CHAPTER I.

ON the 27th of December, 1831, a ten-gun brig, the "Beagle," sailed from Devonport. The object of the expedition was to survey certain parts of South America, and to put a girdle round the earth in the shape of chronometrical measurement. On the 2nd of October 1836, the "Beagle" made the coast of England once again. To the Englishman, with the old love of battle not quite dead within him, the "Victory" and the "Arethusa" are historical names among ships; but to the student far more highly ranks the name of the ten-gun brig "Beagle," for during that period of nearly five years the vessel was accompanied by Charles Darwin. "The Naturalist's Voyage Round the World" is an account in the form of a diary of the most interesting facts that came under the observation of the writer during that time.

Among the memories of our boyhood not the least vivid is the recollection of two quaint, long-haired men, who told us, in language of beautiful simplicity, two stories that never failed to fascinate. They are stories that will last as long as there are boys to read them. About their name hangs an indefinable charm, such as that which lies in the word "home," in the portrait of one long passed away, in the scent of a flower that one's mistress was wont to twine in her sunny hair. The names of these two writers are Daniel De Foe and John Bunyan. Next to "Robinson Crusoe" and "The Pilgrim's Progress," I know of no book so likely to take firm hold of a boy's mind as "The Naturalist's Voyage Round the World."

The outcry against fairy tales for boys and girls should be left to Mr. Gradgrind. The rest of the world must confess to a passionate admiration for "Jack the Giant-Killer," and a passionate adoration of "Cinderella," and is never tired of hearing of gnomes, and pixies, and kelpies. On the other hand the terrible outcry made by some good folks

against giving facts to children is a little incomprehensible. It seems to be forgotten that to our little ones all they read and hear is true. Hop-o'my-Thumb, Friday, Mr. Great-heart, are real beings to them. They *know* that the wonderful beanstalk grew to that portentous height. They *know* that Cassim's bones are still lying in the robbers' cave. They *know* that Aladdin's lamp is somewhere in the world, if they could but find it. Let the children have the beautiful old fairy tales, but let them have, moreover, such books as this whereof we speak. They will learn for themselves sufficiently soon what is romance.

And indeed "The Naturalist's Voyage Round the World" reads very much like a fairy tale. It takes us into wonderful regions, where vampire bats flit through the night, where man's path lies across beds of sensitive plants, and a broad track is left behind him marked by the drooping of the tender leaf-stalks, where peach-trees are used for firewood, where hail falls that kills cattle, where showers of butterflies come like summer rain. From the first page to the last the book is crowded with facts as dazzling as any inventions of the most brilliant fancy.

No special knowledge is required to enjoy this most fascinating work. Its statements will, of course, have a deeper meaning to anyone possessed of a little scientific lore; but some of the most enthusiastic admirers of the book are readers of the ordinary class, without the faintest suspicion of technical knowledge.

And yet Mr. Darwin's style can hardly be called a popular one. He is not an elegant writer. Some of his sentences, indeed, are at times almost clumsy, but the exquisite charm of the new series of facts he tells us atones for any peculiarities of style. We forget how he talks to us: we are so delighted with what he says. If he had written nothing else this volume alone would have stamped its author as one of the first among contributors to general scientific knowledge.

Pre-eminently in this work shine out Mr. Darwin's extraordinary powers of observation. He seems well-nigh omniscient. Nothing escapes him. Dust in the air, color in the sea, the habits of a spider, a cuttle-fish, an ostrich, an Indian, he notices all. But whilst this, his first great work, is specially a collection of facts, it is not that alone. Again

and again are encountered instances of his capacity for abstracting from a large number of small truths the one great truth running through them all. In these pages the reader of riper mind will linger over many passages that the boys and girls will skip—passages embodying wide generalisations, pregnant with interest. Especially will the student be impressed with the numerous occasions whereon he will meet hints and suggestions of the line of thought so fully worked out in later years in "The Origin of Species." In this first publication are the germs at least of the views enunciated in the "Magnum Opus."

