

mire. The responsibility, therefore, rests with the Government, who must do for the people what they cannot, and perhaps, have not altogether the power to do so well for themselves. Happily, Belgium is favoured with a Government to whose hands this great movement may be confided with safety, and who will not fail to direct it with firmness and prudence. The sooner it is begun the better for Belgium, and the rest of the countries trading with China. France and England have already, we believe, signified their cordial sympathy in the undertaking; so that its progress will be accelerated by the moral support of the Powers who wield the greatest amount of influence in the East.

ART. V.—*The Origin of Species by Means of Natural Selection; or the Preservation of Favoured Races in the Struggle for Life.* By CHARLES DARWIN, M.A., Fellow of the Royal, Geological, Linnean, &c., Societies. London: John Murray. 1860.

WHEN a person has studied a particular subject for upwards of twenty years it must be admitted that this long apprenticeship entitles him to a respectful hearing. Such a person is Mr. Darwin. When a philosopher takes a difficult question in hand, and patiently collects a mass of facts, which he scrupulously digests before he permits himself to hazard a conclusion, we feel that however much his inferences may clash with accredited doctrines, they cannot be cavalierly discarded as if he were a speculator who run up theories as glibly as the Abbé Sièyes ran up constitutions. Such a philosopher is Mr. Darwin. He is not the man to mount a hobby and ride it pompously into the arena of science, smiling complacently as if fascinated with its paces, and fully convinced that it was a match for any Bucephalus that ever breathed. But calm and judicious—though his fine hypothesis respecting the coral formations shows that he can be bold and enterprising—he understands well how to keep a close rein upon fancy, and rarely ventures abroad without a full budget of facts to support him.

And what is the subject over which this eminent naturalist has been poring for more than twenty years?

Simply to say that his purpose is to ascertain whether species are mutable or immutable, whether they have a fixed or only a

fancied existence in nature, would imperfectly express the scope of his inquiry. To present the question in this shape would probably induce some of our readers to dismiss it at once, thinking that it was a fit theme only for persons who, like the ancient dialecticians, would spend whole days in arguing whether the ideal exemplar of horses had an actual being independently of the horses themselves. But purely with a view to interest those who might be disposed to leave the subject to the Dryasdusts of science (wishing them well out of the discussion), let us first exhibit it under one of its most startling aspects.

There have been many persons who believed that one kind of creature might in process of time be transformed into another kind of creature, just as there have been people who believed that a lump of lead might be transmuted into a lump of gold.

You visit the monkeys in some great zoological collection. If yonder orang-otang or chimpanzee could speak as animals used to do in the days of the fabulists (and very sensibly too in general), what sort of an harangue would it deliver? ‘Gentlemen of the human species,’ it might say, ‘you may laugh at us as much you choose. *Quid vetat?* It is very true that we are clumsy, inelegant brutes. I admit it. Our arms are undoubtedly very long and ungainly. The toes of our feet are turned inwards, and in consequence we are compelled to waddle along in a rather facetious way. Our thick lips, wrinkled cheeks, and protruding snouts, do not exactly constitute the most prepossessing features in the world. I grant, too, that our facial angle—so your Mr. Camper called it when he measured us with his callipers as he pretended to do everything from a mouse to a Bourbon—is shockingly small. In fact, I am free to confess that my cousin, the baboon yonder, is as hideous a fellow as ever lived. And our habits, you say, are low and grovelling? By no means improbable! We don’t pretend to be fit creatures to sit down at fine tables or lounge in gilded drawing-rooms. But what of all this? Just a word in your ear, gentlemen. Are you aware that you and we have come from the same stock—that we are all descended from one common ancestor—that we, vile despicable brutes as you deem us, are in truth bone of your bone, and flesh of your flesh? Yes, my dainty young lady (you with the gay parasol and copious crinoline), pray don’t look so indignant when I venture to suggest that there would be nothing particularly outrageous (that’s my candid opinion) in your selecting a husband from this very menagerie. I am willing to make you an offer myself. It is true we are only ‘poor relations,’ as one of your would-be wits has styled us; but the simple difference between us is, that you have got on

‘faster in the world than ourselves, and consequently hold your heads a little higher than you ought. Consult the writings of Monsieur Lamarck on the subject. He is my authority. You can’t surely object to the testimony of one of your own conceited species. I would recommend you, therefore, to be a little more civil. Let us be on friendlier terms for the future. Remember that if we are not exactly men, we are next door to humanity; if not brothers, we can yet boast the same lineage, and are entitled to wear the same coat-of-arms as yourselves. Such as I am now, such was once the very, very great-grandfather of your race, and, therefore, when you next ‘stir us up,’ be pleased to do it with a little more tenderness; and if not with fraternal leniency, yet with some recollection of the respect which is due to the common progenitor of men and monkeys.’

Now we do not wish the reader to assume that Mr. Darwin puts this specific case of transmutation. Many persons will certainly consider that it is contained in—we ought rather to say covered by—his general conclusions. For he not only holds that one species may gradually produce another species, but he extends this doctrine ‘to all members of the same *class*’;—

‘I believe that animals have descended from at most only four or five progenitors, and plants from an equal or lesser number. . . . Analogy would lead me one step further, namely, to the belief that all animals and plants have descended from some one prototype. But analogy may be a deceitful guide. Nevertheless all living things have much in common, in their chemical composition, their germinal vesicles, their cellular structure, and their laws of growth and reproduction. We see this even in so trifling a circumstance as that the same poison often similarly affects plants and animals; or that the poison secreted by the gall-fly produces monstrous growths on the wild rose or oak-tree. Therefore, I should infer from analogy that probably all the organic beings which have ever lived on this earth have descended from some one primordial form into which life was first breathed by the Creator.’ (p. 484.)

Still less do we wish to tinge Mr. Darwin’s speculations with a dash of the ludicrous, by ranking him amongst the ordinary animal alchemists. We laugh at Rousseau when he intimates that primeval man went on all-fours. We attach no importance to the opinion of Lord Mouboddo, when he declares that ‘the orang-otang is proved to be of our species by marks of identity which he thinks are incontrovertible.’ We lose our gravity completely when good Mr. White hands us a treatise entitled *An Account of the regular Gradations in Man and different Animals and Vegetables, and from the Former to the Latter*. Nor will the views expressed in the *Vestiges of Creation* commend the

doctrine of organic metamorphosis to those who know how heartily that production has been abused. Even the learning of professed naturalists like Lamarck (the friend of our chimpanzee) and Geoffroy St. Hilaire has been totally insufficient to preserve their theories from ridicule; for who could believe that the mere appetencies of a creature would enable it to develop wings if it wanted to fly, or fins if it took to the water and determined to become a fish? Or who could place much faith in their conclusions when, with the appalling fatuity which characterizes all infidel philosophy, it was asserted that Nature could produce nothing more than a mere undigested germ or monad, and yet that this germ or monad could by virtue of its intrinsic powers pass through every stage of animal life until the zoophyte culminated in man?

