THE PRESIDENT'S ADDRESS.

Gentlemen,

The loss of our most illustrious Member, Charles Robert Darwin, which occurred on the 19th of April last, is still fresh in our recollections. Born on the 12th February, 1809, he was educated successively at Shrewsbury, Edinburgh, and Cambridge.

In the case of any one who has achieved greatness, it is always interesting to search in his early career for the first indications of his future celebrity; it becomes, so to speak, an embryological study of the mental development.

Through the kindness of our excellent Secretary, Mr. Fitch, I have been favoured with a few lines written by one of our still living Original Members on the subject of Charles Darwin leaving Cambridge in 1831. This was in a letter addressed by the Rev. Leonard Jenyns (now Rev. Leonard Blomefield) to James Francis Stephens, April 11th, 1831. It was as follows:—

"Swaffham Bulbeck, April 11th.

"My dear Stephens,

". . . . Darwin, I am sorry to say, has taken his degree, so that we are likely to lose him soon at Cambridge altogether, which I shall very much regret, he having assisted me greatly in working out the Cambridgeshire insects, and proved so very diligent a collector; though I have not yet been able to induce him to extend his enquiries beyond the order of Coleoptera. He comes up for one more term this spring, I believe solely for entomological purposes, and I mean that we should do a great deal together during that time. . . . .

"Yours very sincerely,

"L. Jenyns."

Before the close of that same year (1831) Charles Darwin had sailed in the 'Beagle,' then bound on a surveying voyage, and he did not return to this country till October 2nd, 1836, having been away nearly five years.

There is no doubt that in the observations made during that voyage, and the reflections thereby occasioned, we may trace the germs of nearly all his later writings. It has therefore appeared to me desirable that the Entomological Notes, in his 'Journal of Researches,' which are, I am sorry to say, few and far between, should be put together collectively; and, bearing in mind that these observations were all made before the writer had attained the demure age of 28, this record of his youth can scarcely fail to interest those who are now regretting his death in his 74th year.

St. Paul's Rocks, a small islet which rises abruptly from the depths of the Atlantic, 540 miles from the coast of South America, was visited February 16th, 1832. The highest point is only fifty feet above the level of the sea, and the entire circumference is under three-quarters of a mile.

"Not a single plant, nor even a lichen grows on this islet; yet it is inhabited by several insects and spiders. The following list completes, I believe, the terrestrial fauna:—A fly (*Olfersia*) living on the booby, and a tick which must have come here as a parasite on the birds; a small brown moth belonging to a genus that feeds on feathers; a beetle (*Quedius*), and a woodlouse from beneath the dung; and lastly, numerous spiders, which, I suppose, prey on these small attendants and scavengers of the waterfowl.

"The often-repeated description of the stately palm and other noble tropical plants, their birds, and lastly, man, taking possession of the coral islets as soon as formed in the Pacific, is probably not quite correct; I fear it destroys the poetry of this story, that feather and dirt-feeding and parasitic insects and spiders should be the first inhabitants of newly-formed oceanic land."

Rio de Janeiro was visited April 4th, 1832, and, in making an excursion thence more than a hundred miles into the interior,

there was noticed "an intricate wilderness of lakes, in some of which were fresh, in others salt-water shells. Of the former kind I found a *Limnæa* in great numbers in a lake, into which the inhabitants assured me that the sea enters once a year, and sometimes oftener, and makes the water quite salt. I have no doubt many interesting facts, in relation to marine and fresh-water animals, might be observed in this chain of lagoons, which skirt the coast of Brazil. M. Gay has stated that he found, in the neighbourhood of Rio, shells of the marine genera *Solen* and *Mytilus* and fresh-water *Ampullariæ* living together in brackish water. I also frequently observed, in the lagoon near the Botanic Garden, where the water is only a little less salt than in the sea, a species of *Hydrophilus*, very similar to a water-beetle common in the ditches of England; in the same lake the only shell belonged to a genus generally found in estuaries."