It will be well to consider—A. The nature of the facts communicated to the world in "The Naturalist's Voyage:" B. The nature of the chief generalisations contained in the volume. It is especially difficult to separate fact from generalisation with Darwin, but the attempt will be made. C. The foreshadowings of later theories.

A. *An account of some of the most important facts contained in "The Naturalist's Voyage Round the World."*

(1.) On the 6th of December, 1834, on the island of San Pedro, off the coast of Chili, were to be seen two English naval officers engaged in taking a round of angles with a particular astronomical instrument known as the theodolite. Upon this island of San Pedro at that time resided a certain fox, who on the day and at the hour in question was indulging in his customary evening stroll. Beholding the strangers in the course of his peregrinations, the perambulating animal stopped, and took a cautious survey of them. His curiosity was aroused. He grew deeply interested in these men performing such strange antics with such a queer-looking instrument. He became absorbed in contemplation. On the rocks behind him, a naturalist, ever on the look-out for new specimens, happened to be walking. *He* became absorbed in contemplation of the rare animal before him. The animal was curious in two senses of the word. The interest of the scientific fox took the passive form of close observation. The interest of the scientific man took the active form of cautious advancing. The former stood wrapt in wonder. The latter drew near, and smote a deadly blow with a geologist's hammer on the head of the observing

one. The name of the fox, whose remains are to be seen to this day in the museum of the Zoological Society, was *Canis fulvipes*. The name of the naturalist was Charles Darwin.

The earth is one great battle-field. Between the innumerable races of animals dwelling on the bosom of that which is the mother of them all endless struggles occur. No mere skirmishes are these contests, as a rule, but battles, wherein death is the penalty of defeat. "Væ victis!" is the cry of all nature. No matter of surprise is it, therefore, that in "The Naturalist's Voyage Round the World" stories such as the above are not infrequent. No wonder is it that some of the most fascinating parts of the book are those wherein are recorded the life and death struggles of the animal creation. We read with deepest interest, whereunto something of horror lends a zest, of the weird, ghoul-like wasps that sting spiders or caterpillars, not to death but half way thereto, and then store up their victims till such time as the wasp larvæ, emerging from the eggs, devour at their leisure the inert yet living bodies of their prey. We watch eagerly the fight between wasp and spider, the wounding of the latter, its temporary escape, the wondrous, systematic hunt for it by its unrelenting foe, the discovery, and finally, after much artful manœuvring, the deadly stab that narcotises the unfortunate Arachnid. It is with a pleased sense of that poetic justice, so dear to us all when it is dealt out to other people, that we read, on the other hand, of the terrible spider which wraps round and round the miserable wasp entangled in its web, a fatal mesh, then, inflicting the death-bite, waits with a fearful patience till the poison has done its work, and the blood of the victim may be sucked from the lifeless corpse.

There are endless tales, moreover, for those who object to sup even lightly of horrors. The very spider mentioned immediately above, when disturbed, has all kinds of ways of saving itself from peril. Now it runs from one side of its huge web through a central passage to the other, now it drops into the dense thicket beneath, often letting fall a fine rope previously, down which it lowers itself with marvellous rapidity; now, standing in the middle of the web, it jerks the gossamer circles backwards and forwards with such speed that, in the rapid

vibration, the outline of the creature's body becomes indistinct and lost.

Amongst curious animals tortoises again rank high. Some met with in Chatham Island weighed respectively more than fourteen stone. These huge monsters, suggestive of antediluvian beings, when encountered usually fall to the ground as if dead, with a deep hiss, and a sudden and alarming disappearance of head and limbs. A few taps on their shells will reassure them, and rising they march sedately onwards, even with a man standing erect on their backs. Very sedate, in truth, are their movements. Some six yards per minute was all that could be accomplished by one of average speed, even when not suffering from the pressure of a superimposed naturalist. A very powerful attachment to water is characteristic of these Chelonia and near the springs are to be seen two sets of the reptiles, the one hastening with outstretched necks and longing aspirations towards their watery elysium, the other returning calm and composed, with all the complacent though somewhat irritating equanimity of satiety. In this way they tread out broad, well-beaten paths from the coast inland, paths which led to the first discovery of the watering-places by the Spaniards.