The great question, then, which is raised by Mr. Darwin's book is—How did species originate? Did each spring from one independent pair of ancestors, requiring therefore a distinct creative fiat, and consequently involving as many separate exertions of Divine power as there are, or have been, specific groups on the face of the globe? Must each of such groups transmit its properties to its descendants without substantial alteration, or may it in process of time and by the gradual influence of causes, either natural or artificial, throw off animals of a different character, which, like the colonies of a great empire, shall ultimately take rank as separate empires themselves?

Now the prevalent opinion of philosophers is undoubtedly that species have a real existence in Nature; that their boundaries, whatever these may be, are virtually impassable; and that though individuals belonging to different groups may breed together for the nonce, yet that their progeny is incapable of handing down its peculiarities through a long line of successors, so as to establish itself permanently on the earth. What is there to suggest a contrary conclusion?

In the first place it is universally acknowledged, that various physical modifications may be produced in plants and animals by artificial means. Wild vegetables as well as wild quadrupeds may be tamed, and new properties elicited or old ones suppressed. *Brassica oleracea* furnishes a remarkable illustration. No one would think of ordering a dish of the harsh saline plant which grows on the sea-shore under this sounding title, but which is as unfit for culinary purposes as nettles or kelp. Let the vegetable, however, be civilized by the gardener's care, and it yields a number of highly esteemed esculents. Under the less learned designations of cabbage, cauliflower, or brocoli, *Brassica oleracea* may be brought to the table with credit, and even

worked up into a great national institution in the shape of the 'kale brose of auld Scotland,' or the sauer-kraut of Germany. The wild crab is an excessively austere and unamiable sort of tree; for it bristles with thorns, and produces a small fruit of extremely acrid taste, but when subjected to kind treatment in the orchard, it casts its prickles, undergoes countless modifications, and furnishes us with savoury ribstone pippins, or Cornish gilliflowers, which may be eaten without costing us a single wry face. Equally striking are the changes that may be developed in animals where they admit of domestication. What a difference between the lordly mastiff, full of fire and pugnacity, and the silken puling poodle, ready to expire of laziness and repletion! How unlike each other in many respects are the stiff-set bull-dog and the slender-limbed greyhound! Amongst horses what a marked distinction exists between the high-mettled racer, which paws the ground like Pegasus when preparing for a trip, and the dull brute which drags the plough or the cart, without venturing to indulge in a kick or a caper. The ox, the sheep, the hog, our poultry, and other 'tame villatic fowl,' admit of various degrees of diversification. Of the domestic pigeon, for example, the breeds differ to a remarkable extent from the original, the rock dove (*Columba livia*). The fan-tail has about three times the normal number of feathers in its tail, and these it erects in a very pompous fashion, so as to touch its head whenever it chooses. The carrier exhibits a wonderful enlargement of the carunculated skin about the scone, whilst the pouter has a capacious crop which it can inflate to such a degree that the creature looks excessively absurd. The short-faced tumbler has a still more ridiculous property; for in its flights through the air it performs a series of somersaults, twirling head over heels, like a mendicant acrobat in the streets. Owing to the extraordinary method of cooing adopted by one breed, the members have been styled trumpeters, and the vocal eccentricities of another race have earned for them the title of laughing pigeons.

Now how are these varieties produced, or rather how are they established? Not *per saltum*. We cannot leap at once from a wild cabbage to a polished cauliflower. Nor will the immediate offspring of a rock-dove be likely to distinguish itself in its aerial gymnastics, however much it may wish to practise as a tumbler. Suppose, however, that some slight peculiarity either of form, size, colour, instinct, or otherwise, should appear in an animal, then, inasmuch as there is a tendency to transmit the properties of the parents to the children, it is possible that this recently developed feature may be conveyed to its issue; and if by carefully maintaining the conditions of food, climate, and other data

upon which the novelty depends, and still more by a judicious pairing of such animals as seem best calculated to cherish and perpetuate it, man thus fastens upon any given property, why should he not be able to instal new varieties to an indefinite extent upon the earth? Can we not in fact add up certain small and successive deviations from the primitive model, until the sum total becomes noticeably great? Professional breeders of cattle, indeed, sometimes speak of a creature as if its organization were perfectly plastic in their hands. You would fancy that its form might be altered almost as easily as if it were a thing made of putty or of clay. Mr. Youatt, speaking somewhat figuratively, says that the doctrine of selection 'enables the agriculturist not only to modify the character of his flock, but to change it altogether. It is the magician's wand by means of which he may summon into life whatever form and mould he pleases.' According to Lord Somerville, it would seem as if breeders had 'chalked out on a wall the most perfect form of a sheep, and then given it existence.' Sir John Sebright used to assert with respect to pigeons, that 'he could produce any given feather in three years, but it would take him six years to obtain head and beak.' 'In Saxony,' says Mr. Darwin, 'the importance of selection in regard to merino sheep is so fully recognised, that men follow it as a trade, the sheep are placed on a table, and are studied like a picture by a connoisseur; this is done three times at intervals of months, and the sheep are each time marked and classed, so that the very best may ultimately be selected for breeding.'

This power of modification is not simply morphological, but in certain cases extends to the instinct and habits of the animals as well. Mountain travellers are generally surprised, and sometimes extremely annoyed, by the apparent perverseness with which their horses turn the sharp corners of the passes, and keep close to the brink of a precipice. When timorous ladies venture up the Ghemmi, they naturally conclude that their quadrupeds are bent upon committing suicide at every angle of the dizzy path; for the brutes make a considerable sweep at each zigzag, and give the rock as wide a berth as they can. Why is this? The guides will tell you that the progenitors of the animals, having been accustomed to carry burdens, found it necessary to keep at some little distance from the face of the cliffs, lest their loads should come in contact with the escarpment, and so tumble them into the abyss. And this instinct, say they, has been transmitted to the descendants, for the young horses exhibit the same propensity and frighten their riders as effectually as the more experienced practitioners of their race. In some portions of South America steeds were tamed to a peculiar amble, which at length became

hereditary ; so that a juvenile colt voluntarily adopted this mode of progression, without the slightest persuasion from the whip or the spur. It is well known that the faculty of 'pointing' or 'retrieving' in dogs has been handed down from sire to son. Sir Charles Lyell quotes some interesting illustrations of these patrimonial habitudes. In the district of Santa Fé, in Mexico, there are hounds which always charge the deer when the weight of the body is thrown upon the forelegs. A dog of another breed would deliver the assault at the first practicable moment, and being comparatively light, would not only fail to overturn its intended victim, but might itself fall crushed or dislocated by the shock. Just so in hunting the pécari on the banks of the Magdalena, there are animals which sagaciously drive the herd before them instead of plunging in amongst the flying brutes, whereas a young dog of another race, and of undisciplined valour, would adopt this latter course, and be killed before he could effect a retreat.