Whilst staying at Rio, Mr. Darwin resided in a cottage at Botofogo Bay, close beneath the well-known mountain of the Corcovado. Here, "the climate during the months of May and June [1832], or at the beginning of winter, was delightful. The mean temperature . . . . was only 72°. It often rained heavily, but the drying southerly winds soon again rendered the walks pleasant. . . . . After the hotter days it was delicious to sit quietly in the garden and watch the evening pass into night. Nature, in these climes, chooses her vocalists from more humble performers than in Europe. A small frog, of the genus *Hyla*, sits on a blade of grass about an inch above the surface of the water, and sends forth a pleasing chirp; when several are together they sing in harmony on different notes. . . . Various *Cicadæ* and crickets at the same time keep up a ceaseless shrill cry, but which, softened by the distance, is not unpleasant. Every evening after dark this great concert commenced, and often have I sat listening to it, until my attention has been drawn away by some curious passing insect.

"At these times the fire-flies are seen flitting about from hedge to hedge. On a dark night the light can be seen at about two hundred paces distant. It is remarkable that in all the different kinds of glow-worms, shining Elaters, and various marine animals (such as the Crustacea, *Medusæ*, *Nereidæ*, a coralline of the genus *Clytia*, and *Pyrosoma*) which I have

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

"When we were at Bahia an *Elater* or beetle (*Pyrophorus luminosus*, Illig.) seemed the most common luminous insect. The light in this case was also rendered more brilliant by irritation. I amused myself one day by observing the springing powers of this insect, which have not, as it appears to me, been properly described. The *Elater*, when placed on its back and preparing

to spring, moved its head and thorax backwards, so that the pectoral spine was drawn out, and rested on the edge of its sheath. The same backward movement being continued, the spine, by the full action of the muscles, was bent like a spring ; and the insect at this moment rested on the extremity of its head and wing-cases. The effort being suddenly relaxed, the head and thorax flew up, and in consequence the base of the wing-cases struck the supporting surface with such force that the insect, by the reaction, was jerked upwards to the height of one or two inches. The projecting points of the thorax and the sheath of the spine served to steady the whole body during the spring. In the descriptions which I have read sufficient stress does not appear to have been laid on the elasticity of the spine; so sudden a spring could not be the result of simple muscular contraction without the aid of some mechanical contrivance."

Whilst at Rio during the summer of 1832 a visit to the forest is thus mentioned :—" This day I found a specimen of a curious fungus called *Hymenophallus*. Most people know the English *Phallus*, which in autumn taints the air with its odious smell ; this, however, as the entomologist is aware, is to some of our beetles a delightful fragrance. So was it here, for a *Strongylus*, attracted by the odour, alighted on the fungus as I carried it in my hand. We here see in two distant countries a similar relation between plants and insects of the same families, though the species of both are different. When man is the agent in introducing into a country a new species, this relation is often broken ; as one instance of this I may mention that the leaves of the cabbages and lettuces, which in England afford food to such a multitude of slugs and caterpillars, in the gardens near Rio are untouched.

"During our stay at Brazil I made a large collection of insects. A few general observations on the comparative importance of the different orders may be interesting to the English entomologist. The large and brilliantly-coloured Lepidoptera bespeak the zone they inhabit far more plainly than any other race of animals. I allude only to the butterflies, for the moths, contrary to what might have been expected from the rankness of the vegetation, certainly appeared in much fewer numbers than in our own temperate regions. I was much surprised at the

habits of *Papilio feronia*. This butterfly is not uncommon, and generally frequents the orange-groves. Although a high flyer, yet it very frequently alights on the trunks of trees. On these occasions its head is invariably placed downwards, and its wings are expanded in a horizontal plane, instead of being folded vertically, as is commonly the case. This is the only butterfly which I have ever seen that uses its legs for running. Not being aware of this fact, the insect, more than once, as I cautiously approached with my forceps, shuffled on one side just as the instrument was on the point of closing, and thus escaped. But a far more singular fact is the power which this species possesses of making a noise. Several times when a pair, probably male and female, were chasing each other in an irregular course, they passed within a few yards of me, and I distinctly heard a clicking noise, similar to that produced by a toothed wheel passing under a spring catch. The noise was continued at short intervals, and could be distinguished at about twenty yards' distance. I am certain there is no error in the observation.*

"I was disappointed in the general aspect of the Coleoptera. The number of minute and obscurely-coloured beetles is exceedingly great. The cabinets of Europe can, as yet, boast only of the larger species from tropical climates. It is sufficient to disturb the composure of an entomologist's mind, to look forward to the future dimensions of a complete catalogue. (I may mention, as a common instance of one day's (June 23rd) collecting, when I was not attending particularly to the Coleoptera, that I caught sixty-eight species of that order. Among these there were only two of the *Carabidæ*, four *Brachelytra*, fifteen *Rhynchophora*, and fourteen of the *Chrysomelidæ*. Thirty-seven species of *Arachnidæ*, which I brought home, will be sufficient to prove that I was not paying overmuch attention to the generally favoured order of Coleoptera).

