Dedicated by permission to His Grace the Archbishop of York.

DIFFICULTIES OF DARWINISM.

READ BEFORE THE BRITISH ASSOCIATION

AT NORWICH AND EXETER

IN 1868 AND 1869.

WITH A PREFACE AND

A CORRESPONDENCE WITH PROFESSOR HUXLEY.

BY

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'The old questions whence men come and whither they go, and what is the end of all their labour, still perplex philosophers and trouble the simple. The anxieties of the human soul force their way even through French logic into the midst of the Positive Philosophy. As long as such questions are asked, so long will there be an ear for an answer, and the truth which dispersed all human dreams in the third century has the power to disperse them again.'—TIMES, *Oct.* 1869.

'The highest intellect which issues in no *certainty* has completely *failed*.'—THOMAS CARLYLE, 1869.

'Every few years some reformer or another has sprung up . . . . and all past as well as all present experience further shows, that the greater the degree of dogmatism and effrontery with which any such pretender proclaims his doctrine, the greater in all probability will be his success in gaining patrons amongst the credulous public.'—SIR J. Y. SIMPSON, Bart., M.D.

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'There is a struggle for existence leading to the preservation of each profitable deviation of structure or instinct.'

'If one species has any advantage over another it will, in a very brief time, wholly or in part supplant it.'

'The very process of natural selection constantly tends, as has been often remarked, to *exterminate the parent forms* and the intermediate links.'

'All the intermediate forms between the earlier and later states, *as well as the original parent species itself*, will generally tend to become extinct.'

'The whole history of the world as at present known, although of a length quite incomprehensible by us, will hereafter be recognised as a mere fragment of time, compared with the ages which have elapsed since the *first creature*, the *progenitor* of innumerable extinct and living descendants, was created.'

'Life, with its several powers, having been originally breathed by the Creator into a few forms or into ONE.'

'Innumerable species, genera, and families of organic beings have all been descended, each within its own class or group, from COMMON PARENTS.

'I believe that animals have descended from *at most* only four or five progenitors.'

'Analogy would lead me one step further, namely, to the belief that all animals and plants have descended from *some* ONE *prototype*.'

'I should infer from analogy that probably all the organised beings which have ever lived on this earth, have descended from *some* ONE *primordial form*.'

DARWIN.

PREFACE.

'Three papers were read, making three separate attacks from three different quarters on the famous theory. They may be briefly described as religious, physical, and metaphysical.

'(The second of these) was by the Rev. F. O. Morris, an authority on birds and butterflies, and was entitled "The Difficulties of Darwinism." Mr. Morris was unluckily absent, and his paper was consequently condemned to be read by an inaudible secretary, whose utterance the assembly soon gave over the attempt to follow. So far as it could be heard, it appeared to consist of a number of difficulties in detail, the value of which they would probably have scarcely the sufficient knowledge to estimate aright.'—*The Guardian.*

THE above passage from the *Guardian* newspaper referring to a paper I had just had read before the members of the British Association at Exeter, furnishes a sufficient reason for my putting my views on Mr. Darwin's theories in print, even if I had not previously intended to do so.

I only regret that I did not put the remarks I offered to the meeting at Exeter in the form of questions, as I had done in the paper I read at Norwich the preceding year, for the disciples of Darwinism to answer if they could. I do not believe that a single one of these questions can be satisfactorily answered, but even if half the number could be, they would leave the other half to testify against the egregious extravagance of the system; nay,

if only one single such question remained unanswered because unanswerable, the whole of their flimsy fancy falls to the ground.

There does seem to be no limit to human credulity, and if only, as I have before remarked, any one should propound a notion more extravagant than any that has preceded it, he will be sure of followers to his heart's content, equally visionary with himself.

There is also something worse than this. There is the complacent stereotyped assertion that all objections to Mr. Darwin's baseless theories have been already answered, and when asked where such answers are to be found, the want of the manliness to confess that the statement was untrue, and was known to be untrue when made, and that it cannot be substantiated.

A 'professor' should not be the person from whom such conduct should be looked for, but this is the Royal road to appearing very wise in the eyes of the weak-minded, and thus to 'draw away disciples after him.'

Substituting only the words 'Jermyn Street' for 'New York,' and 'Professor Protoplasm' for 'Doctor Positivus,' I commend the remarks of the *Saturday Review*, which I shall quote in the concluding pages, to the common sense of those who may have the good fortune not to be altogether devoid of that not unuseful quality. They are refreshing after the outrageous absurdities of our modern philosophers of the nineteenth century, whose standing motto appears to be 'no doubt we are the people, and wisdom shall die with us.' They discover a meaning in Mr. Darwin's theory which no one but themselves can see, 'veluti Balbinum,' etc.: they alone can understand him! no one else can! they have discovered the great

ARCANUM! *Eureka!* 'Glory be to'—the *Goddess of Reason!!*

It seems to be a favourite device with these persons to make it a rule when one after another attacks the Darwinian theory, to assert roundly that no one understands his meaning but themselves, and then by having a packed meeting to applaud the assertion, they can magnify themselves to their own entire satisfaction.

Mr. Darwin's own words are as plain as words can be, and any person of common understanding can have no possible difficulty in seeing at a glance the meaning of every sentence in his book, but to put a stop if possible to the like barefaced assertion in future, I have printed herewith his own words, and whether they are not plain enough for anyone to understand, I leave with my readers to decide for themselves.

As a Life Member of the British Association since its second meeting at York in 1844, I believe I express the desire of a large number of the members, that Section D should no longer be left in the hands of a small busybody clique who have banded themselves together to cry down every attempt to disabuse the public mind of the pernicious principles to which the doctrines in question necessarily tend, and I, I will not say for one, but for many, share in the foreboding of the *Times* in speaking of the appointment of Professor Huxley to the presidency for the year 1870—'There seems to be a very general feeling that Professor Huxley in the chair of the British Association will be in as difficult a position as Mr. Bright in the Ministry. He is the champion of views to which large classes of persons entertain very strong objections, and however discreet he may be in the absence of opposition,

his best friends tremble for him if those views should be impugned. The great object of the British Association is to render Science popular, and this object is best promoted by a president whose name is not identified with one side of an unsettled question, and whose declared opinions are not calculated to provoke any kind of antagonism.'

I hope the leaders of the clique will have wisdom enough to take advantage of this judicious note of warning the *Times* gave them, and draw in their horns before running a tilt against the common sense and the Christianity of the country.

In the following pages I have put the argument in the form of questions, which the supporters of Mr. Darwin's theory may answer *seriatim* if they can.

Let them take, to begin with, the one I asked them as to whether the 'Natural Selection,' the ἐνέργεια ψυχῆς in the case of an insect is exerted in the egg, the larva, the chrysalis, or the imago state, the more or less long period of the three former stages, or the brief and short-lived existence of the last-named? What is the very meaning of the word Ephemera! 'Poor insect! what a little day of sunny bliss is thine!' and when they have got over this *pons asinorum*, let them take as their next 'crux' the trifling difficulty raised by the question I asked, whether the 25,000 separate lenses in the eye of a beetle, the 17,000 in that of a butterfly, the 12,000 of a dragon-fly, or the 4,000 of a house-fly, were acquired by 'Natural Selection' in the short life of the insect which now finds them necessary to its being, and must always have done so, or if not necessary before, they must be unnecessary still. Then they can go on to the others one by one, but there must be no more evasions such as were openly com-

plained of at the Exeter meeting; no more false, and known at the time to be false, assertions that all these questions have been already answered. They have not! If they have, when? where? and by whom have they been? Let this be query number three, and when all these questions have been fairly answered, then will be the time to deal further in vague generalities.

I have only to add, that if any persons desire to see a masterly exposure of the petty and shuffling manner with which any attacks on the Darwinian theory are wont to be met, I heartily recommend them to purchase a pamphlet recently published by Dr. McCann, of Glasgow, entitled 'Anti-Darwinism,' in which he thoroughly shews up the unmanly conduct of a certain 'professor' at the meeting at Exeter, and the ignorance of his laudatory admirers, whose credulity seems exactly proportioned to his capacity for supplying its claim upon him. A more amusing and damaging rejoinder it would be difficult to meet with, or one more well deserved. 'Thorough' is its motto. He handles the 'professor' with a strong and determined grasp, and pins him down to his own written statements, which, as was most truly stated in public at the meeting, he had 'shirked' the being taxed with, when unable to meet his antagonist fairly even on his own ground. The 'professor' writhes and writhes again under the north-countryman's most just castigation, but the sturdy Scotchman holds him fast as with the grasp of a vice, from which he cannot escape. He had better for the future bear in mind the motto of the old Baron of Bradwardine, under his crest of the bear, and 'Bewar the Bar.'

NUNBURNHOLME RECTORY, HAYTON, YORK,
November, 1869.

My only difficulty, in the following remarks which I have put together, has been in the want of time and space requisite for answering such a work on an occasion like the present. For, as has been well observed by a great writer, 'a lie believed but for an hour, doth often more harm than can be repaired in many years,' and so even a single assertion in a work like Mr. Darwin's, however specious and daring it may be, may require far more space to answer it than it is intrinsically worth, and when he spins out his facts, real or supposititious, to two volumes of closely printed matter, it is obviously far beyond the limits of a paper to be read before the British Association to answer them as they might most thoroughly be answered.

I commend to Professor Protoplasm's serious attention the concluding remarks, which I have taken from the *Saturday Review*, every word of which I desire to endorse. He will have a serious reckoning with his own conscience to make up, when he shall one day be forced to *reflect* and think upon what good or harm he has done in his day and generation. Infidelity is a fatal rock to 'make shipwreck' on, in the dark night which is drawing on to him and those who are fellows with him in his folly. The 'Professor' and his party will do well to take warning in time, and steer clear of the 'dangerous downfall' of the shoals and quicksands they have drifted into. It is all very well *rem variare prodigaliter unam*' '*currente calamo*,' but the upshot of it all leaves the matter just where he and they found it, and where he and they will have to leave it. They have proved nothing, absolutely nothing. The whole idea is simply monstrous. Horace of old describes the maid as going no lower than a mermaid—*desinit in piscem mulier formosa superne*—but these 'filthy dreamers' 'defile the flesh,' 'speak evil' of the dignity of man, who was made in the 'image of GOD,' and when they have gone down, *pari passu* with the heathen, from man to a monkey, sink themselves lower and lower in the depths of degradation, and go yet down and down to the ignoble, foul, and detestable source and origin of all in a mere monad, the very name itself outlandish and 'Heathen Greek.'

Out upon the vile and accursed thought!

The only imaginable argument in favour of this degraded and degrading thought is, that it should have been possible for such a low-lived conception to have ever entered into the mean mind of anything in the shape of a man.

Effrontery may go down for a time with dupes, but will never pass current in the long run. I appeal with confidence to the COMMON-SENSE OF THE PEOPLE OF ENGLAND.

*** The corrections, &c. it has been necessary to make in these papers, have been so few and unimportant that I have not thought it necessary to specify them.

DIFFICULTIES OF DARWINISM.

THERE has been, until recently, but one doctrine as to the species of the various genera, classes and orders into which animated nature has been divided by systematists.

At the present time there are two. The old belief was, that a species—subject indeed to variety, both of a distinct and permanent, and of an accidental or temporary kind—(no two individuals, in fact, of any species of living creature being absolutely and identically alike in every one, or perhaps in any one, of its features), was still a separate kind of itself; that it was *sui generis*, if so one may say of a species, and had so continued from the moment of the original creation of its first ancestors, as such. That the swallow of to-day was of one and the same kind with the swallow that skimmed over the waters in the primeval days of the earth; the whale the same whale that then took its pastime in the great deep; the moth the same moth that found the shades of evening congenial to its nature; the leopard the same spotted leopard then as now.

There have been various argumentative discussions published on either side of the theory promulgated by Darwin, but they have, as one may say, each and all been enveloped in a cloud of scientific, or would-be scientific, sesquipedalian phraseology and high-flown words which must in most cases leave all ordinary readers either just where they were, or but a step removed from that position. I propose to approach the subject from the point of view from which an ordinary inquirer may be supposed to

look at it, and to ask a few plain questions which, as they can or cannot be plainly answered, may tend to dispose of the theory.

With the facts of nature before us it need not, as it seems to me, require a philosopher of some extraordinary ability, or one who can bring to bear the researches of a lifetime on such a question, to meet the arguments by which the new theory is attempted to be upheld. I maintain that every ordinary person of fair average ability is perfectly competent to approach the discussion, and that any one whom the records of the Oxford schools will show to have been sufficiently acquainted with the metaphysical and other writings of Aristotle and Bishop Butler, Pliny and Paley, and others of the ancients and moderns, may take leave to enter on the discussion, while eschewing the temerity of attempting to dogmatise about the question raised.

It has in all ages, till recently, been believed that, subject indeed to the small and trifling differences between individual and individual, more or less perpetuated, already alluded to, such differences being the result, not so much of an intermitted law as of an universal law of intermission, the creatures were, like Him who created them, without either 'variableness or shadow of turning.'

The new theory is, that so-called species are not the descendants of original first parents of the same distinct kinds, but that they are the offspring and offshoots, in the lapse of vast ages, by the process of what is called Natural Selection, of a more limited number of forms, and these again themselves from fewer still, and so backwards and backwards, fewer and fewer, until we arrive at some half-dozen, or two, or three, or four sources of all animals, and the like number of all plants, or, as is thought still more likely, on principles of analogy, at the root and origin of all in one and the same, a mere unit, the prolific source, cause, and prototype of the whole of animated nature.

The result of this startling theory, if carried to its legitimate extent, is then, that not only species but genera, not only genera but orders, not only orders but classes, all classes under which

the creatures have been hitherto arranged by naturalists in all ages, were but one and the same originally, had one common source of being in some one first parent or pair of parents;—that the lion and the lamb, the hawk and the eel, the humming-bird and the spider, the butterfly and the toad, had all one single original from which they at first sprang, and that they have only assumed their present forms through tendencies which, making use of fortuitous advantages, acted upon individuals of the gradually increasing types of forms in the various ages of their existence. Nay, not only so, but that even man himself, as well as the so-called species of creatures, had one and the same ancestry—each '*alter et idem*'—now different, but once one and the very same.