But if man can thus produce new varieties—can modify plants and animals by artificial appliances—why should not Nature accomplish the same results on a much grander and more extensive scale? That she does so, even to the elaboration of new species, cannot be doubted for a moment, according to Mr. Darwin.

To explain the process, this able philosopher introduces his great principle of Natural Selection.

Let it be observed that a sort of battle, if battle it can be called, is constantly raging throughout the various departments of organic life. From a weed to an elephant, everything has to wrestle with adverse influences, by which its character may be affected, or its very existence destroyed. Not a single object, it may be said, can have its full and uninterrupted 'swing' upon our globe. This is obvious, from the fact, that each vegetable, each animal, is capable of producing an unlimited number of descendants, if circumstances would permit. A few nettles would soon overrun an empty world, were they allowed to breed without resistance from the climate or the soil. A few codfish would soon stock an unoccupied ocean, were it a question of simple fecundity on their part. Varying as creatures may do in point of fertility, the power of expansion is so enormous that unless some stern limitations were imposed, all living things would crowd up against each other with such ferocity, that it would kill an economist, like Mr. Malthus, to speculate upon the results. The elephant is the slowest of all hands at gestation: its period is upwards of twenty months: it gives the registrar of births no work to do until it attains the age of about thirty; and although it may continue its contributions to the census until it reaches ninety or one hundred, it will rarely bring up as large a family as

you see in almost every human labourer or mechanic's cot. Yet, according to Mr. Darwin's calculation, if we reckon its progeny at half-a-dozen alone, a single couple of these 'half-reasoning' brutes would throw off not less than fifteen millions of descendants in the course of five centuries! And if this be the case with sluggish breeders, like the elephant, imagine the disgust which poor Malthus would feel when he learnt what feats could be performed by creatures of a far more objectionable description. Latreille informs us that during the months of summer a solitary female plant-louse will produce a litter of about twenty-five young *per diem*—that is rather more than one for every hour; whilst Reaumur computes that in the course of five generations (all issued within a quarter of a year), this horribly prolific animal will become the ancestor of not less than 5,904,900,000 insects as disagreeable as itself. The extraordinary development of locusts is well known. These voracious creatures have suddenly invaded countries like armies of evil spirits, and after peeling off the vegetation, their bodies have strewn the ground in many places to the depth of more than a yard, producing pestilences by which thousands of human beings have been swept from the earth. In fact, if Noah, when pondering over the fate of the creatures which emerged from the ark, had duly considered their indefinite powers of increase, he would probably have concluded that in the course of a few centuries the world must be converted into a scene of awful carnage and confusion. In the vegetable kingdom, too, we discover a similar propensity to expand. Take an annual plant which yields two seeds only during each season, and it follows from the laws of geometrical progression, as Linnæus remarks, that its progeny will amount to a million in the course of twenty years. But since no annual plant contents itself with mere twin births, but indulges in much larger feats of parturition, it is obvious that a vegetable which would have found ample space in a flower-pot some ten or twenty centuries ago, would now require a whole continent, had its issue been allowed to multiply unchecked. What prevents?

There are many elements of opposition. Some animals are kept in bounds by others which are stronger or cleverer than themselves. The quantity of mice in a house will depend upon the presence or upon the efficiency of their prescriptive foes the cats. Should there be none of the latter, the vermin will increase until neither cheese nor candles are safe for a moment from their assaults. Should Tom or Tabitha happen to be a slovenly mouser (preferring stolen to legitimate fare), the good housewife grows indignant, and insists upon changing her feline police. A single energetic puss, who makes a conscience of duty, and is well up

to work like Whittington's famous quadruped, soon effects frightful havoc amongst the milk-sipping gentry, and eats them into order and moderate proportions. The island of Juan Fernandez once abounded with goats, which not only served as food for Robinson Crusoe in fiction, but for the buccaneers in reality. Anxious to deprive the freebooters of their provender, the Spaniards drafted a number of dogs to the spot, and speedily reduced the poor goats to such an extent that there were few left for the piratical trenchers. This accomplished, the dogs themselves began to decline for want of adequate fare. We can easily comprehend, also, why the inhabitants of the ocean are kept under constant restraint, since fishes, which have neither the opportunity nor the inclination to become vegetarians, must needs banquet upon each other; the larger species (and this is a very human sort of proceeding) bolting the smaller without the slightest compunction. Like their organic betters, vegetables, too, have their peculiar foes. Their seeds figure very prominently in the bill of fare of numerous insects and birds. In its youth, the hop-plant is preyed upon by a variety of flies; and when it arrives at maturity, the red spider, otter moth, and other scourges assail it with implacable fury, the larvæ devouring every part down to the very roots. Even weeds have their persecutors, and it is calculated that not less than fifty different insects earn their livelihood upon the nettle, some feasting on the leaves, some on the stem, some on the flowers, and others on the seeds.

But this is not the only kind of warfare which is constantly waged. Plant fights plant, and animals are indirectly engaged in mortal combat with their own kith and kin. If we could suppose a piece of ground perfectly denuded of all vegetation, we know that it could not remain so for more than a very short period. The down of the thistle, the parachutes of the dandelion, the spores of the mosses, the seeds of the grasses would speedily be conveyed to the spot. However carefully fenced it might be, the barrier would easily be surmounted, and the surface soon mantled over with vegetation without the slightest interference on the part of man. Let the ground, however, be already occupied, and what is the result? Still the vegetable germs which are wandering on the wind, prowling about for a place in which to take root, present themselves and seize upon the smallest vacancy they can find. Should the soil be better suited for their nourishment than for the support of the aboriginal races, or should the invaders be of a hardier and more vigorous breed, a struggle ensues, and the feeblest must necessarily go to the wall. The stronger will spread, encroach, and possibly exterminate the weak.