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* In the Proceedings of this Society, March 3rd, 1845, Transations IV., cxxiii., we read:—"Mr. Edward Doubleday mentioned that he had recently examined *Peridromia Feronia*, the butterfly described by Mr. C. Darwin in his 'Tour,' as making a noise during flight like the rustling of parchment, and that he had detected a small membranous sac at the base of the fore-wings, with a structure along the subcostal nervure like an Archimedean screw or diaphragm in the tracheæ, especially at the dilated base of the wing."

"The carnivorous beetles, or *Carabidæ*, appear in extremely few numbers within the tropics: this is the more remarkable when compared to the case of the carnivorous quadrupeds, which are so abundant in hot countries. I was struck with this observation both on entering Brazil, and when I saw the many elegant and active forms of the *Harpalidæ* re-appearing on the temperate plains of La Plata. Do the very numerous spiders and rapacious Hymenoptera supply the place of the carnivorous beetles? The carrion-feeders and *Brachelytra* are very uncommon; on the other hand, the *Rhynchophora* and *Chrysomelidæ*, all of which depend on the vegetable world for subsistence, are present in astonishing numbers. I do not here refer to the number of different species, but to that of the individual insects; for on this it is that the most striking character in the entomology of different countries depends. The orders Orthoptera and Hemiptera are particularly numerous; as likewise is the stinging division of the Hymenoptera; the bees, perhaps, being excepted. A person, on first entering a tropical forest, is astonished at the labours of the ants; well-beaten paths branch off in every direction, on which an army of never-failing foragers may be seen, some going forth and others returning, burdened with pieces of green leaf, often larger than their own bodies.

"A small dark-coloured ant sometimes emigrates in countless numbers. One day, at Bahia, my attention was drawn by observing many spiders, cockroaches, and other insects, and some lizards, rushing in the greatest agitation across a bare piece of ground. A little way behind, every stalk and leaf was blackened by a small ant. The swarm having crossed the bare space, divided itself, and descended an old wall. By this means many insects were fairly enclosed; and the efforts which the poor little creatures made to extricate themselves from such a death were wonderful. When the ants came to the road they changed their course, and in narrow files re-ascended the wall. Having placed a small stone so as to intercept one of the lines, the whole body attacked it, and then immediately retired. Shortly afterwards another body came to the charge, and again, having failed to make any impression, this line of march was entirely given up. By going an inch round, the file might have avoided the stone, and this doubtless would have happened, if it

had been originally there: but having been attacked, the lion-hearted little warriors scorned the idea of yielding.

"Certain wasp-like insects, which construct in the corner of the verandahs clay cells for their larvæ, are very numerous in the neighbourhood of Rio. These cells they stuff full of half-dead spiders and caterpillars, which they seem wonderfully to know how to sting to that degree as to leave them paralysed but alive until their eggs are hatched, and the larvæ feed on the horrid mass of powerless, half-killed victims—a sight which has been described by an enthusiastic naturalist as curious and pleasing!

"I was much interested one day by watching a deadly contest between a *Pepsis* and a large spider of the genus *Lycosa*. The wasp made a sudden dash at its prey, and then flew away: the spider was evidently wounded, for, trying to escape, it rolled down a little slope, but had still strength sufficient to crawl into a thick tuft of grass. The wasp soon returned, and seemed surprised at not immediately finding its victim. It then commenced as regular a hunt as ever hound did after fox; making short semicircular casts, and all the time rapidly vibrating its wings and antennæ. The spider, though well concealed, was soon discovered; and the wasp, evidently still afraid of its adversary's jaws, after much manœuvring, inflicted two stings on the underside of its thorax. At last, carefully examining with its antennæ the now motionless spider, it proceeded to drag away the body. But I stopped both tyrant and prey."