These beings live, apparently, to an exceedingly venerable age. Slow in living they seem to be equally so in dying, generally terminating their lives by a fall from a precipice or some other accident. In connexion with this same subject of death, a curious fact is recorded in relation to certain parasites on birds that reminds us forcibly of the half-mythological tales of rats deserting a ship doomed to destruction. For several hours before the death of a huge condor—one of the carrion fowl of America—the parasites upon it were seen crawling to the outside feathers.

(2.) Amongst the multitudinous epigrams that flowed from the facile pen of Alexander Pope, versifier, the one most frequently quoted is the epigram that tells us that "the proper study of mankind is man." It is as true as are most epigrams. With the swiftly attractive and noticeable germ of truth contained in the phrase is bound up so much of exception, and the condensed brilliancy of the witty saying has to be toned down by so much of the shadowing off that results from after-reflection, that the statement is a veritable epigram. The habit of condensing much thought into a

short phrase is worthy, but not unattended with danger. The complex relationships of our modern life are not easily summed up in one neatly turned remark, and during the condensation of an idea into a pithy sentence evaporation may occur, and something of accuracy be sacrificed to the desire for brilliancy. Despite all this, not the least interesting genus we can study is the genus *Homo*. For all mankind, metaphysics and history, the two sciences that treat of man himself, possess a fascination quite peculiar to themselves, a fascination whose like is scarcely to be found in any of the studies that investigate forms of matter other than that known as human.

An observer so acute as our greatest naturalist, during five years spent in foreign climes, could not fail to note many a fact of interest concerning the men he encountered. They were men not infrequently whose structure would force him to place them in the same order and genus with himself, but whose mental and moral natures were separated widely indeed from his own.

We could scarcely place in this latter category, however, General Rosas, despotic ruler, in fact if not in name, of the wild Gauchos of the Rio Colorada. This remarkable man seems to have been a kind of South American Cnut. He kept two fools, like a baron of the middle ages. His laugh was a dreaded sign of punishment impending, and his method of punishment was to stretch a man between four stakes, like a hide that is to be dried. He had been chosen General because he was able to sit on a cross-bar under which wild horses rushed at full speed, to drop thence on one of the animals, and without aid of saddle or bridle not only to ride the creature but to bring it back to the place whence it started.

Almost as interesting a study are the Fuegians. Three of these were in the "Beagle." They were returning to their native land, whence Captain Fitzroy had brought them four or five years previously. A most amusing boy was Jemmy Button, whom the Captain had purchased in his former voyage for the immense sum of one pearl button. A chubby lad was he, with a quite abnormal fondness for cleanliness and gloves, peculiarly acute sight, and a great belief in his own country, wherein he firmly maintained that necessary appendage of civilisation, the devil, was non-

existent. Notable was the difference between him and the Fuegians who had received none of these advantages. These were stunted, greasy wild beasts, with hideous features bedaubed with entangled hair, with harsh, grating voices, a repulsive habit of ape-like mimicry, and scarcely a suspicion of clothing. They had no belief in a future state, no rites that the wildest imagination could twist into religious ceremonies, and in times of scarcity would hold their old women over the fire-smoke, and then devour them, before they sacrificed their very dogs. Yet were these of the same race as this decent, well-dressed, well-behaved, and as things go now, tolerably moral youth. He was simply one of these horrible savages *plus* education.

The incessant cry of these beings was, "Yammerschooner!" which being interpreted means, "Give me!" Everything down to the very coat-buttons, with the one significant exception of the guns, did they point to with the cry, "Yammerschooner!" With young and old, women and men, it was the same, the last, if they failed on their own account, pointing first to the object of their desire, then to their wives or children, with the like eternal cry. It has been suggested that something very like "Yammerschoonering" is to be seen in more civilised realms than Tierra del Fuego.