Now, no one disputes but that some supposed species are not species. It is no new thing to have discovered this: no catalogue of insects, for example, has been published, which, while it added a greater or less number of newly discovered species, did not at the same time strike out of the list many which had been previously admitted into the ranks on insufficient grounds. These were, in fact, discovered and proved, by more frequent or more careful comparison, to be merely varieties as I have said, either permanent or temporary, and mistakenly theretofore supposed to be species.

Surely any discovery that certain species supposed to be new ones are not really such, but only varieties, is no argument whatever in the way of proof that those other species, to the genera of which the former were for a time commonly supposed to be additions, are not true and real species. Is it not rather new, and often fancifully conceived and doubtfully hazarded ones, that are now found not to be such, and not old described species? Who can point to a species described by Pliny, and say that it is not a species now? His description describes it, and describes it as such, at the present day. The cuttle-fish has not yet risen to the rank of the elephant, nor advanced a single step towards it, but remains a cuttle-fish still, whose ink-

bag answers as well as it did in Pliny's time, or as it ever did before his time, the original purpose for which it was given to the creature, and the snake still crawls upon the earth and makes no endeavour, even if starving, to follow into the air the bird to whom nature gave wings to enable it to escape from any such enemy on the ground, but will die of starvation for want of food? But does any change of the kind spoken of take place, not only with the vast majority, but with any of the creatures that come under the notice of the naturalist? Do they not remain *in statu quo*? Is not the plover a plover all the world over? Does not the lion that roams over the sandy plains of Africa, or the tiger of the jungle of India, remain unchanged in close confinement in the gardens of the Zoological Society? Does not the wild canary of its native islands remain the same in an aviary here? Is not the pheasant of the mountains of Colchis the pheasant of the woods of England? Do not the bones of the sacred Ibis of 3,000 years ago tally with the bones of the Ibis of modern Egypt. Is not the scarabæus that the Egyptians idolatrously worshipped identical with the beetle (*ateuchus*) that crawls to this day over the sandy lands that border on the banks of the old Nile, which itself flowed in the days of Herodotus, as he supposed, from the snow that melted on the peaks of the mountains of the south, the very same, to all appearance, as it does now in the days of the telegraph and of steam, when the overland route makes a short cut to India, and the same as it will be while the whistle of the steam-engine sounds over the Isthmus of Suez, and its echoes die away over the waters of the Red Sea, so famous in the old world's history, as no doubt it is also destined to be in our own modern times?

There are two causes which are supposed by the theorists to operate in the subdivision of species, so to call them. First, an internal impulse, which by acting on some accidental advantages, compels a continued change in the state of the corporeal form which holds the spiritual essence, thus influencing its state —mind, in fact, acting upon matter—and, secondly, the opera-

tion of climatial influences which produce, though in a lesser degree it is said, similar or corresponding effects.

With regard to the first of these, we see indeed that earnest and concentrated energies of the mind and will, themselves called forth by the exigencies of bodily defects, do, to a certain extent, act upon the body, so as to produce and present for a time some changes of its powers for its own advantage. But these changes *are not permanent.* They not only are not handed down to descendants, (at all events it cannot be foretold that they will be,) but, more than this, they will even fail the individual who had acquired them, should an improvement in the bodily defects which had been the means of eliciting them cause them to be no longer demanded for the remedy of such defects by the substitution of an increase of other power.

Take, for example, the case of the blind, and I will mention several remarkable instances in illustration of the argument they suggest, and as they are very varied, I ask the patience of the audience while I give them at some little length—fewer would answer the purpose, or even one, but they are each and all so much *ad rem* that I am unwilling to curtail them.

Dr. Bell relates that a poor blind girl, residing in one of the provinces of France, had for many years, as her greatest comfort, perused an embossed Bible with her fingers. Getting out of health, and becoming partially paralysed, the hand also was affected, and gradually all power of touch was lost. Her agony of mind at the deprivation was great, and in a moment of despair she took up her Bible, bent down her head, and kissed the open leaf, by way, as she supposed, of a last farewell. In the act of doing so, to her great surprise and sudden joy, she felt the letters distinctly with her lips, 'and from that day,' he adds, 'this poor child has thus been reading in the word of God,' 'words more precious to her than silver or gold, even fine gold.'

Mademoiselle de Salignac was able to read by her fingers books in the ordinary type, if printed only on one side of the

leaf. Embossed printing was not then invented. She could also play at cards with perfect accuracy. Marks were made on each card, which, though they escaped both the eye and touch of those who had sight, she was able to distinguish. A blind German also was able to read books printed on rough paper.

Dr. Guillie gives an account of a blind Dutchman who could recognise the difference of the figures on cards, solely by their colour. He therefore won whenever he played, for he knew what cards he had given to his adversaries.

A blind Highland tailor, named Maguire, made tartan plaid dresses without mistake.

Dr. Sanderson and Madame Paradis could distinguish counterfeit medals from genuine ones, which even connoisseurs who could see were unable to do.

Mr. Dickens, in his 'American Notes,' says of Laura Bridgeman, who wrote in his presence, 'No line was indicated by any contrivance, but she wrote straight and freely.'

Diderot says of the celebrated blind man of Puesseaux, 'He appreciates with wonderful accuracy the weights of bodies and the capacities of vessels, and he has made of his arms balances so exact, and of his fingers compasses so well tested, that on occasion when this sort of static is called into play, I would always back our blind man against twenty who see.'

John Gough was able to recognise and classify different plants. 'Towards the end of his life a rare plant was put into his hands, which he very soon called by its name, observing that he had never met with more than one specimen of it, and that was fifty years before.'

Of a lady patient of Sir Hans Sloane, it is related, that she 'used to work much at her needle; and it is remarkable that her needlework was uncommonly neat and exact. She used also sometimes to write, and her writing was still more extraordinary than her needlework; it was executed with the same regularity and exactness; the character was very pretty; the lines were all even, and the letters placed at equal distances

from each other; but the most astonishing particular of all with respect to her writing was, that she could tell by some means when a letter had by some mistake been omitted, and would place it over the part of the word where it should have been inserted, with a caret under it.' It is related further of her, in the 'Encyclopædia Britannica,' that she could distinguish the different colours of silk and flowers. A lady who was nearly related to her having an apron on that was embroidered with silk of different colours, asked her, in the manner which has been described, if she could tell what colour it was; and after applying her fingers attentively to the figures of the embroidery she replied that it was red, blue, and green, which was true. The same lady having a pink-coloured ribbon on her head, and being willing still further to satisfy her curiosity and doubts, asked what colour that was. Her cousin, after feeling some time, answered that it was pink. Her answer was still more astonishing, because it showed not only a power of distinguishing different colours, but different kinds of the same colour; the ribbon was discovered not only to be red, but the red was discovered to be of the pale kind called pink.

John Metcalf, as stated in the 'National Review,' was born at Knaresborough in 1716. He lost his sight through small-pox when he was six years of age. At fifteen he was employed to dive for the bodies of two drowned men in the river Nidd, and succeeded in bringing one of them up. He also dived for, and brought up, two packs of yarn which were sunk in twenty-one feet of water. He rode and won a race, on his own horse, and enlisting in 1745, in Thornton's troop, fought at Culloden and elsewhere. He afterwards acted as a guide to belated travellers, and drove a stage-waggon between York and Knaresborough. After studying mensuration and engineering, 'we soon find him engaged,' writes Dr. Ball, from whom, says the 'Review,' we have abridged the foregoing statement, 'as a projector and surveyor of roads and bridges. Amongst other works he built Boroughbridge, and made the roads through Yorkshire, Lanca-

shire, Derbyshire, and Cheshire.' Dr. Bew, the intimate friend of Dr. Moyser, was well acquainted with Metcalf, and thus speaks of him:—'With the assistance only of a long staff I have several times seen this man travelling the roads, ascending precipices, exploring valleys, and investigating their several extents, forms, and situations, so as to further his projects in the best manner. . . . . Most of the roads over the Peak in Derbyshire have been altered by his directions, particularly those in the vicinity of Buxton. . . . . I afterwards made some inquiries respecting a new road he was making. It was really astonishing to hear with what accuracy he described the courses, and the nature of the soils through which it was conducted. Having mentioned a boggy piece of ground it passed through, he observed that it was the only place he had doubts about, and that he was apprehensive they had, contrary to his directions, been too sparing of their materials. This extraordinary man lived to the advanced age of eighty-five, possessed of his mental faculties to the last, and died in 1802.'

Dr. Sanderson, by the reverberation of his steps, could judge with wonderful accuracy as to the character of objects from five to twenty yards distance. Thus he was enabled to distinguish a tree from a post at the distance of five yards, a fence from a house at fifteen or twenty yards. The sound of his foot-fall in a room enabled him to judge of the dimensions and character of the apartment. Having once crossed a threshold, so distinct was his individualisation of every locality, that he would at once have known it again, even after the lapse of many years.

Dr. Moyser had the same faculty. 'A person,' says Dr. Kitto, 'who knew him related that whenever he entered a room he remained for some time silent. The sound directed his judgment as to the dimensions of the room, and the different voices and number of persons in it. His distinctions in these respects were very accurate, and his memory so retentive that he was seldom mistaken.'

'A young blind man told me one day,' says M. Dufau, 'that in his walks . . . . he at once perceived a wall, a hedge, a

mountain, any obstacle, in short, which might be before him; "When I find myself in a vast plain," he added, raising his hand to his ear with a very expressive gesture, "it seems to me that I am *à perte d'ouïe*." This remarkable expression, imitated from our *à perte de vue*, in an analogous situation, enlightened me much as to the importance of this sense to the blind.'

By means of a light cry or a gentle tap with the foot at the entrance of an apartment, the blind are able to tell whether any one is present in it or not, its extent, the nature of and any alteration in the furniture. 'There is now living in the city of York,' says Mr. Johns, 'a gentleman of fortune who though totally blind is an expert archer, so expert,' says our informant, who knows him well, 'that out of twenty shots with the long bow he was far my superior. His sense of hearing was so keen that when a boy behind a target rang a bell, the blind archer knew precisely how to aim the shaft.'

Diderot tells a tale of the blind man of Puesseaux, who, in anger at one of his brothers, occasioned by some boyish dispute, threw a stone with such exact aim, that it struck him in the middle of the forehead and levelled him with the ground.

M. Rodenback relates that at a soirée in Brussels, a blind man succeeded in stating with precision, according to their voices, the age of all the persons present. *His only mistakes were with regard to some ladies, who were not displeased at his inexactitude!* The ability which the blind possess of recognising a voice once heard after an interval of years, in spite of attempted disguise, is as well-attested as any of their peculiar powers.

Of Simon Moyser, Dufau relates as follows:—'He was born among the Alps of Tyrol, and lost his sight at two years of age; he devoted himself to so patient an exploration of the surrounding mountain-tops, that he was soon capable of directing thither the steps of all those who visited them. Carried away by a sort of passion for travelling, he pushed his excursions further and further, betook himself to Gratz, and became a messenger,

carrying letters and money in these mountainous countries, in which scarcely any other method of communication is possible. In 1818, when he was thirty-three years of age, he perished in a torrent in which several seeing persons had lost their lives before him.'

Dr. Bull relates, on the authority of a friend:—'Visiting, in 1847, some friends in Gloucestershire, one morning, a man about twenty-five, perfectly blind, for the eyesight was entirely gone, called to return thanks for his admission into a blind asylum in which he had been residing for some years past. In giving an account of what he had learnt there, he mentioned the power of distinguishing colours by the touch, and begged those present to try him. I made him feel my dress, a French merino, and he replied, "I should say this is a reddish-brown," which it was. The next given him was one of the Rob-Roy tartan; he said, "This is a material of two colours, red and black." Another person made him feel her blue gauze veil, "This is blue, but a very thin dress for the time of year," was the reply. Being asked how he attained this power, he replied, "A piece of cloth was given me and its colour named, which I felt till quite familiar with it; then another, which I continued to examine until I could distinguish the one from the other; and so on till I knew all the colours;" and as it seemed to us, even shades of some. The darkest colours appeared to him to have most body in them. He said it required a very sensitive touch, and great patience and perseverance, and that consequently very few attained the power.'

Now here we have a series of adaptations to circumstances, and a capacity for improving the condition in which the individual or, we may say, in ordinary speech, the class, had been before; we have a positive acquirement, and this in the highest of all species, of new faculties, or at all events such an improvement on any that had previously been possessed, as to render them as good as new, and this to such a degree as to place these cases, the results being obtained in a part only of one short life,

at least on a par with those advances of one species from a lower grade (so supposed), to which the theorists are obliged to assign a slow gradation through periods of countless ages. These acquired powers, of which I have given such remarkable instances, were not mental but corporeal, and though the changes in condition which originate such are not visible to our outward sight, they are none the less real.

But as I have said, these acquired powers *are not permanent!* They only serve the occasion! They are not handed down to the children of those who had acquired them! They perform no part in the production of a new species which shall hereditarily possess them! The species remains unaltered, and, I believe, unalterable.

Besides, so far from requiring countless ages to call them forth, they have been, I say, one and all acquired in a single portion, and that a short one, of the single life of each single individual who possessed them.

Mr. Darwin, as already said, contends that it is by the retention, by the power of what he calls Natural Selection, of some accidental advantages, such as superior strength, or other, that a fresh species is formed. But how can this possibly apply to the case of the vast majority of species, insects and others, whose specific differences are only distinguishable by their colours or marks? Is a swallow more powerful than a martin, or a robin than a wheatear, a thrush than a blackbird, or a nightingale than a redstart? There are comparatively but few gradations in the relative strength of butterflies, moths, and other insects. Do the vast majority vary from their fellows in anything but shape or marking? Many, I say, of the varieties that occur, varieties existing, and existing in perpetuity, in some, but in some only, of the different members of one common brood of one and the same pair of parents, are they not mere varieties of colour and arrangement; varieties which, on no conceivable ground can we imagine to have any influence whatever as to an increase of happiness, or to an increased aid to life, on the

individual possessing them. The variety of the moth or butterfly which we see loses its fine down almost immediately after its birth, and flies about soon with tattered or even torn wings, without much, if any, remaining trace of the variation we once admired in it, but still living as happily and as well as it did before. How then will the theorists separate this class of cases from those whose changes of outward condition take place, from the supposed use and behoof of the animals experiencing them? Where will they draw the line? And if they attribute advantageous alterations to the power of Natural Selection, to what cause will they assign these which can, as I have shown, be on no conceivable ground thought to be for the actual benefit of one member or a few members of one and the same brood, the rest of the members of which are without them? It would be a curious question, and one well worthy of solution by experiment, whether these permanent varieties are ever produced from examples of the permanent variety, or only and always from examples of the parent stock from which they have derived their general character, together with the turn to their peculiar form.