Does not this painfully resemble some of our human operations? A large town is already supplied with as many drapers or tea-dealers as the wants of the population require. Others, however, are anxious to make a start in the same business, and accordingly open establishments of their own. Their success must, of course, involve the subtraction of support from the older firms. The man of Hyson straightway mounts a golden canister, advertises his house as the cheapest in England, assures the public that his teas are of unexampled purity, bids you beware of the shop over the way, and endeavours by dint of hard puffing to absorb all the custom of the vicinity. The new draper is equally aggressive; he plants himself close to some brother in the trade; he is careful to inform his patrons that he has no connexion with the neighbouring house; he has always wonderful bargains on hand; he frequently baits his trap with 'clearance sales' at a 'prodigious sacrifice,' and thinks it essential to his own prosperity that his rival should be driven, if possible, to take refuge in the Bankruptcy Court. Now, as there are many influences which will affect the rival tradesmen in their race for public support, it is obvious that the man who combines the greatest number of these in his favour will eventually carry the day. He who possesses the largest capital, who indulges in the profusest promises, who sells at the cheapest rate, or who supplies his customers with really superior articles, may probably amass a little competency, whilst his opponent will some day call his creditors together, and offer them, to their great indignation, a composition of two shillings in the pound. Nay, may not the merest trifles, such as easier access, larger frontage, a sunnier aspect, improvement in neighbouring shops, a more polished bow or a more insinuating voice, sometimes suffice to turn the scale, and make the one prosperous, the other miserable? Just so those plants or animals which are best adapted to a given region—which are most eminently benefited by climate, soil, food, moisture, exposure, and other conditions of being, will, by a process of natural selection, be installed in the occupation of the spot, whilst those which are less pertinent to the locality must decline in numbers, or retire from the struggle altogether. It would be idle to fill an open garden with a number of delicate exotics; a few nettles and native grasses turned loose in the place would run them all down as surely as a lion, introduced into a fold, would munch up all the cattle it contained.

But how does this principle of selection bear upon the great question of species? When, from any cause whatever, nature departs from the standard type, and produces some peculiarity of instinct or conformation, she seems to inquire whether it will be for

the benefit of the animal that it should be preserved. If the answer be in the affirmative, there is a chance that the novelty will be perpetuated, because the creature has acquired an advantage over its competitors, and immediately begins to elbow the latter, thrusting them out of their place, if practicable, and appropriating the choicest sites or the choicest resources for its own behoof. Whether plant or animal, it apes the manners of mankind, and lords it over its rivals as if it had been brought up at court. The reason why the cuckoo drops her eggs in a foreign nest is, that as she lays them only at intervals of two or three days, some would be hatched long before the others were ripe, and the brood would, therefore, be most inconveniently developed. The American cuckoo, however, is not alive to the 'dodge' for which its European congener is so renowned. Were the two species, therefore, placed on terms of direct rivalry, there can be no doubt that the one which adopted this clever but impertinent practice, and regularly made a foundling hospital of its neighbour's nest, would perpetuate its race on much easier terms than its more modest or less brilliant competitor. No matter how slight the advantage, Mr. Darwin concludes that it will tell in the great struggle for pre-eminence, if, in other respects, the contending organisms are equally matched. Let a creature in a cold climate be born with a thicker fur than common, and its chances of preservation are greater than those of its brethren who are more thinly clad. Let the instinct of a beast of prey be sharpened, and it will manage to procure provender where another with a brain of more stupid texture would infallibly starve.

Singularly enough this contest rages most fiercely where the objects are most closely allied. When two plants of different character grow in the same ground, they do not draw upon the soil for precisely the same materials. 'I will take this,' says one, 'you may take that: plenty of lime for me, plenty of potash and soda for you. Let us be friends, and amicably divide our mineral resources, instead of quarrelling like cat and dog, or husband and wife.' But if a number of similar vegetables meet in one enclosure, each having the same wants and requiring the same diet, then a battle royal ensues, and the healthier individuals alone can make their footing good. In other ways, too, the results of this severe competition may be observed. See how the trees in a crowded forest are crushed together, so that instead of expanding laterally the branches soar upwards, in the vain hope that they will escape from compression, and find sunshine and freedom aloft.

And not only does individual war with individual, and variety

with variety, and species with species, but it would seem that there is an unnatural propensity on the part of all improved breeds to exterminate the stock from which they have sprung. For since the latter must now carry on the struggle at a considerable discount, they will gradually lose ground, and if the two are kept in constant conflict, the parent line will ultimately be ruined, and, indeed, extinguished by the younger race. 'In 'Yorkshire,' says Mr. Darwin, 'it is historically known that the 'ancient black cattle were displaced by the long horns, and then 'these were swept away by the short horns (I quote the words of 'an agricultural writer) as if by some murderous pestilence.'

Gloomy work, the reader will doubtless exclaim. Is it not enough that man is ever battling with man, and that beasts of rapine are always prowling for prey; but must we be told that the same hostile spirit invades our gardens, makes havoc in our groves, rages in the very dove-cot, converts placid pastures into theatres of strife, and in short carries carnage into every department of organic nature? Some seventy years ago there was a poet called Darwin, who charmed the public by his silvery descriptions of the loves of the plants. To him a crowded parterre was a sort of vegetable paradise, where roses flirted with roses, and the gay tulip, softened by his amorous woes, revealed the state of his affections to the idol of his heart in modest but touching strains. Now, however, there comes a naturalist of the same name under whose merciless philosophy the brilliant inhabitants of the garden are depicted as a band of deadly antagonists, all engaged in unnatural contention, and all prepared to starve their own brethren to death if the slightest advantage can be secured!

But look a little deeper. One good consequence, at any rate, must result. In this conflict the strong, the healthy, the more vigorous alone will survive. Just as the Spartans exposed their infants, so that the feebler necessarily succumbed—just as the diseases to which childhood is subject carry off the sicklier specimens of humanity, lest these should deteriorate the breed—so Nature provides that the hardiest organisms shall generally prevail. The tone of the vegetable world, the energies of the animal kingdom are kept up to 'proof' by this self-regulating process. If a creature subsists by plunder, the most powerful will be the likeliest to flourish; if a creature is destined to serve as food for others, the fleetest is the most certain to escape. Still further, it would seem, according to our author, that Nature is ever labouring to improve her productions. For if, on the appearance of any valuable modification in the character of a species, she

endeavours to perpetuate it by giving it at once the preference in the great standing strife, what is this but an attempt to equip the earth with 'picked' plants and 'picked' animals alone?

