as for novelty, all this is nothing to a family of pelagic animals, which at first sight appear like Medusa, but are really highly organized. |9| I have examined them repeatedly, and certainly from their structure it would be impossible to place them in any existing order. Perhaps Salpa[23] is the nearest animal; although the transparency of the body is almost the only character they have in common.

We have been at Buenos Ayres for a week. It is a fine large city; but such a country; every thing is mud; you can go no where, you can do nothing for mud. In the city I obtained much information about the banks of the Uruguay. I hear of limestone with shells, and beds of shells in every direction.

I purchased fragments of some enormous bones, which I was assured belonged to the former giants!!

April 11, 1833.

We are now running up from the Falkland Islands to the Rio Negro (or Colorado.)

It is now some months since we have been at a civilized port; nearly all this time has been spent in the most southern part of Tierra del Fuego. It is a detestable place; gales succeed gales at such short intervals, that it is difficult to do any thing. We were twenty-three days off Cape Horn, and could |10| by no means get to the westward.—We at last ran into harbour, and in the boats got to the west of the inland channels.—With two boats we went about three hundred miles; and thus I had an excellent opportunity of geologizing and seeing much of the savages. The Fuegians are in a more miserable state of barbarism than I had expected ever to have seen a human being. In this inclement country they are absolutely naked, and their temporary houses are like those which children make in summer with boughs of trees.

The climate in some respects is a curious mixture of severity and mildness; as far as regards the animal kingdom the former character prevails; I have in consequence not added much to my collections. The geology of this part of Tierra del Fuego was to me very interesting. The country is non-fossiliferous, and a common-place succession of granitic rocks and slates: attempting to make out the relation of cleavage, strata, &c. &c. was my chief amusement.

The Southern ocean is nearly as sterile as the continent it washes. Crustaceæ have afforded me most work.

I found a Zoea,[24] of most curious form, its body being only one-sixth the length of the two spears. I am convinced, from its structure and other reasons, it is |11| a young Erichthus.[25] I must mention part of the structure of a Decapod,[26] it is so very anomalous: the last pair of legs are small and dorsal, but instead of being terminated by a claw, as in all others, it has three curved bristle-like appendages; these are finely serrated and furnished with cups, somewhat resembling those of the Cephalopods. The animal being pelagic, this beautiful structure enables it to hold on to light floating objects. I have found out something about the propagation of that ambiguous tribe the Corallines. After leaving Tierra del Fuego, we sailed to the Falklands.

I had here the high good fortune to find amongst the most primitive looking rocks, a bed of micaceous sandstone, abounding with Terebratula[27]and its sub-genera, and Entrochites.[28] As this is so remote a locality from Europe, I think the comparison of these impressions with those of the oldest fossiliferous rocks of Europe will be pre-eminently interesting.[29] Of course they are only models and casts; but many of them are very perfect.

Rio de la Plata, *July* 18, 1833.

The greater part of the winter has been passed in this river at Meldonado.[30] |12|

We have got almost every bird in this neighbourhood, (Meldonado) about eighty in number, and nearly twenty quadrupeds.

In a few days we go to the Rio Negro to survey some banks.

The geology must be very interesting. It is near the junction of the Megatherium and Patagonian cliffs. From what I saw of the latter, in one half hour, in St Joseph's bay, they would be well worth a long examination. Above the great oyster-bed there is one of gravel, which fills up inequalities in its interior; and above this, and therefore high out of the water, is one of such modern shells that they retain their colour and emit a bad smell when burnt. Patagonia must clearly have lately risen from the water.

Monte Video, *November* 12, 1833.

I left the Beagle at the Rio Negro, and crossed by land to Buenos Ayres. There is now carrying on a bloody war of extermination against the Indians, by which I was able to make this passage. But at the best it is sufficiently dangerous, and till now very rarely travelled. It is the most wild, dreary plain imaginable, without settled inhabitant or head of |13| cattle. There are military "postas" at wide intervals, by which means I travelled. We lived for many days on deer and ostriches, and had to sleep in the open camp.