Again, does the law of strength prevail in the vegetable as well as in the animal creation? And if so, how is it that the grass and the thousand flowers of the field have not been supplanted by the elm and the oak and all the other trees of the wood? Has not the vitality of seeds something to do with the question? 'In what,' in the words of Professor Owen, 'have these mechanical instruments, the hands of the ape, the hoofs of the horse, the fins of the whale, the trowels of the mole, the wings of the bat, so variously formed to obey the behests of volition in denizens of different elements—in what, I say, have they differed from the artificial instruments which we ourselves plan with foresight and calculation for analogous uses, save in their greater complexity, in their perfection, and in the unity and simplicity of the elements which are modified to constitute these several locomotive organs.'

The next following questions are suggested by the unanswerable work of another able writer, Mr. Bree.

If the strongest creatures were ordained to prevail over the weaker by a law of nature, in the struggle for existence, how is it that the Pterodactyle, the Dinotherium, the Apteryx, the Megalosaurus, the Plesiosaurus, the great cave bear, the fossil hyæna, the mammoth, and others have perished from off the face of the earth, while the hare, the rabbit, the sheep, and the mouse flourish and abound?

If the ant, the beetle, the butterfly, the dragonfly, the housefly, each with its eye of 25,000, 17,000, 12,000 or 4,000 lenses, lives only a few hours, days or weeks, within what space of time could this wonderful organ have been produced by a process of Natural Selection? How could the insect have existed at all without it, if in its present otherwise perfect state? or did it acquire this and its other perfections simultaneously *per saltum*?

If there was only one species of living creature at first, what what was the origin, the use, and intention of the diversity of plants, &c., which now are made use of for food by the various animals; and who prepared them, in the absence of species, for the use of species? What was the object of their creation? or did they, too, branch off one by one from some parent stem to suit conveniently the appetites of the species increased from time to time by the operation of Natural Selection?

If, as Mr. Darwin argues, man in an advanced state of civilisation lived in Egypt 13,000 or 14,000 years ago and uncivilised man for an indefinite period before that time, on what basis of fact does he ground his theory that in a few thousand years the present race of men will have become altered in form?

How was the difference in the blood corpuscle in the various genera of animals produced by Natural Selection?

How did Natural Selection produce lungs by variation in those lower species in the scale of creation in which there is no trace whatever of any such organ?

If use produces by Natural Selection, and disuse does away

with an organ, how is it that domestic poultry still retain their wings?

Is the eye of the butterfly composed of 17,000 lenses less perfect or less perfectly adapted to the use of its possessor, than the eye of man so much higher in the scale of creation is to him?

Is not the eye of any creature, even the lowest in the scale of creation, perfect in itself, and adapted expressly to its state of life?

If Natural Selection can only be supposed to act for the good of the creature, how is it that so many of Mr. Darwin's instances of supposed transmutation are of a downward nature in the scale of creation?

As the flying lemur, the flying squirrel, and the flying fish, do not, properly speaking, fly at all, how can they be instanced as proofs of transitional existences between flying creatures and those that do not fly?

By what act of Natural Selection was the pouch of the camel formed?

If the differences of structure between man and apes are so insurmountable, as Professor Owen has shown them to be, must they not be proportionably greater between man and reptiles, birds, fishes, &c.

As the condition of the world is constantly varying, should not variations of species be seen taking place in these times as in all others, with definite regularity if the first primordial form contained within itself the elements of perpetual change for adaptation to such varying condition?

Is the use of such expressions as 'Natural Selection,' 'modification of form,' 'acclimatisation,' 'use and disuse,' 'the law of variation,' 'divergence of character,' 'correlation of growth,' 'compensation,' and 'economy of growth,' or, 'the *imperfection* of the geological record!!' a sufficient substitute for proof of the assertions that a flying fish might be converted into a bird! a flying squirrel into a bat!! a lobster into an eagle!!! or a

bear 'swimming about with its mouth open to catch flies'! become in process of time 'very like a whale!'

Is not every variety of pigeon a pigeon still, and nothing else? every variety of horse, to all intents and purposes a horse? every variety of ox, an ox? every variety of dog, a dog? Will not a good naturalist always be able to recognise, by instinct as it were, the species in the variety? Does not every variety even of dog exhibit incontestably the same general characters?

Are there any traces of an animated world prior to the Silurian epoch, before which the advocates of the new theory are obliged to assume billions of years to account for the present number of species?

By what process of Natural Selection were the different instincts of the 500,000 species of insects and other creatures in the world produced?

By what power of Natural Selection was the principle of resistance to disease and repair of accidents in each kind of animal acquired? What bargain did such accidents make with time?

What has Natural Selection to do with the building by each different species of bird of a different kind of nest? the domed nest of the long-tailed titmouse for instance? Do birds' nests show any signs or symptoms of correction or improvement by Natural Selection?

If it be the rule of nature 'let the strongest live and the weakest perish,' how is it that the weakest creatures are so much more numerous than the strongest in this age of the world?—that deer are more numerous than lions, and pigeons than hawks, and that the lowest and most helpless of all forms, the animalculæ of the drops of water, are inconceivably more numerous than all the stronger creatures put together?

How are the electric organs in fishes accounted for by Natural Selection?

How can fertile ants determine by Natural Selection to produce a neuter progeny, inasmuch as though such are advantageous to their community, they can be the object of no desire for the

benefit of their own individual kind on the part of the producers?

Is there any truth in the statement that all domestic animals have, in some country or other, drooping ears, and that in consequence of disuse of the muscles of the ear from the animals not being much alarmed by danger? Why should they be more alarmed in one country than in another in like circumstances? Is it true of the horse? Is it not the case with the hare in the wild state?

If it be to be supposed that, judging from the past, we may infer safely that not one living species will transmit its unaltered likeness to a distant posterity, 'is it not inexplicable that there should be no record, either during the historic period, or in the ages since the so-called Silurian epoch, of a single species in the transition state?—of one that will evolve a new species?—of one that has not in it the elements of *reversion to its previous state* from any temporarily acquired change of form or habit?'

Do the remains of the mammoth, the mastodon, or other kindred animals testify to a gradual successive development to a higher, or a degeneration to a lower, form?

Are not the variations of form, size, and colour, in pigeons and other domestic birds, the result of high feeding and unnatural circumstances, as with plants transplanted into a new and richer soil, where they become extremely variable?

If these variations are the effects of a *natural* law, why do they not take place equally with birds or plants in a *state of nature*?

Are not artificial varieties merely exceptional, and as nothing, in comparison with the numbers of well-defined species?

Are there any records of there ever having been varieties of birds in a wild state similar to those produced when under artificial treatment? Is it anything surprising that the progeny of wild animals kept in confinement should not be always of the normal form?

'In the number of cases,' asks Mr. Bree, 'in which parts of

importance physiologically vary in individuals of the same species, what are these cases in comparison to the vast bulk of normal forms? And again, are not these deviations, in almost every case, degradations from the natural standard of structure, and are they not frequently produced by an altered and unnatural mode of life?'

Is there any proof that there is a natural law, by which one species becomes ultimately changed into another, even though it be admitted that structure will vary and acquired peculiarities be continued for a longer or shorter succession?

Was the supposed primordial form at once both male and female? or if not, how were its progeny produced? How long did it exist without issue? Did it produce both male and female?

If it survived so long, how came it to require to make a Natural Selection in order to better the condition which had enabled it to exist till then?

How could it at one and the same time be in its normal condition, and have some new advantage to avail itself of?

Was its Natural Selection a mental or a corporeal effort of power? If mental, whence was it obtained?

Was the creature of an animal or a vegetable nature?

If, in the struggle for existence, 'one new-formed species only gains the day, to be in turn overtopped by some newer forms,' *cui bono*? and how is it, I again ask, that the variety of lower forms still exist, some of them in countless myriads, and keep their places as well as ever?

I repeat, if the suggestion of the modern theorists were correct, that it is by Natural Selection that accidental advantages have been preserved to the posterity of each successive creature, is it not reasonable to suppose that the higher in the scale of creation (if they will, for the sake of argument, allow the expression) the animal is, the more likely is it that its longings should issue in the production of the effect it desired? Is it not likely, *a priori*, that such power of retention would be

stronger and more effective in a higher than in a lower form? But nothing of the sort do we see to be the case. Even in man, the highest, as all will allow, his strongest wishes even in his best estate are vain—his most ardent aspirations utterly without effect; 'Which of you, by taking thought, can add one cubit unto his stature?' Can the short man, who wishes to be tall, stretch himself by his wishes even to the middle height? Can the Yorkshire giant reduce himself to the level of the dwarf, or even meet him half-way? Can the blind man I have spoken of secure to his posterity the niceness of touch which his want of sight has led him to acquire? or the deaf man the similar acuteness which he has acquired, and made as it were natural to himself? Can the lean man gain an ounce by all the wishing in the world? Will not rather the straining of his mind in that direction produce even a contrary effect, and leave him leaner than he was before? Can the stout man rid himself of the mountain of flesh which is a burden to him to bear about? Can the Ethiopian change his skin? Can the frog assume the dimensions of the ox? Will he not, as Æsop has long since told us, burst in the vain attempt, even though he should be a larger bull-frog than ever came from a tadpole before?

"There are many advantages in strength, but can the strong man ensure the transmission of strength to his family, or to his sons, or the mother to her daughters? Can the handsome man ensure a perpetuity of beauty in his descendants, or the tall man a continuance of height? Yet these natural advantages, so often possessed, and which every one would naturally wish, if he could, to transmit to his posterity, can any amount of wishing, any action of mind or body, in the way of Natural Selection, convey the possession of a single particle or jot of? They are accidental varieties, of a kindred nature with those which happen to other species, and most certainly have no tendency to the production of permanent distinct races, whose invariable possession of the like shall entitle them to be classed with real species. Nay, even as varieties they are by no means

necessarily transmissible. Yet man is the highest creature. He at all events can *will*, and if in any creature the desire to benefit his offspring by his Natural Selection of personal advantages to be transmitted to them should be looked for, should it not be found, and would it not be found in him?

How then can plainness succeed beauty, or weakness strength, shortness height, or slightness size, dullness talent, or vice virtue?

There is a further objection which may be here considered. With regard to any internal impulse which, by acting on some accidental advantages, compels a continued change in the corporeal form, though it be granted, as I have said, that earnest and concentrated wishes of the mind—themselves called forth by the exigencies of bodily defects—do to a certain extent act upon the body so as to produce some changes of its power for its own advantage, yet is it not the fact that these changes are not only not permanent or not handed down, at all events not necessarily or invariably, to descendants, but, on the contrary, will even fail the individual himself should an improvement in the bodily defects which had been the means of eliciting them cause them no longer to be required for the remedy of such defects by the substitution of an increase of other powers? But, on the other hand, are not some personal defects, not only trifling individual peculiarities, but even defects of the gravest character, continued occasionally through many generations — such as blindness, deafness, and above all insanity, all of them more or less temporarily hereditary, and that throughout the world, none of which individual specific differences, so for the moment to call them, can have been the result of any desire on the part of those in whom they have originated that they should attach either to themselves or for their descendants? Yet do not we find them more or less for a time perpetuated, while the species remain the same as before, no new species or *quasi* species being formed or supposed by any naturalists to be formed thereby? And are not these diversities quite as great as or much greater than these graduated

distinctions, the existence of which in various kinds is thought to give a handle to the argument that because they do not in these give sufficient ground for their separation into true species, so other differences not greater in actual amount do not either?

I say, if this supposed power of Natural Selection is so potent in the permanent acquirement of what were occasional and chance adaptations to trifling wants or requirements, how is it that it is not equally available for the getting rid of injuries whose effect is already felt? How is it that the blind man, who hears the remarks of those about him and longs for the faculty of sight, which he is unblessed with the possession of, does not obtain it by the force of his longings? If the universal tendency of nature is to raise the condition of each individual race by their own inherent power, whence have come the failings, retrogressions, and deficiencies we see, and why are they not correspondingly repaired? They cannot have sprung of the creature's own desires. No creature has a natural innate wish to injure itself and lower and deteriorate its own condition or that of its race. No one who has ever heard the voice of friends and listened to the soothing influence of music would ever desire to be deaf. No one who has looked upon the light but would say that 'truly a blessed thing it is to see the sun.' No one who has beheld the glad face of nature would strain his eyeballs in search of blindness. No sane person but shrinks with horror from any morbid giving-way to the melancholy which would act as a prelude to madness. What then, on the principle urged, is the origin of the bodily defects of blindness and deafness, and others that we see around us?

Many such bodily disadvantages are to some extent hereditary, and those who are affiicted with them wish their removal. But can they in any generation remove them? Have any ever succeeded in doing so? Yet if volition can avail to make a gain of a chance advantage, why can it not avail to do away with an accidental disadvantage? If then, I may here ask again, if the energy supposed to act in the alteration and adaptation of forms is expended in an endeavour after an improved *status*, to what

impulse are we to assign the retrogressions and degradations that we see so many unfortunate examples of in our hospitals and asylums; and these not accidental and isolated, but often, though not always nor necessarily, more or less hereditary? If changes for the better are the fruit of an inward wishing power in the creature acting on bodily conditions, what is the source and cause of changes for the worse, and why are they not cured by internal effort?

For the doctrine of Natural Selection necessarily supposes the existence of some innate mental power able to act *per se*, previous to and independent of any outward circumstances which may affect the body. In fact, the very word 'selection' expresses an action and choice of the *will* entirely distinct from the corporeal element. If, then, this power can avail to the securing to the creature the perpetuity of any change of form or condition that it may somehow or other have acquired, I ask again, how can it be denied but that it should have equal power even over its ordinary condition? For the change in the character of its race would be no greater in the one case than in the other. But is there the faintest indication in the history of mankind that any such result has ever taken place in any of the race as that the wish should be the parent of a palpable, tangible, and perpetual bodily result? There is not. Dædalus would, no doubt, have spread out natural pinions if wishing could have done it; but his great-grandchildren remained as unfledged after him as did his great-grandfather before him. He went as far as he could go in making artificial wings, and we all know with what result. There assuredly is no historical evidence that a single feather ever grew on his shoulders, nor did his winged thought produce even the embryo of a shaft of one in any of his descendants. He lived and died a *bipes implume*. It remained the same with those who came after as it had been with those who had gone before him.