As one reads the account of these low forms of man, and of others their allies, it is possible to see how one question is already moving in the mind of their observer. Reading between the lines it is not difficult to observe this inquiry suggesting itself: Are these creatures created in the likeness of a perfect being, or are they evolved from those animals that I see around them, and that I behold living lives almost as lofty as theirs? To that question, even thus early I say, moving within the mind of the young writer, he was destined in the after-years to give no uncertain reply.

(3.) But of course the most interesting man in "The Naturalist's Voyage Round the World" is its writer. In novels and plays we always want the author's personality to be merged into that of his characters In a diary we look for that personality to be vivid, distinct. At first one is inclined to say that the journal is disappointing in this respect. It seems to be full of a thousand facts, a hundred specu-

lations, but to contain too little of Dr. Darwin himself. A little reflection dispels this idea. We recognise that these facts, these speculations, *are* Dr. Darwin, that the observation of things, the construction of hypotheses, are part and parcel of his very nature.

We obtain some glimpses also into the inner life of this remarkable man. We see in him a grim sense of humor, a love for all his kind—above all that charming modesty and freedom from aggressive and dogmatic assertion which have ever distinguished his works.

In these days, moreover, when the sweeping condemnation of such gifts as nature provides for moderate consumption is too rife—in these times when people are to be found who have so low an opinion of human nature as to imagine there can be no temperance without abstinence, I confess to a feeling of pleasure in speaking that a man of such extraordinary attainments as Dr. Darwin openly expresses his delight in a good dinner and a good cigar. In these days, also, when clergymen at Church Congresses can advise hearers to abjure entirely all kinds of light reading, every species of public amusement, it is right pleasant to find one who has done more work and better work than any man of his time speaking of a theatre not as a hotbed of vice, but as a place of rational entertainment. It is well for us to recognise (and to insist on others recognising) that amusement is as essential to man as work. It is time that such puerilities as the absolute condemnation of all amusements should be treated with the scorn that we should lavish on one who, passing to the opposite extreme, stated that life should consist solely of entertainment, to the exclusion of all honest labor. It is those who do not know the meaning of real, warm, hearty world-work that speak thus. The thorough men and women do not echo such cry, and open their clear honest eyes widely in wonder when it makes its moan. The true workers are the true players. He that is most man in his hours of labor is most child in his moments of sweet doing nothing. The heart that aches for humanity is, in order that it may work the better for its mistress, the most lightsome at times. The eyes that are for the most part stern in resolve, or pity-laden, are most full of the brightest mirth when the time for mirth is, and the voice that can exhort, warn, comfort, threaten, has the fresh, hearty ring

of the laughter of childhood when it sounds cool and clear over the waters of the seaward-flowing river in the summer-time.

CHAPTER II.

B. *Chief Generalisations.*

CHARLES DARWIN has the power of observing facts. So numerous and acute are his observations that nobody can deny him the possession of that part of genius which consists in the immense faculty of taking pains. But he has that higher attribute of genius which enables the few to look into the very heart of multitudinous facts, and see the great truth that underlies them all. He is able to make generalisations. Even as early in his career as when "The Naturalist's Voyage Round the World" was written, we find Charles Darwin interspersing with his record of facts suggestions and hypotheses. These hypotheses have, almost without exception, passed long ere the present day from the region of hypotheses into that of general truths.

(1.) As early as the eighth page of the journal occurs a passage wherein is recorded the fact "that all the many small islands, lying far from any continent, in the Pacific, Indian, and Atlantic Oceans, with the exception of the Seychelles and one other little point of rock, are composed either of coral or erupted matter." This is at once connected with the statement that the majority of active volcanoes are either on islands or hard by sea-coasts.

