
Marx
Machiavelli
Chesterton
Emerson
Joyce
Abbott
Hardy
Montaigne
Cooper
Austen
Defoe
Melville
Haggard
Hugo
Carroll
Christie
Eliot
Grimmer
Stoker
Molière
Wilde
Maupassant
Byron
Einstein
Fitzgerald
Engels
Schiller
Garnett
Hawthorne
Smith
Kafka
Goethe
Dostoyevsky
Cotton
Hall
Baum
Kipling
Doyle
Willis
Henry
Leslie
Dumas
Nietzsche
Flaubert
Turgenev
Balzac
Stockton
Vatsyayana
Crane
Burroughs
Verne
Curtis
Tocqueville
Whitman
Gogol
Vinci
Homer
Widger
Tolstoy
Busch
Darwin
Thoreau
Potter
Freud
Zola
Twain
Scott
Lawrence
Plato
Kant
Jowett
Stevenson
Dickens
Harte
Andersen
Burton
Hesse
London
Descartes
Cervantes
Poe
Aristotle
Wells
Voltaire
Hale
James
Hastings
Cooke
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Shakespeare
Irving
Richter
Chambers
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da
Doré
Swift
Dante
Shaw
Benedict
Alcott
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Essays: Scientific, Political, & Speculative, Vol. I

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ESSAYS:

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BY

HERBERT SPENCER.

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(OTHERWISE FIFTH THOUSAND)

Containing Seven Essays not before Republished, and various other additions.

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PREFACE

Excepting those which have appeared as articles in periodicals during the last eight years, the essays here gathered together were originally re-published in separate volumes at long intervals. The first volume appeared in December 1857; the second in November 1863; and the third in February 1874. By the time the original editions of the first two had been sold, American reprints, differently entitled and having the essays differently arranged, had been produced; and, for economy's sake, I have since contented myself with importing successive supplies printed from the American stereotype plates. Of the third volume, however, supplies have, as they were required, been printed over here, from plates partly American and partly English. The completion of this final edition of course puts an end to this make-shift arrangement.

The essays above referred to as having been written since 1882, are now incorporated with those previously re-published. There are seven of them; namely—"Morals and Moral Sentiments," "The Factors of Organic Evolution," "Professor Green's Explanations," "The Ethics of Kant," "Absolute Political Ethics," "From Freedom to Bondage," and "The Americans." As well as these large additions there are small additions, in the shape of post [iv] scripts to various essays—one to "The Constitution of the Sun," one to "The Philosophy of Style," one to "Railway Morals," one to "Prison Ethics," and one to "The Origin and Function of Music:" which last is about equal in length to the original essay. Changes have been made in many of the essays: in some cases by omitting passages and in other cases by including new ones. Especially the essay on "The Nebular Hypothesis" may be named as one which, though unchanged in essentials, has been much altered by additions and subtractions, and by bringing its statements up to date; so that it has been in large measure recast. Beyond these respects in which this final edition differs from preceding editions, it differs in having undergone a verification of its references and quotations, as well as a second verbal revision.

Naturally the fusion of three separate series of essays into one series, has made needful a general re-arrangement. Whether to follow the order of time or the order of subjects was a question which pre-

sented itself; and, as neither alternative promised satisfactory results, I eventually decided to compromise—to follow partly the one order and partly the other. The first volume is made up of essays in which the idea of evolution, general or special, is dominant. In the second volume essays dealing with philosophical questions, with abstract and concrete science, and with aesthetics, are brought together; but though all of them are tacitly evolutionary, their evolutionism is an incidental rather than a necessary trait. The ethical, political, and social essays composing the third volume, though mostly written from the evolution point of view, have for their more immediate purposes the enunciation of doctrines which are directly practical in their bearings. Meanwhile, within each volume the essays are arranged in order of time: not [v] indeed strictly, but so far as consists with the requirements of sub-classing.