It is supposed that when variations occur in this or that species in the course of thousands of generations, many more individuals being born, as all know, than survive, those

individuals which happen to have some advantages in variation, however slight, over others, are those which have the best chance of surviving and of preserving their kind. But, in the first place, are not the causes—such as those of an atmospheric character, or some others utterly beyond our knowledge or senses—that sweep off the vast numbers of individuals of the different kinds not such as will be successfully appealed to by those individuals who may happen to differ from their fellows in some trifling variation which might perhaps stand them in stead, if, indeed, a 'struggle for existence' had to be maintained hand to hand against each other: is it not, doubtless, some advantage of a very different kind and entirely outside themselves, such as the being placed in a more favourable locality, or the being born later or earlier, that gives the superiority to those who in consequence survive.

We see all this in the case of fruit trees and flowers, and doubtless, so it is likewise with all animals. Then, again, even supposing that such advantages would give to the individual possessing them the best chance of perpetuating its race, and these advantages together with it, are we to suppose that one parent will be able of itself to transmit them? And if so, which parent? Or must we assume that both parents at one and the same time by some happy conjuncture, or lucky accident, are possessed of this improved condition, and both are able to transmit it to their offspring? Or do many pairs of parents happen to be gifted with the like advantages at one and the same time? *Deus pascit corvos.* The fowls of the air and the fishes of the sea have no care for the morrow. 'They sow not, neither do they reap,' but without anxious care or thought seek each day for the food of the day, and find it.

Can we suppose for a moment that beyond the instinctive feeling which has always set at naught, and always will set at nought, the vain and abortive theories of Malthus and Miss Martineau, they have a single thought about the preservation of their kind, or that they trouble themselves with calculations as to how many eggs of the codfish or of the salmon will come

to maturity, or, if they should, will survive that epoch of life? their struggle for existence is present and not prospective; they have no desire to rise in the scale of creation. Has the mind that is in man and which—if the theorist's views were correct—must have been inherited from them, (if not, from whence else on their showing is it derived?) any such action upon their limited faculties as it has in his?

Is it not asking too much of our reason to request us to believe that all these varieties, or supposed varieties, of species are produced by the modification of external conditions in the productive power of the parent? for is not this incompatible with the notion the same theorists entertain that it is a feeling of self-interest that promotes the change into each new kind? But here the parent can derive no benefit itself, but must be supposed to exercise its aspirations in favour of a superior condition of its future offspring over its own present state. In other words, unless we admit that this supposed process of natural selection is carried on for the benefit of the life of the animal that practises it, can we come to any other conclusion than that, if it issue in adaptation and improvement at all, it must be only and solely for that of its posterity; and must we be asked to believe this of forms the very lowest of the low, for to them we must step by step go back, removing the gradual accumulations of each successive age in any analytical investigation. Is not the doctrine of a direct Providence more reasonable than that of the theorist who admits that 'some domestic animals vary less than others,' than the one he arrives at; namely, that the rarity or absence of distinct breeds of the cat, the donkey, the peacock, the goose, &c., may be attributed in main part to selection 'not having been brought into play!' in cats, from the 'difficulty of pairing them!!' in donkeys, 'from only a few being kept by poor people, and little attention paid to their breeding!!!' in peacocks, from their 'not being very easily reared and a large stock not kept !!!' in geese,—*risum teneatis*?—from 'being valuable only for two purposes, food and feathers, and more especially from no pleasure having been felt in the display of

distinct breeds!!!' Again, if it were the case that all the different modications of so-called apparent species were the results of internal impulses in the several creatures acting on occasional adavantages, every variation we see should have, one would think, to be attributed to a similar cause. But what are we to say to any monstrosities, or *lusus naturæ*, which cannot be supposed to have so originated, such as for a person to have a complete sixth finger, or, like the Giant of Gath in olden times I elsewhere allude to, who had on every hand six fingers and on every foot six toes? How are we to account for the production of such a monstrosity in its perfect state? How could it have originated in the way supposed, when the idea or thought of the possibility of such a thing must have been totally new and unprecedented?

And here I must make another inquiry which cannot but suggest itself to every one who has been in the habit of collecting specimens of Natural History. We see, for instance, in the case of various moths both what are called permanent and accidental varieties. With regard to these, two things occur to our observation; first, that one or more of these will be met with, together with others of the ordinary type, in the same brood that is produced from one and the same cluster of eggs laid by one and the same individual moth. Now, if one of these variations from the original forms has been produced, or on its casual occurrence been caused by the aspirations of some one parent after an improved form or state of existence, which it felt to be more suitable to itself or its posterity than that in which it found its race or itself placed by nature, how is it to be accounted for that when once the difficulty of the acquisition has been got over, all of its immediate, or at all events of its succeeding descendants, are not in each generation one and all alike gifted with the power of retention of it? Why and how does the original form still prevail in the minority or majority? Why and how in any kind is the new-fashioned one still an exception? Moreover, when we see these various members of one and the same brood, the type and the variety, living

together in the same spot, thriving equally well on the same food, acting in every respect in the same way, exercising the same habits, with the like continuation of form, and alike without further change, we are irresistibly led to ask whether some want felt *can* have been the cause of securing the variety, and if so, what is the reason that the like capacity for change has not existed in each individual of the kind in every age? Why, if it was beneficial, it has not been shared by the whole brood? why, if not beneficial, it was produced by an impulse whose sole office is supposed to be the production of beneficial results? We not unoften see a larger caterpillar than ordinary of the same brood, all or most of which are not so large. But what of that? If the butterfly or the moth that is produced from it is comparatively larger, no race equally large is produced in perpetuity. I have a specimen of *Colias Electra* which measures nearly two inches and three-quarters across the wings, but it is the only such one I have ever seen or heard of. There is no such large race; all others are of the ordinary magnitude.

Is the difficulty of supposing the creation of man, or a tree, or any other creature, to have been exhibited each at once at its full growth, any greater than or so great as that which would arise from supposing them to have gradually grown from the smallest beginnings? For whence had these then their origin? How could there be a child without a parent? a seed without a full grown tree? an egg without a full-fledged bird to lay it?

Mr. Darwin remarks that no terrestrial animal can be transported across a wide space of sea, but that bats can fly across, and stating that Norfolk Island, the Mauritius, &c., all possess their peculiar bats, he asks, 'Why has the supposed creative force produced bats and no other animals on remote islands?' But why does he omit to explain what renders it more difficult for a bat to fly from an island to the mainland than from the mainland to an island, so as not to be peculiar to the latter? The American species *V. pruinosus* and *V. noctivagans* have been found in the Bermudas, the former annually for a few months,

a distance of 600 or 800 miles from the mainland. It has also occurred on South Ronaldshay, one of the Orkneys, in 1847.

Mr. Darwin says, that insects confined to sea coasts are often brassy or lurid. But are they always so? and are not many that are confined to, or found also in the inland, equally brassy and lurid? Where is there a more highly-coloured or resplendent insect than *Agonum sex-punctatum*? Where a more dull one than *Byrrhus pilula*? or is the maritime *Cicindela Germanica* more bright than, or so bright as, the allied inland *Cicindela campestris*? Is it not much duller?

Stress has been laid on the fact that the osteology of some species alters together with other outward changes of form induced by domestication, as is the case, for instance, with the varieties in the form of the heads of the different kinds of tame pigeons. But such changes prove nothing at all; for is not the difference in the shape of the heads of the different races of men, the Mongolian, the Caucasian, the Malayan, the Ethiopian, and the American—not to mention the still greater variety into which some systematists have divided the human species—quite as great as if not greater than any of these? and may not still greater differences than any of such mere permanent varieties of form be seen in half an hour's walk through the streets of London? No two faces, no two features of any face, are, or probably ever have been, exactly alike: and so, neither is there a similarity of form in the other portions of the human head, *Quot homines tot sententiæ*, and phrenologists tell us that the external form of the skull is affected by the working of the brain within. Yet man remains but one.

On the subject of reversion, the following remark of Mr. Darwin's occurs: 'Having alluded to the subject of reversion, I may here refer to a statement often made by naturalists, namely, that our domestic varieties, when run wild, gradually but certainly revert in character to their aboriginal stocks. Hence it has been argued that no deductions can be drawn from domestic races to species in a state of nature. I have in vain endeavoured to discover on what decisive facts the above statement

has so often and so boldly been made. There would be great difficulty in proving its truth.' But in the case of plants, is there not a homely instance at hand in every garden in disproof of his assertion? There are few plants more disposed to variety than the pansy, and yet we all know how difficult it is to maintain the varieties in their various cultivated states of excellence. Let the finest variety self-sow itself for a very few years, and it returns to the humble wild flower that vegetates in the uncultivated country. Nay, as every one who has a flower-garden knows, is not the difficulty with many flowers to keep up any acquired excellence while under cultivation, and to prevent a retrogression, to what, in the eyes of cultivators, is an inferior state? But in fact, on the very next page after that on which the above-mentioned paragraph occurs, it is admitted by himself, that 'when under nature, the conditions of life do change, variations and reversions of character probably do occur.'

Then, next, the same writer propounds the following:—'I can see no good reason to doubt that female birds by selecting during thousands of generations the most melodious or beautiful males according to their standard of beauty might produce a marked effect. I strongly suspect that some well-known laws with respect to the plumage of male and female birds, in comparison with the plumage of the young, can be explained on the view of plumage having been chiefly modified by selection, acting when the birds have come to the breeding age or during the breeding season, the modifications thus produced being inherited at corresponding ages or seasons either by the males alone or by the males and females.'

But is not the analogy the other way? for in the very highest of all species—namely, in man—the possession of beauty belongs as the rule, we shall none of us members of the British Association be so ungallant as to deny, to the female sex. When then, why, and how did the divergence in favour of the possession of beauty by one sex instead of the other branch off in these two opposite directions? We may indeed admire as naturalists the neatness of plumage in the females of some species, but must

we not admit as a matter of fact that in birds and insects the males, so far as I know, are always, or for the most part, more brightly plumaged and coloured than the females?

Moreover, in the case given of birds, the males are not only endowed, perhaps exclusively, with superior beauty of garb, but also with the gift of song. Is this also to be attributed to a like sense on their part of the admiration of the females of their vocal powers? Did the females ever possess the like? If so, how came they so universally to lose them? for it is a disputed point whether any female birds ever truly sing? How came this to be the case with several thousands of kinds?

Then, after the observation that continental productions have everywhere become largely naturalised on islands, it is remarked that 'on a small island the race for life will have been less severe, and there will have been less modification and less extermination.' But should not the contrary rather be thought to be the case? and certainly as to man, is not the 'battle of life' most strenuous within any such contracted space?

Again, it is asserted in the work I have referred to that any change in the embryo or larva will almost certainly entail changes in the mature animal. But is not the exact contrary the truth of the case? Are not the caterpillars of many species of insects extremely variable, not only in their several stages of growth, but in each or some of these respectively, and is not this without any corresponding change in the perfect insect, which retains its usual character?

Once more, he argues, I really hardly know what, from the fact that in Madeira there are many beetles which have no wings under their wing-sheath, as if, by their being thus kept on the ground, to prevent the danger they would incur of being blown out to sea if they were to indulge in flight. But he does not say that all the beetles of Madeira are wingless, he allows that nearly two-thirds of them are not; and he altogether forgets or ignores the fact that our own coasts abound with beetles which have wings. Yet must there not be precisely the same

danger here of their being carried out to sea when the wind blows off the land, and the same with those of any other island or mainland, as there is or can be with those of Madeira?

And yet once more. The writer referred to states that it has been asserted that shells are brighter at their southern limit and when living in shallow water than those of the same species further north or found in greater depths, and that it is believed that birds of the same species are more brightly coloured under a clear atmosphere than when living on islands or near the coast. Are there, then, no deep seas washing against the quiet sides of the coral islands of the south, or no shallow ones where the stormy waves of the northern seas have worn away during long ages the hoary and weather-beaten cliffs, and left no part of them remaining but their ancient foundations, themselves in turn protecting and protected by the flat sands on which, miles from high water-mark, the homeward-bound vessel is wrecked, after safely completing up to that point a long and prosperous voyage? But do our shells vary in colour in our waters of different depths? or do those of southern waters either in theirs? Tropical productions are indeed bright; but is the knowledge that they are so anything new, or are they brighter or less bright than they were? And as to birds, do we not see them every year winging their way from south to north to build and breed? but does their plumage assume or show the slightest tendency to assume a brighter or duller hue as they range in one direction or another, or rather is it not universally the case that in the north as well as in the south the gayest plumage is gained at the season when the bird makes love? Plumage, which is gained long before the summer sun has arrived at its height, is lost again when the family is reared in the sultry season, and is not regained till it revisits its native country, though it has left in the interval our colder climate for the blazing heats of Africa.

If progression has been the order of the day ever since the beginning of the world, if, indeed, we may be allowed to suppose that the world ever had a beginning, how is it that the serpent

still grovels on the earth? And why does the pterodactyle no longer hover about our heads? Or are we to believe that the latter has long since been merged in some higher form? Is not the doctrine of the transmigration of souls quite as rational as that of the transmigration or transformation of bodies?

There are a vast number of varieties in the different species of animals. Is it not for the theorists to tell us which of these varieties are attributable to these supposed impulses in the animals themselves, and which to causes or a cause extraneous to them? Should it not likewise be explained why some are not so fortunate as to be opportunely able to avail themselves of favourable circumstances, but either have none such thrown in their way, or perish in the abortive attempt to avail themselves of them? For it cannot be supposed but that if an advantage of the kind imagined be such to an individual or to individuals, it must be so to the whole of the species at the same time; and ought we not also to be told whether all this, the good fortune of some kinds or of some individuals and the bad fortune of others, is to be attributed to blind chance, or to the wayward caprice of some power unknown, and not to the GOD in whom all Christians believe? The GOD of order, the GOD of beneficence, the great Architect of the universe and of all its countless creations, as well of immeasurable magnitude as of inconceivable minuteness.