(2.) Visiting the Galapagos Archipelago, a group of islands between five and six hundred miles to the west of America, the naturalist is struck with the remarkable fact that the different islands are to a considerable extent inhabited by a different set of beings. The islands are not more than fifty miles apart, have the same geological formation and similar climates, yet they are tenanted by different varieties of the same species of animals, so that the Vice-Governor could at once tell from which island a particular tortoise was brought.

(3.) When Columbus landed in America after the im-

mortal voyage, no horses were known in the country. From the observations of the "Beagle" naturalist, aided by those of others since the year 1833, has resulted the establishment of the hugely important fact that in South America, centuries agone, an aboriginal horse existed—that in the process of time, in the great battle of life, it was slowly forced out of existence, to be succeeded in the after years by its fellows, descended from those introduced by the Spaniards.

(4.) Siberia and Patagonia are regions not apparently presenting much in common. In the volume under discussion a striking resemblance between the two, at least as far as their remarkable salt lakes are concerned, is established. Both countries appear to have been recently raised above the level of the sea. Both present plains with shallow depressions filled with salt water. In both the muddy borders of these depressions are black and fœtid. In both, besides common salt (sodium chloride), Epsom salts (magnesium sulphate) and gypsum (calcium sulphate) are found in connexion with the salt lakes. Finally the salt lakes of both countries are the habitat of multitudes of small Crustacea and the haunts of the flamingo.

(5.) Dealing with the past history of the wonder-laden continent, our author broaches the probability of stranded icebergs grooving and smoothing rocks over which they passed, after the fashion of glaciers. This suggestion is worked out more fully in the ninth volume of the *Geographical Journal*. It is pleasant to record that this original idea of Charles Darwin's is now accepted as true by geologists.

(6.) The general assumption that the large animals of past times must have required, for their food, plants of corresponding size, that the mastodons, megatheriums, and deinotheriums must have browsed upon vegetation colossal in its dimensions, had been handed down from text-book to text-book. It was reserved for the author of "The Naturalist's Voyage round the World" to establish a generalisation the precise converse of the above. A mental glance, on one side, at South America, with, as its largest quadrupeds, tapirs, deer, and capybaras, and with its world of forests stretching hundreds of miles in all their wealth of wood and foliage and flower and fruit—a glance, again, to Africa, with its elephant, giraffe, rhinoceros, elan, and hippopotamus, and its infinite stretches of desert country, will help in the

comprehension, and, indeed force upon us a conviction as to the truth of Charles Darwin's hypothesis that the gigantic mammals of present and of past times have fed upon a vegetation that has been sparse rather than luxuriant.

(7.) Perhaps one of the most daring of hypotheses is that as to the formation of great mountain chains, such as the Cordilleras. Combating the view that these Titanic wrinkles on the breast of Mother Earth are the result of one single upheaval, he suggests that they are the consequence of repeated ejections of volcanic matter from the interior of the earth. These masses of fluid rock cast out of the earth's interior have been successively injected into a kind of hollow mould of the mountain chain, formed primarily by an upheaval of the land surface. These ejections from the earth, and injections into the hollow raised mould, must have occurred at sufficiently long intervals to allow of the cooling and solidifying of each layer before the next one beneath was upcast. In short, he holds that the upheaval of a mountain chain is not the result of one single enormous action, but of a series of such actions. The wrinkles on Mother Earth's bosom are not due to one struggle, but to the continued action of the hard taskmistress Time.