It will be seen, therefore, that this principle of Natural Selection constitutes the corner stone of Mr. Darwin's hypothesis.

Let us briefly recapitulate his leading views. Certain variations can be produced in domesticated animals by human arts and human attentions. Some of the breeds which have thus arisen exhibit such marked distinctions that many would be puzzled to say, on inspecting them without a knowledge of their genealogy, whether they were mere offshoots of the original stock, or members of an independent species. To assume that nature can be less ingenious or inventive than man would be to assume what is absurd. She therefore must frequently give birth to altered instincts and altered forms. These modifications are straightway submitted to the laws of natural selection, and preserved if useful, or rejected if unprofitable. Transferred from parent to child, the peculiarity becomes the distinguishing property of a particular race. Such a race naturalists have hitherto called a variety, but Mr. Darwin regards it as an incipient species. Give it time to develop itself fully—that is, to add up all the little increments of variation which Nature is supposed to supply—and it will diverge so far in character from other derivations of the same stock, that the common ancestor would scarcely recognise them as his own progeny; at any rate, his surprise would be as great as that of some old chieftain (founder of an ancient line) who, on returning to earth, should discover that one representative of his house was seated on a throne, and another working in a coal-pit. In fact, according to Mr. Darwin, the palings which were supposed to fence in each species invisibly, have no virtual existence in Nature—all is open common; and instead of presuming that an express act of creation was required for the production of each group, we are authorized to believe that the entire host of organisms we now behold, whether vegetable or animal, have descended from some half-dozen progenitors, or even from a single prototype. 'I can see no limit to the amount of change, to the beauty and infinite complexity of the coadaptations between all organic beings one with another, and with their physical conditions of life, which may be effected in the long course of time by Nature's power of selection.'

Now, what conclusion must be drawn from Mr. Darwin's production? We have read it with a feeling of unfeigned respect for his learning and abilities; we have read it with the fullest disposition to be convinced by his arguments and converted by his facts; but we close it with a very strong impression that the

case is 'not proven,' and that the evidence adduced is wholly insufficient to justify a reversal of the accredited doctrine that species are essentially immutable. Throughout the work we suspect that the reader's persuasion will be—'these data may be good, but they do not meet the requirements of the question. We are shooting at the moon, but we can never get a fact to fly higher than Mont Blanc; we are requested to believe that the John Smiths have all descended from Sesostris, but we have to patch up their pedigree with numerous hypothetical individuals, and after all we cannot fairly trace the house into Egypt, let us grope and genealogize as we will.' It is true that Mr. Darwin's volume contains a mere abstract of the materials he has collected; he reserves the bulk of his facts for a later and a larger production. With the modesty of a great mind, he admits that there is scarcely a single point discussed in the work upon which counter evidence may not be advanced, and from which counter conclusions may not be legitimately deduced. But still from the very nature of the inquiry—the process of manufacturing a species demanding ages for its accomplishment, and all direct proof being apparently unattainable—we cannot conceive that the best assemblage of facts, however skilfully marshalled, however cleverly supported, could do more, under any circumstances, than barely suffice to carry the *probabilities* of the case.

'Might have been' is not 'must have been.' Patent as this principle appears, it is just the one which a theorist is most apt to overlook, but which a reader should be most careful to remember.

Now as the power of evolving varieties is the starting point with Mr. Darwin, it should be observed, in the first place, that his inferences are drawn from the behaviour of *domesticated* plants and animals. That these admit of sundry modifications no one will venture to dispute; but why is it that one creature is mild and docile, whilst another is fierce and intractable; that one readily attaches itself to man, and becomes, like Byron's Boat-swain, his

'Firmest friend,
The first to welcome, the foremost to defend,'

whilst another eats him up whenever he can catch him, unprotected, in the jungle or the desert? The reason we cannot exactly explain; but this we do know, that the faculty of submitting to cultivation is associated with certain conditions, which constitute a broad line of distinction between the tame animal and the irreclaimable animal. Sheep and oxen are quiet herbivorous quadrupeds, living gregariously, and constitutionally adapted to the service of mankind. Lions and tigers are solitary brutes, who would scorn

to feast on grass or turnips; whose teeth, claws, and intestines, are purposely suited to a predatory existence, and who are incapable of rendering any assistance to the 'chief mammal,' except in drawing the car of a mythological god, or amusing the visitors at feeding-time in a menagerie. The domestic tendencies of the former may, therefore, well imply that they are more plastic in their habits and organization than the latter. If the question be what man can do in 'touching up' or altering any particular form, we naturally conclude that the best subjects for his experiments would be found amongst those creatures which have been specially assigned for his use. Hence the quantum of variation produced in the sheep, the ox, the horse, the dog, can hardly be accepted as a certain criterion of the changes which may occur in the bear or the hyæna. If the common barn-fowl admits of diversified breeding, it does not follow that the vulture must be equally flexible in its constitution.

Nor does this principle of modification apply with similar force to all domesticated creatures. The cat will furnish us with a test-case. Puss is certainly a household animal; she is dear to mistresses who have an antipathy to mice, and dearer still to maiden ladies whom the lords of creation have scandalously allowed to lead a solitary life. For these reasons, if for no other, we might expect that the cat would exhibit almost as great a diversity of character as the dog. But it is not so; the varieties are extremely limited. To keep up a substantive breed is almost impracticable. Mr. Darwin, whilst acknowledging the fact with his usual candour, concludes that the explanation is easy. Puss is notoriously addicted to roaming at night. The excuse she makes for her conduct is that she is particularly fond of moonlight melody, and that she sallies out to practise music on the house-tops with a friend who lives at the next door. We know better, of course. From this disreputable habit it follows, according to Mr. Darwin, that no feline variety can be upheld in its integrity. We cannot, however, accept the solution. To say nothing of the difficulty of assuming that all peculiarities are obliterated by these promiscuous unions, since it is already conceded that there are few varieties to intermix, we think it safer to conclude that the cat, a semi-carnivorous creature, possesses a less ductile organism than a purely herbivorous brute, and that the species cannot be broken up into breeds with the same readiness and permanent effect.