Beyond the essays included in these three volumes, there remain several which I have not thought it well to include—in some cases because of their personal character, in other cases because of their relative unimportance, and in yet other cases because they would scarcely be understood in the absence of the arguments to which they are replies. But for the convenience of any who may wish to find them, I append their titles and places of publication. These are as follows:—"Retrogressive Religion," in *The Nineteenth Century* for July 1884; "Last Words about Agnosticism and the Religion of Humanity," in *The Nineteenth Century* for November 1884; a note to Prof. Cairns' Critique on the *Study of Sociology*, in *The Fortnightly Review*, for February 1875; "A Short Rejoinder" [to Mr. J. F. McLennan], *Fortnightly Review*, June 1877; "Prof. Goldwin Smith as a Critic," *Contemporary Review*, March 1882; "A Rejoinder to M. de Laveleye," *Contemporary Review*, April 1885.

London, *December, 1890*.

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THE DEVELOPMENT HYPOTHESIS.

[*Originally published in* The Leader, *for March 20,* 1852. *Brief though it is, I place this essay before the rest, partly because with the exception of a similarly-brief essay on "Use and Beauty", it came first in order of time, but chiefly because it came first in order of thought, and struck the keynote of all that was to follow.*]

In a debate upon the development hypothesis, lately narrated to me by a friend, one of the disputants was described as arguing that as, in all our experience, we know no such phenomenon as transmutation of species, it is unphilosophical to assume that transmutation of species ever takes place. Had I been present I think that, passing over his assertion, which is open to criticism, I should have replied that, as in all our experience we have never known a species *created*, it was, by his own showing, unphilosophical to assume that any species ever had been created.

Those who cavalierly reject the Theory of Evolution as not being adequately supported by facts, seem to forget that their own theory is supported by no facts at all. Like the majority of men who are born to a given belief, they demand the most rigorous proof of any adverse belief, but assume that their own needs none. Here we find, scattered over the globe, vegetable and animal organisms numbering, of the one kind (according to Humboldt), some 320,000 species, and of the other, some 2,000,000 species (see Carpenter); and if to these we add the numbers of animal and vegetable [2] species which have become extinct, we may safely estimate the number of species that have existed, and are existing, on the Earth, at not less than *ten millions*. Well, which is the most rational theory about these ten millions of species? Is it most likely that there have been ten millions of special creations? or is it most likely that, by continual modifications due to change of circumstances, ten millions of varieties have been produced, as varieties are being produced still?

Doubtless many will reply that they can more easily conceive ten millions of special creations to have taken place, than they can conceive that ten millions of varieties have arisen by successive modifications. All such, however, will find, on inquiry, that they are under an illusion. This is one of the many cases in which men do not really

believe, but rather *believe they believe*. It is not that they can truly conceive ten millions of special creations to have taken place, but that they *think they can do so*. Careful introspection will show them that they have never yet realized to themselves the creation of even *one* species. If they have formed a definite conception of the process, let them tell us how a new species is constructed, and how it makes its appearance. Is it thrown down from the clouds? or must we hold to the notion that it struggles up out of the ground? Do its limbs and viscera rush together from all the points of the compass? or must we receive the old Hebrew idea, that God takes clay and moulds a new creature? If they say that a new creature is produced in none of these modes, which are too absurd to be believed, then they are required to describe the mode in which a new creature *may* be produced—a mode which does *not* seem absurd; and such a mode they will find that they neither have conceived nor can conceive.

Should the believers in special creations consider it unfair thus to call upon them to describe how special creations take place, I reply that this is far less than they demand [3] from the supporters of the Development Hypothesis. They are merely asked to point out a *conceivable* mode. On the other hand, they ask, not simply for a *conceivable* mode, but for the *actual* mode. They do not say—Show us how this *may* take place; but they say—Show us how this *does* take place. So far from its being unreasonable to put the above question, it would be reasonable to ask not only for a *possible* mode of special creation, but for an *ascertained* mode; seeing that this is no greater a demand than they make upon their opponents.