(8.) Perhaps the best-known and most extensively applied of the large truths enunciated in the first work of Darwin is his well-known theory of the subsidence of the base of the Pacific Ocean. Indeed, this, even in the year 1835, was not a theory. Thus, at pages 172, 321, 344, 369, 370, and 475, actual proofs of the subsidence are given. Our naturalist shows that the majority of oceanic living beings flourished, to use the phrase of the old historians, in comparatively shallow water. In comparatively shallow water, if the bottom remain stationary, no sedimentary deposit of any depth and extent is conceivable. Such a sedimentary deposit, of notable thickness and extent, is necessary for the preservation of organic forms as fossils. Yet, in connexion with the Pacific Ocean are found fossiliferous deposits of enormous extent and of great thickness, wherein are treasured the durable remains of organic beings, such as shells, that were, according to all evidence, inhabitants of comparatively shallow water. As the inferior layers, at least, of these mighty deposits are at great depths, the only hypothesis that binds together these many facts is that as the sedimentary

deposits took place the bed of the ocean slowly sank. Each layer, therefore, is formed in no great depth of water, stores up the shells of its time, and then slowly sinks, ever deeper, deeper, deeper, as future strata form upon it. This hypothesis is the hypothesis of Charles Darwin.

(9.) Lastly, the application of this same theory of subsidence to the explanation of the arrangement of coral reefs will be investigated in a special chapter, as the author has written on the subject a special book.

CHAPTER III.

C. *The Foreshadowing of Later Theories.*

IT is on record that that most didactic of English versifiers, William Wordsworth, gave utterance to the remark "the child was father to the man." As it is interesting to notice in the child the looks, the gestures, the habits that are destined to become part of the stock in life of the man, so is it interesting to notice how, in the earlier works of certain authors, there are faint adumbrations of ideas that are to be worked out more fully in their later writings. Such a study is of especial value in the case of Darwin. All the world knows that his fame is principally founded on the hypothesis as to the origin of the different species of plants and animals. In his first work, "The Naturalist's Voyage round the World," passages frequently occur, hinting at, faintly shadowing forth, the views enunciated in the "Origin of Species," supported by numberless facts in "Animals and Plants under Domestication," and elaborated in the "Descent of Man" and the "Expression of the Emotions." To call attention to some at least of the passages in his first work, where such foreshadowings occur, is the object of the present chapter.

(1.) At pp. 131, 132 a series of facts are given to show that North and South America, within a comparatively recently geological period, were much more closely related in the character of the animals inhabiting them than they are at the present day. There is no suggestion yet of the evolution of these animals from certain common primordial forms under the varying external conditions to which those primordial forms have been subjected in the two parts of the continent.

(2.) P. 315. The qualities of the mule as compared with those of its parents are noticed. Its superiority to both parents in reason, in memory, in muscular endurance, in

affection, and, to the consolation of some of us let it be added, in obstinacy, is suggested as instancing a case where art has outdone nature. This reflection, to those who remember how the account of artificial selection precedes the introduction of the theory of natural selection in the crowning work, will not be devoid of interest.

(3.) Upon pp. 379 and 380 of "The Naturalist's Voyage Round the World" a dissertation is introduced upon the beaks of a particular genus of birds. The careful investigation of so apparently small a matter as the beaks of one special genus of the class Aves, and a somewhat elaborate account of the results of such investigation, might seem work of supererogation at first sight. But he that studies the writings of our foremost Naturalist and the literature of Evolution generally, will learn that it is by the patient study of minute details of such kind as this, by the accumulation of numberless small facts, that the large ideas of Evolution have been suggested and supported. In the pages of the work at present under consideration certain pictures are given of the heads of certain birds. Three of the birds belong to the genus *Geospiza*. A fourth that is also represented is a member of another genus, *Certhidia*. The first species of the genus *Geospiza* (γη, the earth, σπιζω I chirp) is one known as *magnirostris*, or great billed. The third species whose head is represented is *Geospiza parvula* (*parvulus* = little). Its beak is small and of shape differing from that of its large-billed congener. Between these two forms of beak there are six gradations insensibly passing into each other. Only one of these six is shown in the book, the beak of *Geospiza fortis* (*fortis* = strong). This ranks as nearly as possible midway between the two extreme forms encountered within the limits of this single genus of birds. When comparison is made of these eight beaks and that of one of the birds belonging to the closely allied genus Certhidia is placed along with them, a regular gradation is to be noticed in the organs under consideration from a beak as large as that of a hawfinch to one about the size of the bill of a chaffinch. One passage referring to this subject is so remarkable viewed in the light of later writings from the same pen, that not without advantage it may be quoted here in its entirety. "Seeing this gradation and diversity of structure in one small intimately-related group of birds,

one might really fancy that from an original paucity of birds in this archipelago, one species had been taken and modified for different ends."