Many other instances might be adduced to show that the power of modification differs even amongst the animals which are directly enlisted in the service of man. We have many diversities of horse in this country, but (to our credit be it spoken)

we are not equally rich in asses. We do not see the asinine element appearing at one time in the shape of a dray-donkey, and at another of a Shetland pony with long ears and a melodious bray. Our author intimates that the animal is mostly a poor man's appurtenance, and that, consequently, no attention is paid to the production of new breeds. But, whilst admitting that the quadruped has no fashionable status in England, and that ass-fanciers—genuine amateurs of the species—are unknown, we suspect that the rareness of varieties is due to the constitutional inflexibility of the brute. It is worthy of note also, that most of our domesticated insects are remarkably unpliant in their character. The house-fly is found in company with man in almost every part of the globe, settling on his nose whenever he appears: the hive-bee makes him honey and wax, and lives as social a life as its great superior; yet these little creatures never seem to betray any instability of organism, or to throw off any new or divergent tribes.

Further, it happens very unfortunately for a theory which depends upon the variability of domestic animals, that the moment the care of man is withdrawn, they exhibit a tendency to return to their original condition. Symptoms of apostacy appear, and the fallen creature resumes as quickly as possible the ancestral modes of life. Let the most polished race of dogs be turned loose on a desert island, and, in the course of a generation or two, they will forget all their good manners, and lapse into a state of downright barbarism. Pallas tells us that the wild horses of the Don have sprung from progenitors employed by Peter the Great at the siege of Azoph in 1696. Not having sufficient forage to maintain his chargers, they were set at liberty, and soon acquired the peculiar habits of their brethren of the steppe and the marsh. Breeders of sheep know well that sleepless attention is needful in order to preserve a particular 'strain' in all its purity. Gardeners are well aware that if the refined flowers and valued esculents, which long culture has enabled them to produce, are left to themselves, they will soon exhibit a deplorable amount of degeneracy. The fact is, that when you hand a modified plant or animal over to 'Nature,' her great object appears to be to obliterate the peculiarities you have elicited. She seems to say, 'This change is quite artificial; it may be good for the human race—if so, keep it up by watchfulness and industry. Your business is to make the best of creation; but, if you relax your diligence, I shall probably expunge the novelty, and restore the race to its primitive condition.'

But, waiving all minor points as to the variability of domesticated organisms, the next question is, how far will the fact of

such variability carry us in our speculations. Into a new species? That is the difficulty! To say that particular breeds can be produced is nothing. To say that these breeds may differ very largely from each other is next to nothing. We have a line to throw across a chasm, and if it fails to reach the opposite bank, though it fail by a single yard, our labour is wholly lost. This is precisely the logical position of Mr. Darwin. Say rather he is like a man who would fain conclude that, because a number of piers project into the sea from the British coast, it would be quite practicable to prolong them right across the ocean so as to open highways of intercourse with the shores of France and Holland. If the question be put, 'Can you lay your finger upon a single variety which has passed into a genuine undeniable species—one so marked that no naturalist would dream of contesting its pretensions for a moment?'—the answer must be a melancholy shake of the head. The number, or even the oddity of the breeds which may be evolved from any given stock should not cheat us into erroneous conclusions. There are many diversities in the human race, and it is possible that these might be considerably increased by skilful management; but should we, under any circumstances, be justified in saying that we had established a new species? Suppose that a whimsical despot were to make a law requiring all the hunchbacks throughout his dominions to intermarry; and by imposing severe penalties on their union with others he were to originate a race of people all burdened with bosses as certainly as the camel is with a hump? Or say, that a monarch with a passion for tall grenadiers, like Frederick William of Prussia, could grow whole armies of gigantic troopers? Or assume that, by picking out all the remarkably stout men and women who are exhibited at country fairs, or who could be collected from different parts of the world, and then, by pairing their issue for many generations, we could cultivate corpulence in them as we do in prize cattle, and at last establish a succession of Daniel Lamberts upon the globe? We might even imagine a race of living Apollos and Venuses—beings so noble in limb and beautiful in aspect that it would seem treasonable to class them with the stunted Esquimaux, or, still worse, with the shapeless and degraded Bosjesman. But what of all this? Why, if every individual on the planet were the sole representative of a particular breed, we should not have added a single new species to the genus Homo. All might still comply with the great specific test, and, by intermarrying, perpetuate themselves in their posterity.

But, secondly, the question is not as to the amount of change which man is competent to produce. The formation of a new

species is supposed to be effected by Nature herself. Now, we can readily comprehend how a fancier of cattle may cherish any peculiarity which appears. If he wishes to procure a race of oxen with long horns, or sheep with fine wool, he must mate them with specimens in whom the same characters are displayed, and then, by long continued selection, a property, otherwise fugitive, may be arrested and embodied in a definite breed. But how are brutes to accomplish this for themselves? What is there to induce two creatures, having some slight eccentricity of organization, to pair for the purposes of progeny any more than there is to induce a gentleman with a Roman nose to make an offer to a lady, simply because she has a Roman nose as well? The only self-acting agency of any importance to which Mr. Darwin refers is that of 'sexual selection.' The stronger and more courageous the creature, the more readily will it succeed in its struggle for a temporary partner. After a battle, the feebler chanticleer retires from the yard, and leaves his competitor in peaceful ownership of the flock. But the result is not ruled by any question of modification in form or habit. All that we can say is, that the fowl which has the sharpest spurs or greatest pluck, the stag which has the thickest skull or the largest antlers, the male salmon which has the most powerful hooked jaw, possesses the best chance of continuing its race. But, whether any peculiarity of breed shall be transmitted to the offspring is a matter which is no more put in issue by the success of the stronger suitor than it would be by the success of the weaker.

Nor is the grand struggle for place and pre-eminence upon which Mr. Darwin lays so much stress sufficient to supply the hiatus in his argument. Correct as the principle undoubtedly is in many respects (and earlier naturalists than himself have depicted the great warfare of organisms with similar force), it is plain that victory is not a question of simple divergence from the primitive type. We cannot see how the addition of several tail-feathers to the pigeon, or of a tuft to the breast of the turkey-cock could better the fortunes of these animals in the battle of life. So trifling are all modifications when they first appear—so many ages are required to give them any prominence by means of natural selection alone—that to expect any immediate results would be like saying that a single penny, added to the capital of a merchant, should enable him to outstrip all his brother merchants in the race for opulence. When the *locale* of a creature is changed, when it is transported from one country to another, or from a mountainous region to the plains, certain changes will ensue in its clothing or in its habits, in order that it may adapt itself to its altered environment. But these are forced upon it

by the climate; for otherwise it must speedily perish, and even when accomplished, they only suffice, if they do suffice, to place it on the same level of security as the aboriginal tribes.