I had the satisfaction of ascending the Tierra de la Ventana, a chain of mountains between three and four thousand feet high, the very existence of which is scarcely known beyond the Rio Plata. After resting a week at Buenos Ayres, I started for St Fé. On the road the geology was interesting. I found two great groups of immense bones, but so very soft as to render it impossible to remove them. I think, from a fragment of one of the teeth, they belonged to the Mastodon.[31] In the Rio Carcarana, I got a tooth which puzzles even my conjectures. It looks

like an enormous gnawing one. At St Fé, not being well, I embarked and had a fine sail of three hundred miles down that princely river the Parana. When I returned to Buenos Ayres, I found the country upside down with revolutions, which caused me much trouble. I at last got away and joined the Beagle.

E. Falkland Island, *March*, 1834.

I have been alarmed by your expression "cleaning all the bones," as I am afraid the printed numbers will be lost: the reason I am so anxious they should |14| not be, is, that a part were found in a gravel with recent shells, but others in a very different bed. Now with these latter there were bones of an Agouti,[32] a genus of animals, I believe, peculiar to America, and it would be curious to prove that some one of the same genus coexisted with the megatherium; such, and many other points entirely depend on the numbers being carefully preserved.

I collected all the plants which were in flower on the coast of Patagonia, at Port Desire, and St Julian; also on the eastern parts of Tierra del Fuego, where the climate and features of Tierra del Fuego and Patagonia are united.

The soil of Patagonia is very dry, gravelly, and light. In East Tierra, it is gravelly, peaty, and damp. Since leaving the Rio Plata I have had some opportunities of examining the great southern Patagonian formation. I have a good many shells; from the little I know of the subject, it must be a tertiary formation, for some of the shells (and corallines) now exist in the sea. Others, I believe, do not. This bed, which is chiefly characterized by a great oyster, is covered by a very curious bed of porphyry pebbles, which I have traced for more than seven hundred miles. But the most curious fact is, that the whole of the east coast of the southern part of South America has been elevated from the ocean, since a period during which |15| muscles have not lost their blue colour. At Port St Julian I found some very perfect bones of some large animal, I fancy a Mastodon: the bones of one hind extremity are very perfect and solid. This is interesting, as the latitude is between 49° and 50°, and the site far removed from the great Pampas, where bones of the narrow toothed Mastodon are so frequently found. By the way this Mastodon and the Megatherium, I have no doubt, were fellow brethren in the ancient plains. Relics of the Megatherium I have found at a distance of nearly six hundred miles in a north and south line. In Tierra del Fuego I have been interested in finding some sort of ammonite (also I believe found by Capt. King)[33] in the slate near Port Famine; and on the eastern coast there are some curious alluvial plains, by which the existence of certain quadrupeds in the islands can clearly be accounted for. There is a sandstone with the impression of leaves like the common beech tree; also modern shells, &c., and on the surface of the table land there are, as usual, muscles with their blue colour, &c.

I have chiefly been employed in preparing myself for the South Sea, and examining the polypi of the smaller corallines in these latitudes. Many in themselves are very curious, and I think undescribed: there was one appalling one, allied to a Flustra, which I dare say I mentioned having found to the northward, where |16| the cells have a moveable organ (like a vulture's head, with a dilatable beak), fixed on the edge. But what is of more general

interest, is the unquestionable (as it appears to me) existence of another species of ostrich[34] besides the Struthio ostrea. All the Gauchos and Indians state it is the case: and I place the greatest faith in their observations. I have the head, neck, and piece of skin, feathers, and legs of one. The differences are chiefly in the colour of the feathers and scales; in the legs being feathered below the knees; also in its modification, and geographical distribution.

Valparaiso, *July* 24, 1834.