(4.) On p. 82 occurs a discussion on the Toxodon, a huge land animal, whose remains are found in company with those of the Megatherium, the Megalonyx, the Mylodon, and other giant mammals of the past, immersed in the plains of mud and sand encountered upon certain parts of the Eastern coast of South America. Our naturalist takes cognizance of the size of the Toxodon like any ordinary observer, but his acute scientific vision sees that which is invisible to the eye of the many. He is impressed with the blending in this one animal of bygone ages of the characters, not of distinct species, not of distinct genera, but of distinct orders of animals now extinct. In size the Toxodon reminds us of the Proboscidea or elephant order; in its dental structure, of the Rodentia or rat order; in many details of anatomical arrangement, of the Ungulata or hoofed order; in the position of its sense organs, of the Sirenia, the order including the herbivorous aquatic mammals. The sentence following the enunciation of these facts is interesting from an ethical point of view. It commences with the phrase "How wonderfully" and ends with a note of astonishment. Sentences akin to this are frequently encountered in the pages of Dr. Darwin's earlier works. They are not often seen in the productions of his later years. It savors of truism to say that the writings of younger men are more full of strong adjectives and adverbs, that their pages are more plentifully besprinkled with interjectional marks and remarks than are those of their elders. The first line in Shelley's first poem, the much abused and unequal *Queen Mab*, is "How wonderful is Death!" As years advance, in writing, as in all things, the hyper-enthusiasm of youth yields to the calmer judgment of maturer years.

(5.) In this, his first work, the word "created" occurs in connexions wherein it would certainly not be encountered in the present writings of our author. It is true that it is not accompanied by the word "specially," nor does he, to the knowledge of the present writer, use the phrase "special creation;" but two passages at least that will now be quoted show that in the year 1835 he still employed the phraseology that his own labors have since done so much to

render antiquated. P. 289, "finding, as in this case, animals which seemed to play so insignificant a part in the great scheme of nature, one is apt to wonder why they were created." P. 391, "at the Galapagos Archipelago we have a halting place, where many new forms have been created."

(6.) As we read the young Naturalist's description of different animals, it is evident that the possibility of the evolution of higher forms from lower is growing upon him. Even in dealing with the highest of all animals, the genus Homo, it is clear that this possibility is very present with him. The grades of human-kind seen in his travels ranged over a very wide intellectual area. Indeed, some of the races he portrays hardly admit of the employment of the adjective "intellectual" in connexion with them. It is in the account of these lowest specimens of humanity that the most striking phrases occur to assure us that his mind is even then pondering on the question, whether, from a form of being that was the parent of these stunted wretches, by courtesy called men, could be evolved in the course of time peoples that should number among them a Shakspere and a Goethe. One reference in support of the above passage may be made to the description on pp. 205 and 206 of the savages who were so far in advance of many of their fellows encountered by him at Tierra del Fuego.

(7.) In the "Origin of Species" occurs very frequently the word "reversion." Reversion signifies the abnormal appearance in an animal, or a plant, of some peculiarity that was possessed by one of its ancestors, but is not possessed by its fellows. The word presupposes that the species of plants and animals at present in existence have originated from a few primordial forms, and are not the work of special creation. Gardeners frequently meet with plants differing in some detail from their fellows. They call them "sports." Similar sports occur in the animal kingdom. Many of these sports are explained by Charles Darwin as cases of temporary reversion to a condition that was permanent in the ancestral type. To take a time-honored illustration, horses are occasionally born with stripe marks upon them. It is hardly necessary to call to the reader's mind the zebra, in order to point the moral of this occurrence.