Further, it is not only necessary, according to Mr. Darwin, that nature should select a peculiarity, but she must augment it. For ages she must contrive to accumulate little items of divergence until they attain sufficient magnitude and importance to constitute a separate species. Now, granting that there were any guarantee for the transmission of a particular oddity from generation to generation—and here we have another hitch in the argument—what assurance do we possess that this oddity will be gradually increased? None whatever. Instances have occurred in which children have been born with six fingers on the hand. Let a case of this sort arise in England, and suppose that by searching the world round we discover a person of the opposite sex with a similar surplus in the digits. We tell them they ought to marry for the good of science. They are obliging, and do marry for the good of science. Physiologists are on the alert, and look forward to the results with considerable interest. To their great delight we will say that an extra finger crops out in several children in succession. We will go further. Perhaps the grandchildren and most of their progeny are similarly characterized. But what then? We do not expect that Nature will now proceed to add a *seventh* digit to their hands; still less that she will continue to augment the number until the owners are able to accomplish an unlimited quantity of picking and stealing if they think proper. Doubtless were a real Briareus to be discovered, Mr. Darwin would explain his existence by saying that he was the representative of a race (nearly extinct) which had gone on producing hands, until a hundred had accumulated on each of their frames. We are well aware that our author would insist upon treating a tribe of six-fingered individuals as a separate species, but no one doubts that their unions with the ordinary sons and daughters of men would be just as productive as in five-fingered matches, and that, unless the breed were forcibly insulated, the anomaly would eventually vanish. But if Mr. Darwin prefers a more limited illustration, we would ask whether, in case an exaggerated nose were to appear in a family, there would be any reason to expect that it would continue to increase in bulk, as it was handed down from parent to child, until it attained treble the ordinary dimensions?

And not only is proof wanting that there exists any tendency to capitalize a peculiarity—to fund it, as it were, in the shape of a new species—but the absence of all those measures which enable men to rear a particular stock must render it extremely

difficult to raise and preserve a distinct variety by purely natural means. Animals will intermix, if left to themselves. There is small chance, therefore, that any minute element of divergence will be allowed to expand until it becomes the dominant quality of a race. We have seen that, when Mr. Darwin has to explain why cats presents so few varieties, he points to their habits of promiscuous intercourse as a sufficient solution. But his theory is so elastic, that it sometimes takes in the most opposite cases, and even fattens upon facts which we should deem positive poison. He admits that isolation is an important item in the process of natural selection, for it is by that means only that intercrosses can be prevented amongst creatures of the same character; but he immediately asserts that large and open areas, where intercrosses must necessarily abound, are still more favourable to the production of permanent species.

In fact, we cannot but think that one of the frailest parts of the theory is the office which our talented author assigns to Nature in the cultivation of physical peculiarities.

‘As man can produce, and certainly has produced, a great result by his methodical and unconscious means of selection, what may not Nature effect? Man can act only on external and visible characters, Nature cares nothing for appearances, except in so far as they may be useful to any being. She can act on every internal organ, on every shade of constitutional difference, on the whole machinery of life. Man selects only for his own good; Nature only for that of the being which she tends. Every selected character is fully exercised by her; and the being is placed under well-suited conditions of life. Man keeps the natives of many climates in the same country; he seldom exercises each selected character in some peculiar and fitting manner; he feeds a long- and a short-beaked pigeon on the same food; he does not exercise a long-backed or long-legged quadruped in any peculiar manner; he exposes sheep with long and short wool to the same climate. He does not allow the most vigorous males to struggle for the females. He does not rigidly destroy all inferior animals, but protects, during each varying season, as far as lies in his power, all his productions. He often begins his selection by some half-monstrous form, or at least by some modifications prominent enough to catch his eye or to be plainly useful to him. Under nature, the slightest difference of structure or constitution may well turn the nicely-balanced scale in the struggle for life, and so be preserved. How fleeting are the wishes and efforts of man! how short his time! and, consequently, how poor will his products be, compared with those accumulated by nature during whole geological periods! Can we wonder, then, that Nature’s productions should be far truer in character than man’s productions; that they should be infinitely better adapted by the most complex conditions of life, and should plainly bear the stamp of far higher workmanship.’ (p. 88.)

Now, in this there is something which, coming from many men at least, we should venture to call wilfully perverse. Proceeding from Mr. Darwin, we are content to ascribe it to the flickering vision produced on the mental retina when a person has long lived in the glare of a favourite theory. He conjures up a personal principle under the designation of 'Nature,' and seems to assume that this power is constantly controlling the affairs of the vegetable and animal kingdoms, and dealing with every plant and beast as if they were the objects of its direct and unrelaxing attention. Good, very good, if the term 'Nature' be rightly defined; but if we are expected to believe that a field, when abandoned to the weeds, or a race of quadrupeds, when turned out of society and allowed to run wild, is taken under the care of any intelligent power which modulates physical circumstances, as man can do by virtue of his volition, we must demur to this poetical but unscientific conclusion. It is precisely because 'Nature' wants the methodical means of selection which man possesses that we are precluded from expecting the methodical results which man produces. Singularly enough, one great object of Mr. Darwin's theory is to refute the idea that an independent act of creation was requisite for the origin of each species. Yet, spite of this belief, he seems to recognise the presence of some voluntary principle which is incessantly occupied in cultivating small physical modifications, nursing profitable peculiarities, and extinguishing old or superannuated races.

Thirdly, the theory is one which admits of little verification. From its very nature, and from the enormous intervals of time required for the evolution of a new species, it is obvious that few facts in our possession can be brought to throw any direct and decided light upon the question. But it so happens that there are two sets of data—the one modern, the other ancient—by which we may test the hypothesis; and both of these appear to us to be completely antagonistic to Mr. Darwin's views.