After leaving the Falklands, we proceeded to the Rio Santa Cruz; followed up the river till within twenty miles of the Cordilleras:[35] unfortunately want of provisions compelled us to return. This expedition was most important to me, as it was a transverse section of the great Patagonian formation. I conjecture (an accurate examination of the fossils may possibly determine the point) that the main bed is somewhere about the meiocene period (using Mr Lyell's expression); judging from what I have seen of the present shells of Patagonia. This bed contains an enormous mass of lava. This is of some |17| interest, as being a rude approximation to the age of the volcanic part of the great range of the Andes. Long before this it existed as a slate and porphyritic line of hills. I have collected a tolerable quantity of information respecting the various periods and forms of elevations of these plains. I think these will be interesting to Mr Lyell. I had deferred reading his third volume till my return; you may guess how much pleasure it gave me; some of his wood-cuts came so exactly into play, that I have only to refer to them, instead of redrawing similar ones.

The valley of Santa Cruz appears to me a very curious one; at first it quite baffled me. I believe I can shew good reasons for supposing it to have been once a northern strait, like that of Magellan.

In Tierra del Fuego I collected and examined some corallines: I have observed one fact which quite startled me. It is, that in the genus Sertularia[36] (taken in its most restricted form as by Lamouroux),[37] and in two species which, excluding comparative expressions, I should find much difficulty in describing as different, the polypi quite and essentially differed in all their most important and evident parts of structure. I have already seen enough to be convinced that the present families of corallines, as arranged by Lamarck,[38] Cuvier,[39] &c. are highly artificial. It appears to me, that they are in the same |18| state in which shells were, when Linnæus[40] left them for Cuvier to re-arrange. It is most extraordinary I can no where see in my books a single description of the polypus of any one coral (excepting Lobularia (Alcyonium) of Savigny).[41] I found a curious little stony Cellaria (a new genus), each cell provided with a long toothed bristle capable of various and rapid motions. This motion is often simultaneous, and can be produced by irritation. This fact, as far as I see, is quite isolated in the history (excepting of the Flustra, with an organ like a vulture's head) of Zoophites. It points out a much more intimate relation between the polypi, than Lamarck is willing to allow. I forget whether I mentioned having seen something of the manner of propagation in that most ambiguous family, the corallines: I feel pretty well convinced that if they are not plants, they are not Zoophites: the "gemmule" of a Halimeda contains several articulations united, ready to burst their envelope and become attached to some

basis. I believe that in Zoophites universally, the gemmule produces a single polypus, which afterwards or at the same time grows with its cell, or single articulation. The Beagle left the strait of Magellan in the middle of winter: she found her road out by a wild unfrequented channel; well might Sir J. Nasborough[42] call the west coast South Desolation, "because it is so desolate a land |19| to behold." We were driven into Chiloe, by some very bad weather. An Englishman gave me three specimens of that very fine lucanoidal insect,[43] which is described in the Cambridge Philosophical Transactions,[44] two males and one female. I find Chiloe is composed of lava and recent deposits. The lavas are curious, from abounding with or rather being composed of pitchstone.

We arrived here the day before yesterday; the views of the distant mountains are most sublime and the climate delightful: after our long cruise in the damp gloomy climates of the South, to breathe a clear dry air, and feel honest warm sunshine, and eat good fresh roast beef, must be the summum bonum of human life. I do not like the looks of the rocks half so much as the beef, there is too much of those rather insipid ingredients, mica, quartz, and feldspar.