In "The Naturalist's Voyage Round the World" the

theory of reversion is not actually enunciated any more than the theory of natural selection. But reference thereto is made. Thus, on p. 505, mention is made of the fascination that hunting exercises over almost all mankind, and not a few of womankind, and the delight that is felt in living in the open air, when one does it from choice and not from necessity. The love of the chase is a relic of the old conditions of existence when the chase was essential. It carries us back to the early times when savage man, skin-clad and armed with spear and bow, in primeval forests slew for very livelihood the beasts that were almost his fellows. The love of travel and the delight that the strong man feels in sleeping with the earth for bed and star-crowded sky for canopy carry us back to nomadic ages when houses and cities were not. So that the modern picnic, with its paraphernalia of champagne cup, lobster salad, indifferent amateur waiters and cooks, flirtations, and colds in the head, is but a case of the reversion of society to the habits of its dead-and-gone ancestors.

(8.) One passage in the book under consideration suggests the general principle upon which so many anatomical and physiological variations that occur first 'accidentally,' have become permanently fixed in the races of beings presenting them. Such a principle is, of course, of enormous importancce in the study of evolution, or the development of many species from a few primordial forms. The passage referred to deals with the development of the habit of man-fearing in wild birds. Thus the birds at Bourbon in 1571 were perfectly tame; at the present day they are wild enough. After noting this fact follows the passage in question. The wildness of birds with regard to man is a particular habit directed against *him*, and not dependent on any general degree of caution arising from other sources of danger; secondly, it is not acquired by individual birds in a short time, even when much persecuted, but in the course of successive generations it becomes hereditary.

(9.) Hints occur in the pages of this first production of a principle much enlarged upon in later works. This is the principle of the struggle for existence. On p. 175 we read: "Some check is constantly preventing the too rapid increase of every organised being left in a state of nature." And again: "Causes generally quite inappreciable by us determine whether a given species shall be abundant or

scanty in numbers." This idea, like most of those broached in "The Naturalist's Voyage Round the World," is discussed more fully in the succeeding volumes.

(10.) Finally, I purpose referring to four or five passages in which the attentive reader can trace a still further foreshadowing of what is to come. They are passages that contain hints of the line of thought along which our greatest naturalist has worked during the last forty years. On p. 378 is the phrase, "That mystery of mysteries, the first appearance of new beings on this earth." To the elucidation of that mystery none has contributed so largely as the writer of that phrase. On p. 176 we read: "If, then, as appears probable, species first became rare and then extinct; if the too rapid increase of every species, even the most favored, is steadily checked, as we must admit, though how and when it is hard to say, and another closely allied species is in the same district, why should we feel such great astonishment at the variety being carried a step further to extinction?" This is from the pen of the author of "The Origin of Species." P. 173: "This wonderful relationship in the same continent between the dead and the living will, I do not doubt, hereafter throw more light on the appearance of organic beings on our earth and their disappearance from it than any other class of facts." Here is reference to the value of the study of fossils in any inquiry into the origin of living beings. But the most interesting part of the quotation is the intrinsic evidence it affords that this inquiry will be prosecuted by the writer in after time. A passage previously quoted on account of the word "created" therein, is worth requoting in this connexion with its context. P. 289: "When finding animals which seem to play so insignificant a part in the great scheme of Nature, one is apt to wonder why they were created. But it should always be recollected that, in some other country, perhaps, they are essential members of society, or at some former period may have been so." Lastly, on p. 192, is one of the most characteristic passages in the book, involving a distinct suggestion of the survival of the particular variation in a contest with other kindred variations. It is not precisely an enunciation of the survival of the fittest, but certainly contains the germ of the theory of natural selection: "It is interesting thus to find the once domesticated cattle breaking into three

colors, of which some one color would in all probability ultimately prevail over the others, if the herds were left undisturbed for the next several centuries."