Now, if there be supposed to exist in any creature the instinct to avail itself of any gift or acquired advantage for its own use and that of its progeny, the possession of it cannot have come to it from the clouds, but must itself have been inherited by it together with its animal life, so that we are irresistibly driven to the conclusion that each new species, so, for argument's sake to call it, must have received this impulse one after another, and therefore as we go backward and backward we shall find that it must have existed in full force in the lowest forms, the frog, the lizard, the fly, and even in the very zoophyte.

Besides, is it not impossible to stop even at the beginning of

animal life, supposing that we could arrive at it and should find it true that the whole of animated nature had its rise in some one form—the lowest of the low? There are other inanimate forms of vast diversity likewise. Had these, too, their origin in some one *rudis indigestaque moles*, from which they have scintillated and been struck off in the course of those long and tedious ages? By what act of volition did the garnet, the sapphire, the ruby, and the amethyst, not to say the diamond, fashion themselves into new variations of species? How and by what process of Natural Selection were the marble, the granite, and the ironstone produced? And from what the primæval rock?

Supposing, however, for the sake of argument, that all living creatures had their original in some one kind—which supposition, if either of the two were to be entertained, is scarcely so irrational as the notion that they should all have sprung from some dozen or half dozen kinds—this creature could have had at its first existence no acquired improvement on its own state: it could not at one and the same time have had a primordial condition and an improved condition to transmit to its progeny, so that the question is, from whence could it have acquired any improvement, which if it had, having also at the same time the instinct to make use of such for further improvement by its descendants, it would then leave to them as an inheritance? The immediate ancestor of these had it not. Whence then came it to them? But, on the other hand, supposing they had it from their first parent or parents, how was it that they did not all have it? Why and how were any left without inherited advantages which those of the same birth had not? Or if there was only one offspring of the parent, how came there to be more than one new improved species? How could there ever be more than one species, improved or not, after the death of the previous one.

Moreover, if a variation, as being profitable to the individual of any species which has happened to possess it, is necessarily handed down to its descendants, which is what the theory

supposes, is it not easy to imagine that from a change of circumstances, or a reversion to those which had existed in the previous case, the continuance of the variety would be a disadvantage rather than an advantage, and the Natural Selection of it would tend so far to the extinction of an old species rather than to the production of a new one?

It is clear that the supposed original tendencies within animals to self-adaptation to surrounding circumstances must have been, if existing, in lower forms desiring improvement, and not in higher ones desiring degradation; but many of Darwin's instances are of the latter class, and is it not monstrous to suppose such a thing, for this would degrade the highest present form to the lowest possible in its beginning, and what is this but to abolish altogether the idea of an original Creator, to find the Deity himself in some ancestral stock, and in effect to worship ourselves therein? The most besotted form of Pagan worship is wisdom compared with this. The most ignorant idolater, whose only source of instruction has been the light of nature, can teach the philosopher of the nineteenth century better than he would teach the less worldly-wise than himself!

The conclusion, I repeat, is inevitable, that if such progressive changes have taken place, they cannot have been of from higher to lower, but from lower to higher forms. Indeed, the whole new theory is that there has been a continuous change for the benefit of the individual changing—that the progressive and consecutive modification by Natural Selection inevitably tends towards a correspondingly progressive exaltation of the races engaged in it; and as no retrogression would have that effect, the higher in the scale each kind is, and therefore the better able to provide for its wants and necessities as having more resources and appliances for self-preservation in the face of difficulties than other less highly endowed creatures, it follows that we must retrograde in thought if we would seek out and discover the first original of these gradually improving conditions, and so at last arrive at the lowest conceivable exis-

tence, the rudest form of entity that ever had existence, the 'Parent of all,' and truly 'least understood.'

Again, as already said, this process of Natural Selection is supposed to be in consequence of the necessity that arises to any species, so to call it, to preserve its existence. But if so—if that which it seeks to retain the acquirement of be necessary to its existence, how has it managed to exist as a species before, when no doubt adverse influences prevailed from time to time? and how does it manage to exist during the exercise of the energy for such acquirement? If the retention of it is thenceforward not to be necessary to it, why does it make the endeavour to obtain it? Why is it not satisfied as it is? Why does it not let well alone and abide in the condition which must have sufficed for the preservation of the lives of its ancestors or it could never have come into being itself? Is it not, moreover, easy to imagine that what is beneficial to the individual itself might be prejudicial or injurious to its next heir?

If, I repeat, there existed an inherent power in any creature of adapting itself in its whole conformation and form of existence to the conveniences of an altered position, it is reasonable to suppose that such a power would be found the most effective in animals which already were possessed of, or had by such process previously gained, a higher organisation than other kinds had attained to, or than they themselves had had before. But is it not obvious, as already shown, that it is not so in the case of the highest of all animals, in man, and even if it were the case, and the evidence of its being so came under the observation of our senses, still, as it has been shown that if we struck off these adventitious adjuncts we must go backward and backward till we arrive at some one, the common source of all, this one must have existed either as a species or as an individual; if as an individual, it could not have continued to exist for a single day unless the circumstances in which it found itself were already suitable to the continuance of its life; and if, on the other hand, it existed as a species, how came some individual or

individuals of the species to be gifted with a power to improve its or their condition, while others of the same species continued as they were? If, as I said, it was good for any one or more individuals of this or that species to have the power to acquire by the force of inward impulse some permanently improved change of condition, it must have been equally good for each, for all of the same kind. Why, then, did they not all have it? Wherever any of them had the power from, why did not the same giver give it to all of them? What prevented them all from having it? Who elected or proposed any of them to a better position than their fellows? On any other supposition than that just now adduced, if the whole of the individuals that composed the species were able to advance to some higher specific form, so to call it, there would still exist but one apparent species, the elder one being discarded or left behind, or rather merged in the advancing one, and so, species after species, still only one species, and how, then, can we, by this mode of reasoning, account for the immense variety of species, genera, and classes, which undoubtedly, to all appearance, 'live, move, and have their being' on the earth? Or even if, on the other hand, the supposed power of adaptation is contended to be not so powerful in higher and more intellectual as in lower forms; this must equally bring us back in thought at once, instead of by degrees, to the lowest of the low, and we shall have to argue that the rudest mass of shapeless matter was in the beginning conscious of some inward yearning, the result of which in the present day is, through the acting of the self-same power age after age, the appearance on the earth of man and all the animals, every one in turn a result of some other. I think this must be allowed to be a *reductio ad absurdum*, but it is the only logical conclusion to which the premises of the modern theorists, if granted, must lead. Surely the crude form could have had no inward inspiration after a higher state. *Ex nihilo nihil fit*, but if these arguments be based on truth, how did the creature which first felt this longing obtain it? For even the possession

of that must be an improvement on some still ruder condition, and so we are forced back in thought to the time when even this longing could not have been felt, because not possessed, and so we should get something out of nothing, mind out of mere matter, and all the varied and countless beauties of creation out of a chaos which the fiat of no Deity produced, but which were one and all in the womb of old Time, the work of nothing, the atom itself divided till we can no longer trace it even in thought.

Above all, in the case of man, how can his 'personal identity,' as such, be traced through the stages of all these transmigrations? From whence came moral responsibility? From whence the moral sense? and from what lower kind of creature was conscience derived—that conscience, the voice of which within us every one has heard speaking at some time or other? By what act of volition, acting on what accidental change of circumstances, was it obtained? Or was it latent from the first in the lower form of animal life? I fear me that the *mens conscia recti* does not always exist, and has not always existed in any one of us. Often *post equitem sedet atra cura.* Not only so, but its 'whips and stings' will always, sooner or later, corrode the mind, unless, indeed, the sting is taken out of the scourge by that which is the very foundation of all Christian belief—the main doctrine of a certain old-fashioned book, whose account of the Creation even when most widely interpreted, and the Darwinian Theory, flatly contradict each other. Set this aside, and how by any possibility can the possession of conscience be beneficially connected with the original exertion in its acquirer of some desire for it, or be a good when obtained. Set this aside, I repeat, and it becomes the veriest curse to him. His desire after a higher state could never be satisfied without something which shall nullify the foreboding with which otherwise the possession of conscience could only fill his mind. The sense of degradation is all that he obtains, the utter reverse of anything like a gain. Conscience is, indeed, a means most useful to the

highest of all ends, but if there be no such end, the having it is worse, ten thousand times worse, than useless. It was in that case a most unnatural selection! But that we have it is a fact, and what is more, it is a fact that no man living can get rid of it.

Will the theory of Natural Selection account for the versatility of genius, the diversity of tastes and pursuits, the variety of dispositions which we see in the different individuals of one and the same attainment of rank in the scale of creation? Besides, unless the theorists suppose that all the creatures, as they now appear to us, have arrived at the last stage which was the object of their endeavours in the way of Natural Selection, the supposed changes must still be going on, at all events in the comparitively lower forms, and if so, we should either have some evidence of it ordinarily presented to our senses or should have some records of such in the pages of antiquity. But what is the fact? There is nothing of the kind seen, beyond those trifling and temporary adaptations already spoken of. On the contrary, in the vast majority of instances, we see that there is no capacity for adaptation, and that if any such be attempted the individual perishes in making the experiment. There are many caterpillars that feed indiscriminately on the leaves of a great variety of trees or plants, but there are others which only, so far as we know, feed on one, will feed on no other, and will perish unless that one be provided for them.

Does not this new doctrine contradict, and is it not irreconcilable with the fact—a fact universally known and universally evident—that the great object of the life of numberless creatures is the mere perpetuation of its kind *as its kind*, an object which has no sooner been gained in the last and briefest stage of the vast majority of kinds of insects, than they immediately die, leaving their progeny to the same course of a comparatively long existence in the egg, the caterpillar, and the chrysalis state; then for a similar destruction to follow immediately on the deposit of their eggs, as soon as they, too, have arrived at the perfect state? They have no time for the exercise of this supposed

Natural Selection. They are born, lay their eggs, and die. They have been dormant in the egg and in the chrysalis state, and the caterpillar condition is the only one in which they have had even the bare possibility of any such energising. But is it conceivable that in that imperfect stage, the creature, even though a stronger caterpillar than ordinary, should exercise thought for a change of form or condition in the higher state, the state of perfection, the *imago* state, to which it has not yet attained? If a change is desired at all, it must be supposed to be by the perfect insect. But the perfect insect often has no wants to supply, as in the case of the *Bombycidæ*, and consequently can feel no desire for any change of a state which could not be bettered, because it has no wants. It often dies as soon as it has laid its eggs.

We are told that all these beneficial acquirements are the result of the will of the creature acting on some fortunate state of things in its condition. If so, as every permanent change we see cannot have come of itself, all either must have been the result of the action of the will, or, if not, who, as before asked, is to draw the line and say which were and which were not? When, then, we see, as is said to be the case, traces of the stripes of the zebra showing themselves occasionally on the young of the horse and the ass, and these are asserted to be an evidence of all the three animals being of one and the same origin, whatever the cause may be that reproduces these not advantageous additions to some plainer previously existing form, why cannot the same power reproduce former-existing advantages by doing away with any present disadvantages which have set them aside in either of the species inferior to the other.

Those who maintain that the species of a genus have all spruug from one common ancestor, and adduce in proof of the supposition the occasional exhibition in the course of generations of this or that character that existed ages before in a remote form, are the same persons who believe that all genera, and all orders, and classes even, are deduced from some dozen or half-

dozen original forms, or even, judging, they say, from analogy, from one, so that unless they tell us what number of generations is to be gone back through to trace out that now remote but once new character, we must, on their supposition, pass by all those and look for the occasional exhibition still of the characteristics of the first or lowest form of all in the animals of the present day. Why should traces of such a modern acquirement as are the stripes of the zebra show themselves in the young of the horse or of the ass? Why should not the cloven foot of the frog take the place occasionally of the solid hoof of the charger, and thus exhibit to the world his claim to a much more remote ancestry?

It is, I think, an untenable assertion that the variability of species is owing to excess of food; for this supposition would not meet the case of permanent varieties of many species of insects, the whole of each brood under which such varieties are included being placed in precisely similar circumstances as to food; and even when it is not so, the varieties remain just the same, the scarcity or superabundance of food not affecting the individuals in that respect.

Surely the fully admitted great number of varieties in species, in every species no two individuals, in fact, being perfectly alike, as no two, perhaps, ever have been since the world began, is an argument, the general appearance of each species sufficiently distinguishing it as such nevertheless under all these variations, in favour of the individual separate identity of each species, rather than the notion that, as they all apparently run into each other, they are all one and the same.

It is evident that the progressive changes spoken of must have taken place, if at all, in animals of the same classes, that a new apparent species of bird must have diverged from a bird, an animal from an animal, and a fish from a fish. But in each of the classes we have species of the most diametrically opposite habits.

On the other hand, is it conceivable that any promptings

within the lion, suggested by the necessity for providing itself with food, should have exhibited themselves in a tendency to 'eat straw like the ox,' or *vice versâ*, that the ox should desire the sustenance of the lion? *Non dente petit bos.*

No; the impulse *intus datum* prompts, and only prompts, every creature to follow to the end the mode of life to which it has pleased God to call it, and to turn aside therefrom neither to the right hand nor to the left. Even in the case of those insects which do feed for enjoyment, if not for sustenance, in the perfect stage of their being; how can a butterfly whose anticipated supply of the honey of a flower has been blighted by a backward spring be supposed to attempt, though there should be some malformation of its proboscis, to nibble at the leaves of a plant in order to preserve its life in some other form, and to look through the vista of innumerable ages before it, and rest contented in the vision of a descendant in the shape of a quadruped, the successor of some vast variety of intermediate grades? Would the desire of the butterfly to hover about the flower to extract its honey, have instructed it by degrees in the way, if that supply failed, to crush stones in a gizzard newly formed within it for the purpose? How is it to exist in the transition state? Would the ostrich have been led to endeavour to escape its pursuers by flight? Has it ever yet been able to rise from the ground? Can we imagine any tendency in a bird once supplied with wings to do without them? I trow not. *Aquila non captat muscas*; nor does the fly-catcher attempt to chew the cud. It is suggested, indeed, I see, that the ostrich became dispossessed of wings through finding that it could defend itself better against its enemies by kicking out with its heels than by attempting to fly away from them with inferior wings!! But if such a supposition is worthy of notice at all, the question may be asked how came it first to have inferior wings? Nor is it the fact that it can so well escape from its enemies without wings as it could if it had them. If, then, it has lost what wings it ever had, this is a degradation and not an advance, a following up of

the tendency of a defect, instead of an endeavour to improve upon it through experience of its deficiency.