On the 6th of December, 1833, the 'Beagle' left the Rio Plata for the coast of Patagonia, and the occurrence of insects at sea is chronicled thus:—

"Several times when the ship has been some miles off the Plata, and other times when off the shores of Northern Patagonia, we have been surrounded with insects. One evening, when we were about ten miles from the Bay of San Blas, vast numbers of butterflies, in bands or flocks of countless myriads, extended as far as the eye could range. Even by the aid of a telescope it was not possible to see a space free from butterflies. The seamen cried out, 'it was snowing butterflies,' and such in fact was the appearance. More species than one were present, but the main part belonged to a kind very similar to, but not

identical with, the common English *Colias Edusa*. Some moths and Hymenoptera accompanied the butterflies, and a fine beetle (*Calosoma*) flew on board. Other instances are known of this beetle having been caught far out at sea, and this is the more remarkable, as the greater number of the Carabidæ seldom or never take wing. The day had been fine and calm, and the one previous to it equally so, with light and variable airs. Hence we cannot suppose that the insects were blown off the land, but we must conclude that they voluntarily took flight. The great bands of the *Colias* seem at first to afford an instance like those on record of the migrations of another butterfly, *Vanessa cardui*; but the presence of other insects makes the case distinct, and even less intelligible. Before sunset a strong breeze sprung up from the north, and this must have caused tens of thousands of the butterflies and other insects to have perished.

"On another occasion, when seventeen miles off Cape Corrientes, I had a net overboard to catch pelagic animals. Upon drawing it up, to my surprise, I found a considerable number of beetles in it, and although in the open sea they did not appear much injured by the salt water. I lost some of the specimens, but those which I preserved belonged to the genera *Colymbetes*, *Hydroporus*, *Hydrobius* (two species), *Notaphus*, *Cynucus*, *Adimonia* and *Scarabæus*. At first I thought that these insects had been blown from the shore, but upon reflecting that out of the eight species four were aquatic, and two others partly so in their habits, it appeared to me most probable that they were floated into the sea by a small stream which drains a lake near Cape Corrientes. On any supposition it is an interesting circumstance to find live insects swimming in the open ocean seventeen miles from the nearest point of land. There are several accounts of insects having been blown off the Patagonian shore. Captain Cook observed it, as did more lately Captain King in the 'Adventure.' The cause probably is due to the want of shelter, both of trees and hills, so that an insect on the wing, with an off-shore breeze, would be very apt to be blown out to sea. The most remarkable instance I have known, of an insect being caught far from the land, was that of a large grasshopper (*Acridium*), which flew on board when the 'Beagle' was to windward of the Cape de Verd Islands, and when the nearest

point of land, not directly opposed to the trade-wind, was Cape Blanco, on the coast of Africa, 370 miles distant."

On the 23rd December, 1833, Port Desire, on the coast of Patagonia, was reached.

"The Zoology of Patagonia is as limited as its Flora. On the arid plains a few black beetles (*Heteromera*) might be seen slowly crawling about, and occasionally a lizard darted from side to side."

One hundred and ten miles further south the 'Beagle' entered the spacious harbour of Port St. Julian, Patagonia, on the 9th January, 1834.

"Although we could nowhere find, during our whole visit, a single drop of fresh water, yet some must exist; for by an odd chance I found on the surface of the salt water, near the head of the bay, a *Colymbetes*, not quite dead, which must have lived in some not far distant pool. Three other insects (a *Cicindela*, like *hybrida*, a *Cymindis*, and a *Harpalus*, which all live on muddy flats occasionally overflowed by the sea), and one other found dead on the plain, complete the list of the beetles. A good-sized fly (*Tabanus*) was extremely numerous, and tormented us by its painful bite. . . . We have here the puzzle that so frequently occurs in the case of mosquitoes—on the blood of what animals do these insects commonly feed? The guanaco is nearly the only warm-blooded quadruped, and it is found in quite inconsiderable numbers compared with the multitude of flies."