There is hybridism. If we cross an animal of one species with an animal of another species, they may breed, but the issue will be incapable of continuing its kind. The horse and ass will produce a mule; but mules, when paired with each other, are notoriously infertile.* Their sterility does not arise from any accidental circumstances, but is due to the imperfect condition of the reproductive organs. It is pretty much the same with plants. As a general rule, prolific progeny cannot be obtained from the illegitimate issue of two alien species. Kölreuter and Gärtner,

* *Egregium, sanctumque virum si cerno, bimembri
Hoc monstrum puero, vel miranti sub aratro
Piscibus inventis et foetæ comparo mulæ.—Juvenal.*

the two great experimentalists on this subject, affirmed that the principle admitted of no exceptional cases, and that, whenever hybrids did really propagate, it was only by marrying with an individual of the pure stock for the occasion. It is true that the observations of the Hon. and Rev. W. Herbert, in regard to vegetables of kindred species, are somewhat hostile to this conclusion. But, so far as the animal world is concerned, Mr. Darwin himself admits it to be doubtful whether any case of 'a perfectly fertile hybrid can be considered as thoroughly authenticated.' And even if the characteristic sterility of these mongrel products admits of mitigation, it is only when they are subjected to the domesticating influences of man, for Nature will do nothing in this particular to favour the theorist's views. She sets her seal of reprobation upon all unions between creatures whose structure and functions are clearly distinct. A feeling of aversion has been implanted, as if to show that they were never intended to coalesce. Left to themselves, there is no chance that the mare will ever bring forth a hare, as Herodotus reports, or that quadrupeds of various kinds, as Aristotle relates, when compelled to collect in the Libyan deserts around the springs will engender a variety of new forms; whence the proverb *ἀει Λιβύη φέρει τι καινόν*. On the other hand, it is well known that individuals belonging to the same variety, or to different varieties of the same species, can be united in the bonds of wedlock without the slightest difficulty. Surely this is an intimation on the part of Nature that, whilst all liberty is given within certain limits, it is not her purpose that the partition walls of species should be broken down merely to introduce mongrel and unproductive breeds.

The other set of data to which we adverted are the fossil relics of the primeval earth. If any one were to ask Mr. Darwin to take us into Nature's workshop, and show us a new species in the act of evolution, or an old one in the course of extinction, he would very properly reply—'No; this is a work which extends over ages, and I cannot give you any evidence which you will consider conclusive.' Fortunately, however, the zoology of the whole pre-Adamite period is chronicled in the rocks of our globe. Here, therefore, we may expect to discover proofs of the mode in which species have really arisen. Now, many tests might be adopted. Some geologists, like D'Orbigny, have classified the organic remains of the earth into a series of nearly thirty stages, alleging that its flora and fauna have been destroyed a corresponding number of times. On each occasion it is affirmed that a new staff of plants and animals was produced, and that these were the result of a distinct creative command. But, as many other geologists deny that there has been any solution

of continuity in the case, it would scarcely be fair to submit Mr. Darwin's theory to a criterion which, if correct, would crush it in a moment. Waiving scores of kindred questions, however, we have a right to say, 'How do you account for the multitudes of species which *did* suddenly appear at different periods 'in the world's history? Where do you find the true originals—the archetypal animals—from whom all the existing as well as 'defunct species have been derived?' Mr. Darwin's answer is remarkable. The lower Silurian strata are generally supposed to afford the first evidences of organic life; but the author boldly affirms that, long before the deposition of these beds, probably for ages equal in extent to the whole of the fossiliferous eras, 'the world swarmed with living creatures.' A happier device for a speculator could scarcely have been adopted; for, since all trace of these pre-Silurian organisms has been destroyed, Mr. Darwin has thus provided a place of retreat for his theory, where it may nestle in perfect security whenever he is hotly pursued. For it is quite competent for him to contend that, if these earlier relics *had been* preserved, they would have furnished him with all the evidence he required. Should John Smith maintain that the pedigree which might have proved his descent from King Sesostris was burnt in the Alexandrian Library, could you be so uncivil as to tell him that it would not have bettered his case even had it survived that bigoted conflagration?

Take, however, the rocks whose contents really continue unobliterated. These should necessarily bear testimony to the truth of the theory by supplying us with numerous intermediate links between one organism and another, for 'if species have descended from other species by insensibly fine gradations,' we may expect to discover 'innumerable transitional forms.' But our author is at once compelled to admit that such transitional forms are not to be found. The fossiliferous rocks are relentless on this point. They wont protect his theory from 'the gravest objection' which can be urged. What is to be done? In this extremity Mr. Darwin simply challenges the completeness of the geological book. Like a torn and mutilated volume of natural history, sundry figures, pages, and even chapters are wanting; and, therefore, the series of animals which it discloses is imperfect and inexact. Only a small portion of the earth's strata has been explored; if the rest were properly examined, all the missing links might be detected, and then —

Many other points we had pencilled for consideration. Some inaccuracies, too, might have called for remark; but these it is never a grateful task to notice. A few words, also, on the theological aspect of the question, would not, perhaps, have been

entirely misplaced. But exhausted space compels us to conclude. In doing this, however, let us not fail to express our high appreciation of a book which is novel in its scope, thoughtful in its suggestions, and eminently enterprising in its philosophy. It is certainly one of the most candid productions we have perused. So deeply is the volume impregnated with this virtue, that the author sometimes appears to be arguing 'dead' against himself. And if we cannot shut our eyes to a certain slipperiness of logic—due, in some measure, perhaps, to the very largeness of the concessions he is induced to make—we gladly remember that Mr. Darwin has had to grope his way along a dark and arduous path, and to battle with a host of difficulties, beneath which a less confident and valorous inquirer would undoubtedly have succumbed. Nor must we forget that another naturalist of note, Mr. Wallace, whilst pursuing a track of his own, has simultaneously arrived at the same general result as this able and adventurous philosopher.

ART. VI.—*The Autobiography of a Seaman.* By THOMAS TENTH EARL OF DUNDONALD, Admiral of the Red, Rear-Admiral of the Fleet, &c. Vol. I. London: Richard Bentley. 1860.

MANY are the soldiers who in ancient, mediæval, and modern times have given us their memoirs, and have thus added valuable contributions to history. Julius Cæsar and Frederick II., Catinat and Villars, Prince Eugene and Marshal Saxe, Napoleon, Masséna, Suchet, Marmont, and scores of others, have left behind them commentaries, memoirs, sketches, and chapters of military history, which will serve the purposes of autobiography. But we are not aware that in the sister naval profession, though decidedly more scientific and possibly more learned than the military, there are any works written by great admirals and naval commanders, detailing the hard career of duty, or recording the great naval battles in squadron, or the single actions in which they, and their ship or ships, have been engaged. Though the seamen of Elizabeth's time, such as Howard of Effingham, Howard of Suffolk, Sir Francis Drake, Sir Walter Raleigh, and others, were accomplished scholars as well as commanders, yet we owe the history of the events in which they took part, not to their own pens, but to the accounts of Camden, Hakluyt, and Samuel Purchas, and to