It is suggested, as I have already said, by the theorists, that what they call the struggle for existence, which the multiplication of the different races makes necessary between them, is the cause of the self-adaptations by species from time to time to the changed circumstances which may surround them by their taking advantage, at the same time, of any fortuitous change in themselves which may render such adaptation more easy, and that thus fresh apparent species are produced. But what do we rather see to be the case? Surely the destruction, or at least, the temporary apparent destruction, of the less favoured kinds, which are overwhelmed by the advance of some other kind or kinds, either accidentally or intentionally introduced, or which some change in cultivation or temperature has aided to the disadvantage, even in these very respects, perhaps, of the others. In the case, for example, of the water-weed, which has made such rapid progress in our canals since its recent introduction, the effect has not been to impel previously existing plants to change their forms, but to overwhelm them, but by no means, to annihilate them, any more than to cause a specific change in them. For the soil has been filled age after age with their seeds, and in time, should circumstances favour their development, they will spring up again, and that, perhaps, to the forcing aside in turn of those which had once overcome their race. And when that time comes, those seeds will spring up into plants, the counterparts of those from which they had descended, another instance of the vitality of seeds of which we have had such a remarkable proof in the germination of the grains of wheat, preserved for 3000 years in the mummy cases of old Egypt.

That nothing like the number of individuals produced of any kind survive to produce others is a thing well known to every one; but what is it that limits the multiplication of the different races of animated nature? Not the warring against each

other of each and every kind, or of every individual of the kind, but the laws of nature, utterly inscrutable to us, and which our limited faculties will never be able to comprehend. One year we have a large show of fruit-blossoms, vast numbers of which come to maturity. Another year, even with the like promise of fruit, an orchard scarcely produces a peck. But is this caused by a war of apple-tree against apple-tree, or of the pear against the plum, or the cherry, singly or combined, against the apple, or of each of these against the other? Æsop Redivivus, or perhaps, rather a modern Ovid, who favours us with a new book of Metamorphoses, says that it is so. Yet trees that stand singly fare no better than those that are crowded ever so thickly together. We cannot see 'whence the wind cometh nor whither it goeth,' and so neither can we tell the cause of the blight. In a few years, at the most, the balance is struck again, the hindering cause is removed, and once more we 'enjoy, in due time, the fruits of the earth in their season.' All the while, not one of the trees of the orchard has either been, as a species, annihilated or changed, nor does it show the slightest tendency from any such cause to a specific change. But who or what is the governing power that orders and directs these things? ONE, and ONE only—the 'CREATOR and PRESERVER' of all.

Then, secondly, as to climatial influences.

The new theory, as before stated, assigns the name Natural Selection to a supposed process going on through countless ages of the world's existence, by the operation of which new forms have sprung in increasing numbers from old ones, and these, in their turn, before from still older ones again, and so on, backwards and backwards, as I said, till all are found to have lived and moved, and had their being, though now so diverse in form, in one common root.

Changes have been produced in temperature by drainage, by cultivation and other causes, natural and artificial, and others may and probably will be produced. Suppose, for instance, that the Atlantic and Pacific Oceans were to be united by an

open and navigable canal through the Isthmus of Darien, it is easy to imagine that this might affect the Gulf Stream, as it in turn would the isothermal lines, and they the temperature, and it again the face of nature in divers countries.

But even if granted that place must be taken into the account, and be allowed to have influence in the modification of the varieties of species, it does not follow that time must be allowed an equal and a corresponding influence.

The agency of the former, acting through climate, soil, food, and other causes, has long been known to produce diversities varying in amount. This is the case, not only in some of the larger divisions of the globe, but also in more circumscribed spaces, as even in our own island. Not only will a series of *Vanessa Cardui*, from different quarters of the globe, show perceptible gradations of difference, its main features, however, remaining still the same, so that a specimen from either quarter can be challenged as identical with one from either of the others, but at home also local influences have always been known to prevail to a certain, and in some individual cases, even to a very marked extent. Thus it is with the 'Wood Ringlet,' the ring in the North being changed in the South for a white speck, the latter variety most rare in the North. I have never seen but one in Yorkshire.

And here, as the sheep has been adduced as an instance of the change produced by climatial influences, which change is itself argued from in favour of the doctrine of the production of supposititious species by such and other influences, let me advance an argument the other way from the same animal. The texture of the wool is only one change that may occur to it; its colour is another. Every spring, in almost every flock, we see a black lamb, which in time grows into a black sheep, but is in no other respects different from its pale-faced brother; no stronger, as if its had been the original hue, and they had deteriorated from it; no weaker, as if it was a degeneracy from them, or rather theirs an improvement on its. This year, a ewe in a flock near me

had three lambs, two of them black, and one white. Now, in some species, positively proved to be such, not so much by their external appearance as by the whole habits of their lives, there is no perceptible difference from allied species but that of colour. For instance, the grey crow (*C. cornix*). Here we have a bird which, both in its internal parts, in its size, in its form, and in its features, is the exact counterpart of the crow (*C. corone*). In its habits it is widely different, and acts under the same circumstances in an entirely opposite manner, but otherwise differs solely, I believe I am correct in saying, in its colour, and not always even in that. Apply this to the case of the sheep. If it were the case that the so-called species are produced by a tendency to improve the inferior condition in which any had before, at some time or other, existed, and if it be true that all apparent species, species not such it is said in reality, but only apparent species, are thus produced, the operation of this tendency must be the producing cause of the lesser varieties we see around us, steps in the same direction. But if, on the other hand, we see a variety, as for instance, that of the black lamb, to which variety of costume not even the most speculative fancy can assign any use or benefit to the animal in any stage of its existence, a variety which stops where it is and never goes any further, does not this tend to upset the whole theory? If there is any use or benefit in it, what is it? Why has not the tendency that produced it done the same by its twin brother or sister, and its cousins, more nearly or more distantly related? How is it that no man's ingenuity has ever been able to discover the benefit of it? How is it that all the rest of its kind fare and flourish the same, and as well as it does? How is it that there is no increase whatever in the relative number of such varieties, but that they remain to this day as they ever have been, exceptional, though continuous cases, each and every one of them a mere *lusus naturæ*. Will the theorist draw the line for us between such and those to which a 'beneficial use' is assigned.

The same may be said of any monstrosity that ever has been

produced in the world, as for example, as already mentioned, the possession of six fingers instead of five.

If they were of no use, how came they to be produced by the operation of that tendency which the theorists say is for the use and benefit of the kind of creature in whom it operates. If they be of such use, how is it that they are not perpetuated, but close with the life of the individual, and are not hereditary, except in very rare instances, for even two generations together? The same may also be said of giants and of dwarfs, of people with red hair and with black; in fact of every variety which though sometimes more or less hereditary, is yet by no means sufficiently so to prove the argument which the upholders of the new doctrine would draw from such. They must, on their own showing, answer the question before asked, '*Cui bono?*' before they can prove anything in favour of their line of reasoning from them.

And so the sheep will remain to all intents and purposes a sheep. No change of outward garb alters its nature into that of a wolf. It never becomes a wolf in sheep's clothing. No change of place, nor, so far as any record of the world's progress enables us to judge, of time, has ever yet induced a leopard to lie down with a kid, or a tortoise to turn into a hare. Aristotle and Pliny would have given the natural history of each and all of these and all other animals in precisely the same words that Linnæus or Cuvier would in modern times. The horse of the Assyrian sculpture of old that stands out so life-like before us on the walls of the British Museum, is in every attitude and posture the self-same noble animal that 'paweth in the valley and rejoiceth in his strength, he goeth on to meet the armed men. He mocketh at fear and is not afrighted; neither turneth he back from the sword. The quiver rattleth against him, the glittering spear and the shield. He swalloweth the ground with fierceness and rage, neither believeth he that it is the sound of the trumpet. He saith among the trumpets, Ha,

ha, and he smelleth the battle afar off, the thunder of the captains, and the shouting.' Job xxxix. 21—4.

It is obvious that for every divergence to a variety, whether it assumes a so-called permanent form, or exists merely through the life of an individual, there must be some cause, and a fatal argument against the new theory appears to me to be the fact that while an artifical removal of some, though only of some animals, from one climate to another (or even a change of food, as in the case of the bullfinch fed on hempseed,) will produce a change in those animal's external appearance, so the bringing of these kinds of animals back to their natural habit will at the same time adapt them again in many cases, or their descendants, to the outward conditions which are most congenial to them, while, at the same time, of numberless other species, the vast majority are not one whit affected by any change whatever. The law ought to be universal, or at all events general, or it is of no service to the theorists. Can you ever, by any process of removal or by any change of diet, or any other means, bring back an established and real species so as to call it to any other supposed previous condition?

If the argument deduced by the theorists from the instance of the change that takes place in the wool of the sheep on removal from England to the West Indies were of any value as a rule, it ought to be the same with all other animals. For if their assumption of variations from their original form was owing to inward tendencies induced by a struggle for the support of life, should we not find on that supposition that all species, so to call them, of animals would incline to equal or still wider separation, and that all animals would exhibit under such circumstances a like endeavour of nature to adapt themselves thereto for their support and preservation under changed circumstances or shifted localisation? For if all creatures, the highest and the lowest, have come down from one common origin, must not those which have not yet obtained the high grade still yearn for it, if it be the object to be aimed after for their better support?

The preceding remarks have had reference only to the former of Mr. Darwin's two works, that, namely, on 'Selection by Species.' I have embodied in them some observations which were set down for reading at a former meeting of the British Association at Oxford, but which, having to leave before the time fixed for reading them, were mislaid by the gentleman with whom I had left them for the purpose, and could not be found till afterwards.

I have added a considerable number of other remarks to these, and have thrown the whole into the form of questions. I disclaim all dogmatism on this or any other subject, and have, I hope, said not a word that need give offence to any one.

All I do is to propose these questions, to which, with all deference, I do not think that plain and straightforward answers can be given.

If I am mistaken, I should be glad to have the answers to them free from circumlocution, quibbling, or a mist of words.

All I want is, I would say again, a definite and intelligible answer to each separate question, and as a life member of the British Association of not a few years' standing, I hope that in thus doing I am not asking too much of any who may not agree with my opinions, in behalf of myself and those other gentlemen who may think with me upon the subject.

The remarks I had the honour of laying before the British Association at the Meeting at Norwich last year, on the present subject, had reference only to the first of Mr. Darwin's two works, namely, that on 'Natural Selection.' The few observations I have at present to make are called forth by his second work, on the 'Variation of Species.' I should have said that a more inconclusive, illogical, book than the former I had never read, and that I should suppose there could scarcely be one more so, but if I had said so it would only have been an instance and illustration of the truth of the old saying, that it is

unwise to advance too hastily to a conclusion, for I had not then seen his second work on the 'Variation of Animals and Plants.' I ask any reader of it whether for absolute, unmitigated inconclusiveness as to the main doctrine it is not of the two *facile princeps*?

Nothing is easier than to heap together a mass of facts, of some by way of premises, and of others by way of conclusions; but to connect the two together is by no means always so easy. At all events, whether easy or difficult, it is a result which Mr. Darwin, as it seems to me, has utterly failed to attain. That I not only assert, which is readily done, but shall be able, I think, as I proceed, to prove, which is not much less so, as it appears at least to myself.

He begins by saying, in the introduction, in an epitome of his previous work, that man could do nothing to cause a variation of a species, unless the species had within itself the possibility of varying, or as he calls it, a tendency to vary; a self-evident truism, which I suppose no one will wish to dispute. Nor has any one even contended that species are not more or less subject to variation. They are so occasionally even in their wild state, when such variations are nothing more than other monstrosities, and only accidental and temporary, though much less commonly so than in their cultivated state, when these can be perpetuated and still further diversified, so long as, but only so long as, artificial culture is applied to them. It should also be borne in mind that such culture may occasionally be the means of bringing back an animal or plant to its proper form rather than the contrary, for the present wild state of its species may by accident have been such as may not have been suitable to it, and so have caused its deterioration instead of preserving it in what would otherwise have been its normal condition. If any one had ever contended that every variety, whether of natural or of artificial origin, had the rank of a distinct species, Mr. Darwin's book might be conclusive in disposing of so untenable an opinion. But his mistake, the one great mistake, the one great cardinal error, as it appears to me, which runs through

the whole of his work, is in supposing that because many mere varieties had their origin in one common ancestor, therefore all distinct species are to be similarly accounted for: his whole argument is a *non sequitur*.

It is no argument, but mere assumption, that because the whole of animated nature is joined together (including fossil species with their "*imperfection* of record!") by a series of links, even though almost imperceptibly following on to one another, therefore the whole chain has come from a single unit.

Many varieties of pigeons may present, and do present, far greater differences, both of plumage and of form, than numbers of allied wild species; but this really does nothing to prove his theory. All the varieties he speaks of are only kept as such by careful isolation from others: remove the check, and they invariably tend back to the form or the habit of their original stock—to that they are true. And equally is it the fact that that original stock is true to itself. You may turn the magnetic needle on one side, but leave it to itself and it 'still points to the north.'

Take for instance, to begin with, the case of the strawberry. Mr. Darwin mentions that in the year 1746, in France, only three varieties of this fruit were known, while now the kinds are almost innumerable. This is nothing new to tell us, nor does it furnish one iota of proof that *Fragaria vesca* has not a specific identity of its own, and that it has affinity to the fir tree, the elm, or the oak. The question is, how long will the finest of these varieties maintain itself in its new and artificial form, if left to itself, and removed from the cultivated ground in which it has been forced? Let him transplant it back again to the common soil of the hedge-bank, and place it among the wild ancestors from which it sprang, and in a much less time than it took to foster its unnatural growth it will return to its humble original form again. So it is with the common pansy: not only as I remarked on a former occasion, will every cottage garden afford a proof that it is impossible to keep up

the fine varieties of this plant except with care and cultivation, but Mr. Darwin himself records that from the finest cultivated varieties, plants perfectly wild, both in their foliage and their flowers, are frequently produced. Nay, he further states that such cases would be still more common than they are, if gardeners did not pull up such false plants when they appear in their beds.