Two visits were paid to Tierra del Fuego; one from December, 1832 to February, 1833; and the other from February to June, 1834; the following remarks on the insects occur:—

"Beetles occur in very small numbers: it was long before I could believe that a country as large as Scotland, covered with vegetable productions and with a variety of stations, could be so unproductive. The few which I found were alpine species (*Harpalidæ* and *Heteromera*), living under stones. The vegetable-

feeding *Chrysomelidæ*, so eminently characteristic of the tropics, are here almost entirely absent. (I believe I must except one alpine *Haltica* and a single specimen of a *Melasoma*). Mr. Waterhouse informs me that of the *Harpalidæ* there are eight or nine species, the forms of the greater number being very peculiar; of *Heteromera*, four or five species; of *Rhynchophora*, six or seven; and of the following families one species in each: *Staphylinidæ*, *Elateridæ*, *Cebrionidæ*, *Melolonthidæ*. The species in the other orders are even fewer. In all the orders the scarcity of the individuals is even more remarkable than that of the species. Most of the Coleoptera have been carefully described by Mr. Waterhouse in the 'Annals of Natural History.' I saw very few flies, butterflies, or bees, and no crickets or Orthoptera. In the pools of water I found but few aquatic beetles. . . I have already contrasted the climate as well as the general appearance of Tierra del Fuego with that of Patagonia, and the difference is strongly exemplified in the Entomology. I do not think they have one species in common; certainly the general character of the insects is widely different."

In January, 1835, the Chonos Archipelago, on the western coast of South America, was visited.

"Cryptogamic plants here find a most congenial climate. In the Straits of Magellan, as I have before remarked, the country appears too cold and wet to allow of their arriving at perfection; but in these islands, within the forest, the number of species and great abundance of mosses, lichens, and small ferns is quite extraordinary.

"By sweeping with my insect-net, I procured from these situations a considerable number of minute insects, of the family *Staphylinidæ*, and others allied to *Pselaphus*, and minute Hymenoptera. But the most characteristic family in number, both of individuals and species, throughout the more open parts of Chiloe and Chonos, is that of the *Telephoridæ*."

March 11th, 1835, Valparaiso was reached, and from this point an excursion was made over the Cordillera to Mendoza, which was two days' journey on the eastern side of the mountains. On the 25th March, when approaching Mendoza, we read:—

"After our two days' tedious journey, it was refreshing to see in the distance the rows of poplars and willows growing round the village and river of Luxan. Shortly before we arrived at this place, we observed to the south a ragged cloud of a dark reddish-brown colour. At first we thought it was smoke from some great fire on the plains, but we soon found that it was a swarm of locusts. They were flying northward, and with the aid of a light breeze they overtook us at a rate of ten or fifteen miles an hour. The main body filled the air from a height of twenty feet, to that, as it appeared, of two or three thousand above the ground; 'and the sound of their wings was as the sound of chariots of many horses running to battle,' or rather, I should say, like a strong breeze passing through the rigging of a ship. The sky, seen through the advanced guard, appeared like a mezzotinto engraving, but the main body was impervious to sight; they were not, however, so thick together but that they could escape a stick waved backwards and forwards. When they alighted they were more numerous than the leaves in the field, and the surface became reddish instead of being green: the swarm having once alighted, the individuals flew from side to side in all directions. Locusts are not at all an uncommon pest in this country; already, during this season, several smaller swarms had come up from the south, where, as apparently in all other parts of the world, they are bred in the deserts. The poor cottagers in vain attempted by lighting fires, by shouts, and by waving branches, to avert the attack. This species of locust closely resembles, and perhaps is identical with, the famous *Gryllus migratorius* of the East." . . .

"We slept in the village of Luxan, which is a small place surrounded by gardens, and forms the most southern cultivated district in the province of Mendoza; it is five leagues south of the capital. At night I experienced an attack (for it deserves no less a name) of the *Benchuca*, a species of *Reduvius*, the great black bug of the Pampas. It is most disgusting to feel soft wingless insects, about an inch long, crawling over one's body. Before sucking they are quite thin, but afterwards they become round and bloated with blood, and in this state are easily crushed. One which I caught at Iquique (for they are found in Chili and Peru) was very empty. When placed on a table, and though surrounded by people, if a finger was presented, the bold

insect would immediately protrude its sucker, make a charge, and if allowed draw blood. No pain was caused by the wound. It was curious to watch its body during the act of sucking, as in less than ten minutes it changed from being as flat as a wafer to a globular form. This one feast, for which the benchuca was indebted to one of the officers, kept it fat during four whole months; but after the first fortnight it was quite ready to have another suck."