Shortly after arriving here I set out on a geological excursion, and had a very pleasant ramble about the base of the Andes. The whole country appears composed of breccias, (and I imagine slates) which universally have been modified, and often completely altered by the action of fire; the varieties of porphyry thus produced are endless, but no where have I yet met with rocks which have flowed in a stream; dykes of greenstone are very numerous. Modern volcanic action is entirely shut up in the |20| very central parts (which cannot now be reached on account of the snow) of the Cordilleras. To the south of the Rio Maypo, I examined the tertiary plains already partially described by M. Gay.[45] The fossil shells appear to me to differ more widely from the recent ones, then in the great Patagonian formation; it will be curious if an eocene and meiocene formation (recent there is abundance of) could be proved to exist in South America as well as in Europe. I have been much interested by finding abundance of recent shells at an elevation of thirteen hundred feet; the country in many places is scattered over with shells, but these are all *littoral* ones! So that I suppose the thirteen hundred feet elevation must be owing to a succession of small elevations, such as in 1822. With these certain proofs of the recent residence of the ocean over all the lower parts of Chili, the outline of every view and the form of each valley possesses a high interest. Has the action of running water or the sea formed this ravine? was a question which often arose in my mind, and was generally answered by my finding a bed of recent shells at the bottom. I have not sufficient arguments, but I do not believe that more than a small fraction of the height of the Andes has been formed within the tertiary period. |21|

Valparaiso, *March* 1835.

We are now lying becalmed off Valparaiso, and I will take the opportunity of writing a few lines to you. The termination of our voyage is at last decided on. We leave the coast of America in the beginning of September, and hope to reach England in the same month of 1836.

You will have heard an account of the dreadful earthquake of the 20th of February. I wish some of the geologists, who think the earthquakes of these times are trifling, could see the way in which the solid rock is shivered. In the town there is not one house habitable; the ruins remind me of the drawings of the desolated eastern cities. We were at Valdivia at the time, and felt the shock very severely. The sensation was like that of skating over very thin ice; that is, distinct undulations were perceptible. The whole scene of Concepcion and Talcuana is one of the most interesting spectacles we have beheld since leaving England. Since leaving Valparaiso, during this cruise, I have done little excepting in geology. In the modern tertiary strata I have examined four bands of disturbance, which reminded me on a small scale of the famous tract in the Isle of Wight. In one spot there were beautiful examples of three different forms of upheaval. In two cases I think I can show that the inclination is owing to the presence |22| of a system of parallel dykes traversing the inferior mica slate. The whole of the coast from Chiloe to the south extreme of the Peninsula of Tres Montes is composed of the latter rock; it is traversed by very numerous dykes, the mineralogical nature of which will, I suspect, turn out very curious. I examined one grand transverse chain of granite, which has clearly burst up through the overlying slate. At the Peninsula of Tres Montes there has been an old volcanic focus, which corresponds to another in the north part of Chiloe. I was much pleased at Chiloe by finding a thick bed of recent oyster-shells, &c. capping the tertiary plain, out of which grew large forest trees. I can now prove that both sides of the Andes have risen in this recent period to a considerable height. Here the shells were three hundred and fifty feet above the sea. In Zoology I have done but very little; excepting a large collection of minute diptera and hymenoptera from Chiloe. I took in one day, Pselaphus, Anaspis, Latridius, Leiodes, Cercyon, and Elmis, and two beautiful true Carabi; I might have fancied myself collecting in England. A new and pretty genus of nudibranch mollusca which cannot crawl on a flat surface, and a genus in the family of balanidæ,[46] which has not a true case, but lives in minute cavities in the shells of the concholepas,[47] are nearly the only two novelties.

|23| Valparaiso, *April* 18, 1835.

I have just returned from Mendoza, having crossed the Cordilleras by two passes. This trip has added much to my knowledge of the geology of the country.

I will give a very short sketch of the structure of these huge mountains. In the Portillo pass (the more southern one) travellers have described the Cordilleras to consist of a double chain of nearly equal altitude, separated by a considerable interval. This is the case: and the same structure extends northward to Uspellata.[48] The little elevation of the eastern line (here not more than six thousand or seven thousand feet) has caused it almost to be overlooked. To begin with the western and principal chain, where the sections are best seen; we have an enormous mass of a porphyritic conglomerate resting on granite. This latter rock seems to form the nucleus of the whole mass, and is seen in the deep lateral valleys, injected amongst, upheaving, overturning in the most extraordinary manner, the overlying strata. On the bare sides of the mountains, the complicated dykes and wedges of variously coloured rocks,