Again, he tells us that on certain larger, and also smaller, islands there are species of birds or animals which are peculiar to them, and are found in their particular forms nowhere else. It is a well-known fact, which no one has ever denied. His supposition is, that they originally came from the neighbouring mainland, and by degrees, in the process of vast ages, lost their original characters, and assumed those which they at present have. But he gives no *cui bono* for such changes, and it is from first to last a gratuitous assumption, and without the shadow of a proof. His whole argument is that, because they are found on certain islands, and none of the same sorts on the nearest continent, therefore they must have arrived there from elsewhere, and have become changed from what their ancestors were on their first arrival in former ages. But stray and wandering birds do not always arrive on a distant shore in pairs, and these at the least there must have been, on his supposition, and this, too, in the case of every one of the various kinds he is speaking of, or there could have been no descendants from them. But even if they did so arrive, when they did, they must have found their new country either suitable to them, like the old one they were driven from, or the contrary. If suitable, what need of any change in them? If the contrary, how did the first emigrants to it manage to live unchanged? How did their successive descendants, and this through countless ages, which is the Darwinian theory, manage in like manner to flourish and abound until they assumed their present forms accommodated to their new country? What need either, to successive generations, of

the infinitesimal changes which each year of those long ages must have witnessed before the supposed change to the present forms, even those most gradually acquired? No doubt such facts are among the most difficult that meet us in the study of natural history. The kangaroo is peculiar to Australia, the grouse to Britain, and we have none of the humming-birds or monkeys which are so plentiful—the former so beautiful, the latter so amusing and grotesque—on other continents, the few at Gibraltar being only exceptional, and probably imported. But we have only to remember what acclimatisation has done within the last few years to see that transported birds or animals need to acquire no change of form to fit them for living in any other country of similar general character to their own, or even in some that are not. The rabbit has multiplied to such an extent in Australia as to become a serious evil in some places; but it is nothing but a common rabbit still. The sparrows make themselves just as much at home there as they do here without changing a feather of their plumage. The robin and the thrush, when transported to Botany Bay, sing as sweetly there as here, and the settlers need not to be told that they are the robin and the thrush of their native land. The herring now abounds in those southern seas, and the price of the salmon will, no doubt, soon be much the same per pound with our cousins on the other side of the world as with us. Their sheep send wool to keep down the price of that of our native flocks. Tea is now produced elsewhere than in China; and 'the fruit of the vine' 'maketh glad the heart of man' at the Cape of Good Hope as well as on the banks of the Rhine, with no greater number of different sorts than are to be found in the numberless vineyards of Germany, France, Portugal, and Spain. So it is with insects; the varieties that occur in places wide apart are no greater or more strongly marked than those we meet with in perpetual, though intermitted, succession in the strongholds of the kind: a change of locality is by no means always necessary to produce them. Let a new continent or island be raised out of the

depths of the ocean, as has been the case before now, and the birds and the insects that will come to tenant it will be no new creations, but the very same that will be seen elsewhere, and if they should become modified in appearance at all by climate, or by food, no more than has been, or would be again, the case, in the country they have left, with those that have remained there. Even in our own country we see species isolated far from others in very few and widely separated localities, the difficulty about which is no less, their food-plants being the same in various other places, and all surrounding circumstances apparently the same, than that which occurs to us with regard to those insects and birds which are peculiar to particular islands or continents. Besides which, it must be remembered that there is no more difficulty in the way of the latter to prevent them from flying back to the countries they are supposed to have emigrated from, than there must have been in the first instances. And, if so, it is natural to suppose that they would, in process of time, revert to the pristine forms they are imagined to have had in the land of their ancestors. But why do we see none in the lapse of those long ages already restored to that form, and thus doing away with the present insulation of their kinds? or why not some in the various degrees of the transition states of reversion, corresponding to those which must have been gone through in acquiring their present forms, if the supposed theory were correct? Why *omnia vestigia* one way, and *nulla retrorsum*? Only the day before yesterday I saw *Lycœna Corydon* in plenty on Breen Down, on the Bristol Channel, which I had last seen alive near Newmarket, in Cambridgeshire. So also *Lycœna Arion* at Polebrook, in Northampton, as elsewhere, near Bedford, Landport, Bolt Head, and Charmouth. 'It's a far cry to Lochow!' The wild horses that snuff the fresh air of the Pampas are nothing but the descendants of those of the Spanish settlers, from whom they strayed, or by whom they were purposely let loose. Fresh-

water shells and other creatures, and organic bodies in great numbers, have been found embedded in bricks in the pyramid of Dashour by Professor Unger, most of them represented at the present day just as they were then, 3000 years ago; also wheat, barley, the pea, and flax. But it is not so with artificial and forced varieties of species. As the fanciers have fostered them into new and fantastic forms, the ones that had been in fashion then are no longer cultivated, and where are their descendants now? Their forms no longer remain; their names are the only record and perpetuation of them, if even their memories are not perished with them!

When I stated, at the last meeting, the fact of the reversion of the pansy to its wild condition if left to itself, some gentleman thought proper to contradict the statement; but it not only is confirmed by Mr. Darwin himself, but he confesses that 'by the aid of a little selection carried on during a few generations, most of our cultivated plants could probably be brought back without any great change in their condition of life to a wild, or nearly wild condition.'

No doubt of it! but surely this only proves that these varieties are mere varieties, and have nothing of a separate species about them: it affords not a scintilla of argument in the way of proof that the wild hearts-ease is an offshoot from the poppy, the marigold, or the sunflower, or other garden flowers from different other wild plants. The case, he is obliged to admit, is precisely the same in numberless instances with animals and birds, as well as with plants. He allows that no one would expect that any single one of our present breed of pigs would retain, if allowed to run wild, its short muzzle and legs, and its tendency to fatten. Dray-horses in like manner (I quote his own instances) would lose their massive proportions if suffered to run wild in cold or mountainous regions, as is the case as a matter of fact with those which have been left to stray on the Falkland Islands. The cultivated cabbage, which here comes so

true to seed, cannot form heads in hot countries. Ducks forced on by confinement and food to lay earlier than the usual time, lose the habit in the third generation, and hatch again contemporaneously with the common ducks. Not only will tame pigeons lose their acquired characters if no longer bred for the purpose, but even in their artificial state young birds will sometimes be produced with the marks that distinguished their one common ancestor, the wild rock-dove, *columba livia*. So it is also with the fowl—so with the sheep. It is not unusual in the case of the hornless Southdowns, to find lambs with short horns. Ancient authors describe the sheep of Spain as being black, red, or tawny, and it is thought that the original colour was dark, as still shown by the not unfrequent occurence of black lambs, and that the white colour is not the natural one.

Again, I refer to Mr. Darwin's own instances, cattle which have been without horns for 100 or 150 years, still occasionally produce calves which have horns.

But I need not multiply cases of this kind, nor follow Mr. Darwin in his somewhat tedious enumeration of the varieties of the pigeon—the tumbler, the frill-back, the pouter, the carrier. the fantail, the turbit, the owl, the trumpeter, the laugher, the nun, the Jacobin, and a host of others; nor those of the fowl—the Spanish, the Dorking, the Cochin, the Malay, the Polish, the game-breed, &c.; nor into those of the horse, the ass, the pig, the dog, the goose and others; all proving simply nothing, but that they have respectively come, in spite of all their differences, from common ancestors of their several kinds, and those ancestors specifically distinct, each of them from others. Some too of his facts can hardly be called such, as, for instance, that when young birds, hatched under a turkey or a hen, scuttle off at the approach of danger, their instinct is to give the dam warning to escape, and not rather to provide for their own safety. It seems strange also, that he should remark that though the oak and other trees must have produced galls from primeval

times, yet they do not produce inherited excrescences of the kind, seeing that these galls are no produce of the tree itself at all, but the effect of the work of an extraneous insect, the *cynips*, which has deposited its egg on the leaf or stem, and caused the result spoken of. Surely also, it is very unsafe to borrow an argument as to a mere variety of the dog, or any other animal, from an engraving on an Egyptian monument, for no exact scientific accuracy is there pretended to, and for aught Mr. Darwin can tell, the form of the particular dog or other creature described, may have been thus handed down to posterity on account of some special peculiarity of formation which made his master desire to perpetuate it on the enduring stone.

Mr. Darwin no doubt has brought forward a vast mass of curious and interesting facts, many of them indeed well known before, and for ages, but the greater portion of them collected together for the first time, but they one and all, on his own showing, relate to changes of a mere temporary character, and in not one of them has he proved that a real new species (if so one might in such case call it) has been established from any of the changes which accident, cultivation, or domestication has introduced. A continuance of the artificial forms thus produced may be kept up, or increased, or multiplied, so long as the like conditions of cultivation are continued, but probably for three generations only if such unnatural stimulants are not maintained, or not even for more than one, if the tame and the wild are paired together.

Then the work of return to the pristine form is seen to begin at once. Nature asserts and reasserts her rights, and before long every trace of the extraneous modification that had been introduced has gone out of sight and been lost. But not so the original species from which it sprang—that remains as before, *unus et idem*. I have been informed by a gentleman who resided several years in Canada, that the two common white English butterflies, *Pontia Rapæ and Napi*, having formerly

been introduced into some cottage-gardens in the neighbourhood of Quebec, have since spread into various parts of the country, and that they are still identical with those we see every day here. If they have existed without change so far, why not continue so to the end of the chapter?

Yes, the old species remains, and is even proved to be so by any exceptional cases. Mr. Darwin's improvement on the law of nature is contradicted each day in the year by the evidence of the senses of every one. Half a dozen seasons ago, he might have appealed in apparent support of his argument, so to call it, to the absence, or absence to the common eye, of those small flies, the little black *Aphis*, which the next year appeared over the whole country, or nearly the whole country, as every newspaper testified, in such vast and inconceivable multitudes, which could but remind one of the plague of flies in Egypt of old. Small, minute, and fragile as they were, the very air for miles and miles was full of them. And this I say, over the whole country, and for aught I know over other countries as well. As you drove, or rode, or walked along the fields, roads, or lanes, you had constant need to stoop your head to avoid being blinded with them. Where have they left Mr. Darwin's argument? It is nowhere. Now you scarcely ever see a single one, one might almost say; but no doubt at some future time, in obedience to a mandate the workings of which are utterly inscrutable to any bodily or mental sense of ours, they will appear once more, and, weak as they are, will upset a whole library of the lucubrations of our would-be philosophers. Take the case of another species. What is it that makes the culture of hops so profitable one year and such a dead loss the very next? Nothing but the presence or the absence of another kind of this curious tribe of insects. From this one cause alone, the amount of duty paid on hops in this country has varied in different years from 15,400*l.* to 468,000*l.*

Nor is this an isolated case. I need not tell entomologists, who know the fact so well, that every season adds numberless illustrations of the like kind. No two years together are this,

that, and the other species equally rare or equally common. *Colias Electra*, scarcely ever seen in the North, appeared a few years ago in numbers everywhere: so it has been with *Sphinx Convolvoli*, *Vanessa Antiopa*, and with a host of others, nay, more or less, with every single species that exists. What do they, one and all, say to Mr. Darwin's theory? They give it the lie direct.

I will not give expression to any thoughts of my own on the theological part of the subject, nor is it necessary, for Mr. Darwin himself admits in the two concluding lines of his work that, 'Thus we are brought face to face with a difficulty as insoluble as is that of free will and predestination.'

This might have been told him before he began his book, and his two volumes have not contributed one iota to solve it. On the contrary, he has but pointed out a path for others to wander on in into the most hopeless chaos of thought, in a 'confusion worse confounded' than even his own. And this is well commented on in an article in the *Saturday Review*, a publication which I suppose will not be accused of any especial leaning to the dogmas of faith, or any bias towards their inculcation. It thus disposes of the natural results of Mr. Darwin's theory—'Archimedes could have moved the world had he been sure of his standpoint, or, as newspaper writers say, of his leverage; and the Positivists, as they are all for the religion of science, must accept this among other dynamical laws. Before we affirm or deny their power to upset the present Kosmos, we may make some inquiries about their leverage. "Osmosis" is their answer; but when we come to look into it, this Osmosis, on their own showing—Osmosis, *i.e.* filtration—depends upon settling a moot point between Mr. Darwin and Mr. Herbert Spencer. Osmosis is not only a theory, but is a theory made to account for facts which, whether they exist or not, is a question upon which these distinguished physicists are at issue. Is it Pangenesis or Physiological Units? As to Pangenesis, if we remember rightly, Mr. Darwin suggested it, and tentatively,

only as a new theory, while as to the doctrine of Physiological Units, we should be surprised to be told that Mr. Spencer's conclusions have been accepted by the scientific world. Neither Pangenesis nor Physiological Units, then, being proved, the New York Positivists base their doctrine on Osmosis—that is settle the doctrine of life—upon principles of the existence of which even the authors of certain speculations on this subject have not satisfied themselves. And further, they do not get even so far as the alternative between Mr. Darwin and Mr. Spencer for the basis of their new faith; for these apostles, after accepting and doubting with the same breath the revelations which those whom they deem to be authorities are not clear about, propose a third hypothesis called Cellular Genesis for their doctrine of Osmosis, which must have been developed by the inner consciousness of "Box No. 6,055."'

Again, 'An indictment against the whole human race is not likely to be a very short document. The history of human folly and error in one hundred volumes folio, which Lord Lytton makes his hero to have projected, could not be much more elaborate than the confutation of every conviction and conclusion, every religious and moral system, every philosophy of life, every chart and scale of truth hitherto accepted by mankind, which we have lately received from a body of reformers constituted at New York. "The First Positivist Society of New York, Box No. 6,055, N.Y. Post Office," have addressed themselves *urbi et orbi*, or rather to the Kosmos generally, with a creed in full. And very full indeed it is. It settles, on principles, firm as Teneriffe or Atlas, these little matters—a "Scientific Religion; the Dynamic Theory of the Universe; Time and Space Explained; Force and Its Changes to account for all Phenomena; and a New System of Morals." Twelve columns of the *New York World* are, after all, a narrow canvass on which to display this gigantic procession of new truths. Considering that the advocate of the human race, Anacharsis Clootz, confined himself and his sublime mission to the scanty purpose of redressing social

and political disorders, the regenerators of humanity have been moderate in compressing into forty articles and an appendix the credenda of the new gospel, which, as their prophets say, "taken together, cover the whole of human activity, thought, and emotion, and place life, progress, and reform upon a solid basis." Forty Stripes, save one, is the burden laid upon our shoulders by a (so-called) bigoted State Church, but the XXXIX. Articles themselves are but tow and packthread to the forty stern decrees which have been fulminated to the world from Box No. 6,055. Doctor Positivus at New York cannot be said to be brief, but he is emphatic; and, all things considered, seeing that he has only to prove that every religion which ever has existed is sheer nonsense, every system of morals hitherto taught and practised a mere illusion and snare, and every philosophy nothing better than fumbling and stumbling in the dark, forty articles which not only destroy all that the world has ever believed in and held sacred, but also reveal all truth, and settle every doubt and difficulty which ever has been or can be, form, we repeat, a very brief and portable manual.