The Galapagos Archipelago was visited between September 15th and October 20th, 1835, and though directly under the equator it was remarked that both the fauna and flora were dull.

"With the exception of a wren with a fine yellow breast, and of a tyrant flycatcher with a scarlet tuft and breast, none of the birds are brilliantly coloured, as might have been expected in an equatorial district. Hence it would appear probable that the same causes which here make the immigrants of some species smaller, make most of the peculiar Galapageian species also smaller, as well as very generally more dusky coloured. All the plants have a wretched, weedy appearance, and I did not see one beautiful flower. The insects, again, are small-sized and dull-coloured, and, as Mr. Waterhouse informs me, there is nothing in their general appearance which would have led him to imagine that they had come from under the equator. The birds, plants, and insects have a desert character, and are not more brilliantly coloured than those from Southern Patagonia; we may, therefore, conclude that the usual gaudy colouring of the intertropical productions is not related either to the heat or light of those zones, but to some other cause, perhaps to the conditions of existence being generally favourable to life." . . . .

"I took great pains in collecting the insects, but, excepting Tierra del Fuego, I never saw in this respect so poor a country. Even in the upper and damp region I procured very few, excepting some minute Diptera and Hymenoptera, mostly of common mundane forms. As before remarked, the insects, for a tropical region, are of very small size and dull colours. Of beetles I collected twenty-five species (excluding a *Dermestes* and *Corynetes*, imported wherever a ship touches); of these, two belong to the *Harpalidæ*,

two to the *Hydrophilidæ*, nine to three families of the Heteromera, and the remaining twelve to as many different families. This circumstance of insects (and I may add plants) where few in number belonging to many different families, is, I believe, very general."

Mr. Waterhouse, who described these insects from the Galapagos Islands in the 'Annals and Magazine of Nat. Hist.,' 1845, vol. xvi., pp. 19—41, remarks:—"The insects here described are nearly all of small size, and none of them display any brilliant colouring. Some of the species are referable to a little group found in Chili and Peru,—the genus *Ammophorus*,—a genus hitherto only found in those parts; others appertain to a genus (*Anchonus*) which is almost confined to the West Indian Islands and the northern parts of South America. Again, in the collection under consideration are species of genera which are found all over the world, or nearly so, such as *Feronia*, *Notaphus*, and *Oryctes;* and lastly, there are species which cannot be located in any known *genus*, but which appertain to *families* having representatives in most parts of the world, such as the *Pedinidæ*, *Tentyriidæ*, *Anthrobidæ*, and *Halticidæ*. . . . . Some of the insects of the collection have labels attached, from which may be ascertained the particular island of the Galapagos Group from which they were procured, and where this was the case I have not found any species which is common to two or more of the islands."

On the 19th January, 1836, Mr. Darwin, then in New South Wales, was approaching Bathurst:—"I was interested by finding here the hollow conical pit-fall of the ant-lion, or some other insect: first a fly fell down the treacherous slope and immediately disappeared; then came a large but unwary ant, its struggles to escape being very violent; those curious little jets of sand, described by Kirby and Spence as being flirted by the insect's tail, were promptly directed against the expected victim. But the ant enjoyed a better fate than the fly, and escaped the fatal jaws which lay concealed at the base of the conical hollow. The Australian pit-fall was only about half the size of that made by the European ant-lion."

April 1st to 12th, 1836, was spent at the Keeling or Cocos

Islands, in the Indian Ocean, about 600 miles distant from the coast of Sumatra.

"Of insects I took pains to collect every kind. Exclusive of spiders, which were numerous, there were thirteen species, belonging to the following orders:—In the Coleoptera, a minute *Elater*; Orthoptera, a *Gryllus* and a *Blatta*; Hemiptera, one species; Homoptera, two; Neuroptera, a *Chrysopa*; Hymenoptera, two ants; Lepidoptera, a *Diopæa*, and a *Pterophorus* (?); Diptera, two species. A small ant swarmed by thousands under the loose dry blocks of coral, and was the only true insect which was abundant."