'*Diruit* of course goes before *ædificat*, and before the New York Positivists build up their new world they must get rid of the old one. And a very clean sweep, indeed, they make of it; the besom of destruction is plied by a strong and willing hand. We prefer to let the iconoclasts enumerate the idols which they have shattered:—"It is no longer possible for an honest inquirer to accept as true any of the prevalent religions. . . . . The great need of our age is a thorough and entire change of all human thoughts, feelings, hopes, and interests, from the ancient theological subjective and illusory suppositions of Hebrew and Christian mythology to the modern, objective, practical, and positive conclusions, previsions, and rewards of science." A pleonastic enumeration of the effete human hopes and interests which are got rid of is given, and we are asked with a grim and sarcastic air of triumph to attend to the results of "the inevitable creed of the new Faith. It sweeps at once into the limbo of vacuity all notions and hopes

that the mass of our race from its earliest history has hitherto rested upon as they passed from the womb to the grave. We find ourselves in a new world." Very new, indeed, and without much to fill it; for it is asked, "Where under this view are "creation," "end of the world," "personal gods," or "God," "the immortal spirit" or "soul" of man, the "heaven," "hell," "devil," "sin," "repentance," "resurrection" . . . and the "feelings" that have led and held man upward. All these vanish." M. Auguste Comte surveys the world despoiled of "all human thoughts, feelings, hopes, and interests." He has blotted out from the firmament "all notions and hopes" which have hitherto lighted the path of humanity, and which as a fact, whether true or false, have made man to be what man is, and he stands in a universe ghastly as the lunar sphere, in which there is neither God nor spirit. Doctor Positivus assuring us that immortality, any notion of Deity, any recognition of the soul, or any conception of sin, repentance, and judgment to come, are consigned for ever to the limbo of vacuity, we run to the New York Post Office, Box No. 6055, to discover what this very New World is peopled with and does consist of. At first the inquiry seemed rather superfluous; for the New York Positivists boast that the great end at which they have arrived is simply the Buddhist Nirwana, only "a Nirwana more complete and real." But there is a real distinction between the Buddhist and the Positivist absorption. It has been doubted whether the Buddhist Nirwana is absolute nihilism; at any rate the New York reformers, whether correctly or not, treat the Oriental absorption as passing into the infinite and eternal, while to themselves there is no infinite and no eternal; and with this Positivist nihilism, if we understand it, which we have a shrewd suspicion that we do not, there is no anything except that everything which is nought, and that transcendental nought which is everything. But we shall be told that with the Positivist there is something, though we are by no means certain that "thing" is an orthodox word in the new Faith.

'This thing is Force: Force is the sole reality. "The real secret of life and growth is the play of force, called Osmosis, *i.e.*, filtration." This is the new Gospel; and we are thankful to get it in its most condensed and elementary form. All religious hopes and fears, human interests and duties, being got rid of, we stand face to face with the one solid incontrovertible truth, majestic in its simplicity and power—"Osmosis, *i.e.*, filtration." We do not find from the dictionaries that Osmosis, if it is taken from *ὠσμὸς*, means filtration at all, but is simply a formation from *ὠθέω*, *trudo*, but the creator of a new word has a perfect right to make his own Greek. Osmosis, then, is the new Gospel; or rather everything is Osmosis. We are Osmosis. God, if there be a God, which there is not—man, only he is an aggregate of cells—the human will, but this is only a succession of cellular vibrations—all are Osmosis. This brave o'erhanging firmament, this majestical roof, fretted with golden fires—this piece of work noble in reason, infinite in faculties, in form and moving express and admirable, in action angelic, in apprehension godlike, this beauty of the world, this paragon of animals, this quintessence and microcosm—this Man is only Osmosis. Immortality, the life that is to be, all hopes, all passions, all desires, fears, aspirations, all duty, all sensation, reflection, memory, and will, all that ever has been, is, and is to be, things material and spiritual, human and divine, are Osmosis. So all with one voice, about the space of two hours, cried out, "Great is Osmosis of the Positivists."

'An assured conclusion on the evidence may be only attainable by naturalists; an ordinary reader requires neither scalpel nor lens to recognise a typical peculiarity of constant occurrence in writers of Professor Haeckel's school. They have been philosophers before they became naturalists. They have studied Hegel and Spinoza until their minds have become imbued with a conception of the universe little in harmony with the intuitive conclusions of common sense. They are prepared to welcome the transmutation hypothesis, not from any preponderance of actual observations in its favour, for the weight is in the

other scale, but from its professing to demonstrate *à posteriori* what has already been inferred *à priori*. The consequence is that their case is argued in a metaphysical spirit, very unsatisfactory to those who are less anxious to perceive what *must be* than to know what *is*. Haeckel's power of ignoring objections far exceeds his dexterity in solving them, and he deals fluently in ingenious speculations on the conformity of development to right reason, without seeming to suspect that, whatever their value, they cannot *demonstrate* anything, and that one authentic instance of a periwinkle developing into an oyster, not to say an otter, would be more to the purpose than the very best of them.'

'Dr. Weismann writes on the same side, and contributes some interesting illustrations from his especial pursuit, entomology. He surrenders, however, the philosophical basis of his theory, by the admission that vertebrates cannot be held to have originated from invertebrates. If each of the four great natural types has a distinct origin, we must admit at least four creations, and why not four hundred or four thousand? Haeckel is more consistent, and more intrepid. He maintains that the transition from invertebrates to vertebrates may be plainly detected in that interesting animal, the sand-eel; to which he naturally attaches extreme importance, esteeming it a species of title-deed, as it were, enabling men and monkeys to establish their common descent from the *cimex lectularius*.'*

As to the speculations on the origin of man, which all the supporters of this school of writers naturally lead to, they 'out Darwin Darwin' till the 'force of folly can no farther go.' 'The mere multiplication of such facts as those collected by Sir John Lubbock,' says an able writer, 'adds nothing to the evidence in the point at issue.' 'The important question,' says Humboldt, 'has not yet been resolved whether the savage state, which even in America, is found in various gradations, is to be looked upon as the dawning of a

* *Saturday Review*, Nov. 21, 1868.

society about to rise or whether it is not rather the fading remains of one sinking amidst storms, overthrown by overwhelming catastrophes. To me the latter seems to be nearer the truth than the former.' Max Muller says:—'As far as we can trace back the footsteps of man, even in the lowest strata of history, we see that the Divine gift of a sound and sober intellect belonged to him from the very first, and the idea of a humanity emerging slowly from the depths of an animal brutality can never be maintained again.' Niebuhr also has expressed his conviction that all savages are the degenerated remnants of more civilised races, who had been overpowered by enemies, and driven to seek safety in woods and waste places till they had forgotten most of the arts of settled life, and gradually sunk into the state in which they are now found. The learned researches of Professor Rawlinson all lead to the same conclusion.'

I will conclude with some further remarks from the *Saturday Review* on the results of these theories, and no less forcible than amusing they are, *mutatis mutandis* as proposed in the Preface.

'As far as we can make it out, the theory of the universe and all that it contains, and the secret of Being, according to Professor Protoplasm is this; 'There exists first a cell, then force. How the cell came to be a cell, or how force came to be force, or what might be meant by the self-existence of force, or whether force is eternal, we are not told. Force acts on cell for ever and ever, if there is such a thing as ever and ever. Force is in constant circulation; force vibrating through cells produces life, emotions, growth, habit, affinities, and what you like. What used to be called evil thoughts, said to proceed out of the heart—murders, adulteries, fornications, thefts, false witness, blasphemies, which defile a man—are only vibrations acting on the cellular tissue not so well, we suppose, as they ought to act. But whether well or ill ought scientifically to be predicated of any action of force on a cell, in this system in which 'sin' has no place, may be questioned. On

the other hand, what used to be called virtues are only another and more harmonious set of vibrations. The character of all human actions therefore is subordinate to the dynamical law of correlation, and Osmosis accounts for everything. But Osmosis having no choice, can dictate no choice, and, therefore, which is the practical matter, responsibility has no place in this new Church and world of the future. It is, we fear, but poor work, after explaining with such clearness as we could compass, this Gospel of Osmosis, to point out that Professor Protoplasm does not hold out an encouraging view of the working of his system. Rewards and punishments in the next world we have, of course, got rid of, because there is no next world, but as far as this world, regenerated under Osmosis, is concerned, and in the political conditions to which it is to be subjected, the only penalty which it is proposed to enforce in the filtrated Utopia is one for bringing into the world too many children. Property, capital, and political economy are at once to cease. Every woman must have the privilege of bearing children; if no permanent relation can be formed, she may select one temporarily. The apostles of the religion of humanity have banished the Creator from His works; they have deposed the Ruler and Judge of the world; they confound man with nature; they have by abolishing a future life, made the present life not only not worth living, but a curse in itself. But we feel quite sure that in one respect these reformers have improved upon the "old subjective Bible and prevailing beliefs." They have imagined a hell worse than that of theologians, AND WOULD TURN THE WORLD INTO THAT HELL.'

In consequence of Professor Huxley's remarks on the subject at the Meeting at Exeter, I wrote to him as follows:—

'NUNBURNHOLME RECTORY, HAYTON, YORK,
September 16, 1869.

'SIR,—At the meeting of the British Association at Exeter,

you stated that all my objections to Mr. Darwin's theories had been already answered.

'I shall feel obliged if you will tell me where I can find these answers.

'I am, Sir,

'Your obedient servant,

'F. O. MORRIS.'

The following was his answer:—

'THE ROYAL SCHOOL OF MINES, JERMYN STREET, LONDON,
September 30, 1869.

'Sir,—Your letter of September 16 has only come into my hands within the last day or two.

'You will, I believe, find fair answers to all your objections to Mr. Darwin's views in,

'1st. Five or six years serious and practical study of physical and biological science, accompanied by due discipline in the principles and practice of inductive logic.

'And 2nd. A return to the "Origin of Species," after this indispensable preliminary discipline, and a perusal of its pages with the same earnest desire to grasp their real meaning, as, I doubt not, animates you when you read your Bible.

'I am, Sir,

'Your obedient servant,

'T. H. HUXLEY.'

My reply to the Professor was as follows:—

'NUNBURNHOLME RECTORY, HAYTON, YORK,
October 6, 1869.

'SIR,—I am sorry that I have been unavoidably prevented, until to-day, from sending a reply to your obliging note of the 30th ultimo, which I received on the 2nd instant, in answer to mine of the 16th of September.

'In answer to the inquiry as to what work the answers you

spoke of at Exeter, as having been given to certain objections urged against Mr. Darwin's speculative theories were to be found in, you now specify none, but suggest a general study of "Biological Science," &c., and then of Mr. Darwin's own book.

'This is rather a vague extrication from a specific statement, and savours somewhat, *me judice*, of "arguing in a circle," or "begging the question."

'For the suggestion, however, of such a course of study you have my best thanks, and in return I will recommend your entering, as soon as possible, at one of the ancient Colleges, or, better still, at one of the small new Halls at Oxford (or still a newer one might be founded for the purpose, to be called St. Darwin's), and I really have no doubt but that after your "five or six years'" severe study therein (such as I have long since gone through, myself), you will, when you have passed your "Little Go," have learnt sufficient of logic, as taught at the grand old University, my "Alma Mater," to be able to understand and explain the meaning of the terms *petitio principii*, *ignoratio elenchi*, "*undistributed middle*," &c.—the want of which knowledge you are aware is the weak point of the disciples of Darwin, and of their oracle himself—and even also of that so useful formula as a *memoria technica*, *Bokardo Ferison habet*, &c., &c., which though only gibberish, as the tutors will no doubt instruct you, contains much more "sense and meaning" than such conveniently grandiloquent expressions as "Matter and spirit are but names for the imaginary substrata of groups of natural phenomena." "In itself it is but of little moment whether we express the phenomena of matter in terms of spirit, or the phenomena of spirit in terms of matter." "The extension of the province of what we call matter and causation, and the concomitant gradual banishment from all regions of human thought of what we call spirit and spontaneity." "Traced back to its earliest state, the nettle arises as the man does, in a particle of nucleated protoplasm!" &c. &c.

'You will find it, I assure you, a very profitable study.

'I have long since extracted whatever meaning there is to be found in Mr. Darwin's book on the "Origin of Species," and have elsewhere given that work the credit it deserves as a valuable collection of interesting facts. It has, moreover, the merit of being so plainly written that any person of the most ordinary capacity cannot fail to understand its meaning, a quality which I may add certain other works and writings are notoriously deficient in, and particularly those of a writer who *injicit ampullas et sesquipedalia verba*, and finds persons ready enough to take all in and swallow it all as conclusive—but there is no accounting for tastes.

'With reference to your studies at Oxford, allow me also to recommend to you as a valuable addition to your library, though I think it highly probable some kind friend will have already directed your attention to it, Dr. McCann's masterly pamphlet, entitled "Anti-Darwinism," wherein he justly exposes the shuffling and unfair manner in which his arguments were "shirked" at Exeter—though indeed for the best of all possible reasons. It is highly amusing to persons who can appreciate a thorough exposure of such practices, and I would hope may do no little good to those who make Mr. Darwin's most singularly inconclusive book their Bible.

'I am, Sir,

'Your obedient servant,

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'F. O. MORRIS.

'P.S. I intend to print my two papers on the subject, and to preface them with some remarks, which will, I doubt not, suggest thought, if not instruction, to many. I hope also to make good use of your own obliging favour, for which, on that account, I beg leave again to thank you.'

The "Professor" did not find it convenient to answer this: I confess I did not much expect that he would.

Spottiswoode & Co., Printers, London and Westminster.