On the advantages to the naturalist of extended travel, the closing words of the 'Journal of Researches into the Natural History and Geology of the countries visited during the voyage of H. M. S. "Beagle" round the World' should be deeply impressed on the minds of all who may, if not now, yet in after-life, have opportunities of putting them in practice.

"In conclusion, it appears to me that nothing can be more improving to a young naturalist than a journey in distant countries. It both sharpens and partly allays that want and craving which, as Sir John Herschel remarks, a man experiences, although every corporeal sense be fully satisfied. The excitement from the novelty of objects and the chance of success stimulate him to increased activity. Moreover, as a number of isolated facts soon become uninteresting, the habit of comparison leads to generalisation. On the other hand, as the traveller stays but a short time in each place, his descriptions must generally consist of mere sketches, instead of detailed observations. Hence arises, as I have found to my cost, a constant tendency to fill up the wide gaps of knowledge by inaccurate and superficial hypotheses.

"But I have too deeply enjoyed the voyage not to recommend any naturalist, although he must not expect to be so fortunate in his companions as I have been, to take all chances, and to start on travels by land if possible, if otherwise on a long voyage. He may feel assured he will meet with no difficulties or dangers, excepting in rare cases, nearly so bad as he beforehand anticipates.

In a moral point of view the effect ought to be to teach him good-humoured patience, freedom from selfishness, the habit of acting for himself, aud of making the best of every occurrence; in short, he ought to partake of the characteristic qualities of most sailors. Travelling ought also to teach him distrust; but at the same time he will discover how many truly kind-hearted people there are with whom he never before had, or ever again will have, any further communication, who yet are ready to offer him the most disinterested assistance."

A few words in conclusion with reference to the tendency, now perhaps decaying but scarcely yet extinct among us, of describing species from insufficient materials. In turning over the pages of any of the older authors one cannot fail to notice that points which were much overlooked by them are these :—1st, the range of variation of a species in specimens from a single locality; and 2nd, the range of variation of a species in a series of widely separated localities.

To take the case of a travelled entomologist, who had never even left Europe, yet if he collected the same insect in twenty different localities from St. Petersburg to Lisbon he would thus learn more of its multitudinous phases than by any amount of cabinet-hunting.

In the course of my life I have described many species from single specimens, but I now look back upon such conduct as the follies of my younger days, for, if you have only a single specimen before you, your knowledge of its range of variation is literally *nil*; and who knows whether the solitary specimen you have before you is an extreme variation on the one side or on the other, or whether it represents the normal character of the species ?

Probably it would be a good plan to restrain our describing ardour—this *furor describendi*—till we have before us, at least, from twenty to thirty specimens of the species. We should thereby avoid many errors, and also much lessen the labours of posterity, who will often fail in the attempts to decipher our unsatisfactory descriptions. I can imagine that it may be urged that if A abstains from describing because he feels he lacks a sufficiency of material, B, who is not restrained by any such conscientiousness, will rush to the front and attain *priority*;

well, all I should say in such a case is this, if B likes to make a fool of himself, let him; A is not in any way injured thereby.

The nuisance of describing from unique specimens has been brought home to me very forcibly by my being asked over and over again by my continental correspondents to supply them with specimens of all the species I have ever described from single specimens; it seems uncourteous not to satisfy their expectations, yet at the same time the thing is physically impossible, as by far the greater number of these unique specimens, on which I founded species, still remain unique, and are not in my own collection.

Perhaps, if a species has not been regularly established within a period of say forty or fifty years from its first description, it would be a safe plan to look upon it as *non est*, and to omit it from our lists. Should it ever turn up in plenty it can always be resuscitated.

In vacating the chair, I must congratulate the Society that it has elected as my successor Mr. Dunning, one who has not been guilty of my youthful follies of founding a score of species on single specimens; the contributions that Mr. Dunning has from time to time made to the literature of Entomology have all been conceived in a truly philosophical spirit, and I trust we may yet see many more from his pen.

I have now only to thank the Society for the kindness with which my numerous shortcomings have been excused during the past two years.