And here we may perceive how much more defensible the new doctrine is than the old one. Even could the supporters of the Development Hypothesis merely show that the origination of species by the process of modification is conceivable, they would be in a better position than their opponents. But they can do much more than this. They can show that the process of modification has effected, and is effecting, decided changes in all organisms subject to modifying influences. Though, from the impossibility of getting at a sufficiency of facts, they are unable to trace the many phases through which any existing species has passed in arriving at its present form, or to identify the influences which caused the successive modifications; yet, they can show that any existing species—

animal or vegetable—when placed under conditions different from its previous ones, *immediately begins to undergo certain changes fitting it for the new conditions*. They can show that in successive generations these changes continue; until, ultimately, the new conditions become the natural ones. They can show that in cultivated plants, in domesticated animals, and in the several races of men, such alterations have taken place. They can show that the degrees of difference so produced are often, as in dogs, greater than those on which distinctions of species are in other cases founded. They can show that it is a matter of dispute whether some of these modified forms are varieties or separate species. They can show, too, that [4] the changes daily taking place in ourselves—the facility that attends long practice, and the loss of aptitude that begins when practice ceases—the strengthening of passions habitually gratified, and the weakening of those habitually curbed—the development of every faculty, bodily, moral, or intellectual, according to the use made of it—are all explicable on this same principle. And thus they can show that throughout all organic nature there *is* at work a modifying influence of the kind they assign as the cause of these specific differences: an influence which, though slow in its action, does, in time, if the circumstances demand it, produce marked changes—an influence which, to all appearance, would produce in the millions of years, and under the great varieties of condition which geological records imply, any amount of change.

Which, then, is the most rational hypothesis?—that of special creations which has neither a fact to support it nor is even definitely conceivable; or that of modification, which is not only definitely conceivable, but is countenanced by the habitudes of every existing organism?

That by any series of changes a protozoon should ever become a mammal, seems to those who are not familiar with zoology, and who have not seen how clear becomes the relationship between the simplest and the most complex forms when intermediate forms are examined, a very grotesque notion. Habitually looking at things rather in their statical aspect than in their dynamical aspect, they never realize the fact that, by small increments of modification, any amount of modification may in time be generated. That surprise which they feel on finding one whom they last saw as a boy, grown

into a man, becomes incredulity when the degree of change is greater. Nevertheless, abundant instances are at hand of the mode in which we may pass to the most diverse forms by insensible gradations. Arguing the matter some time since with a learned professor, I illustrated my position thus:—You admit that [5] there is no apparent relationship between a circle and an hyperbola. The one is a finite curve; the other is an infinite one. All parts of the one are alike; of the other no parts are alike [save parts on its opposite sides]. The one incloses a space; the other will not inclose a space though produced for ever. Yet opposite as are these curves in all their properties, they may be connected together by a series of intermediate curves, no one of which differs from the adjacent ones in any appreciable degree. Thus, if a cone be cut by a plane at right angles to its axis we get a circle. If, instead of being perfectly at right angles, the plane subtends with the axis an angle of 89° 59′, we have an ellipse which no human eye, even when aided by an accurate pair of compasses, can distinguish from a circle. Decreasing the angle minute by minute, the ellipse becomes first perceptibly eccentric, then manifestly so, and by and by acquires so immensely elongated a form, as to bear no recognizable resemblance to a circle. By continuing this process, the ellipse passes insensibly into a parabola; and, ultimately, by still further diminishing the angle, into an hyperbola. Now here we have four different species of curve—circle, ellipse, parabola, and hyperbola—each having its peculiar properties and its separate equation, and the first and last of which are quite opposite in nature, connected together as members of one series, all producible by a single process of insensible modification.

But the blindness of those who think it absurd to suppose that complex organic forms may have arisen by successive modifications out of simple ones, becomes astonishing when we remember that complex organic forms are daily being thus produced. A tree differs from a seed immeasurably in every respect—in bulk, in structure, in colour, in form, in chemical composition: differs so greatly that no visible resemblance of any kind can be pointed out between them. Yet is the one changed in the course of a few years into the other: changed so gradually, that at no moment can [6] it be said—Now the seed ceases to be, and the tree exists. What can be more widely contrasted than a newly-born child and the small, semi-transparent

spherule constituting the human ovum? The infant is so complex in structure that a cyclopædia is needed to describe its constituent parts. The germinal vesicle is so simple that it may be defined in a line. Nevertheless a few months suffice to develop the one out of the other; and that, too, by a series of modifications so small, that were the embryo examined at successive minutes, even a microscope would with difficulty disclose any sensible changes. That the uneducated and the ill-educated should think the hypothesis that all races of beings, man inclusive, may in process of time have been evolved from the simplest monad, a ludicrous one, is not to be wondered at. But for the physiologist, who knows that every individual being *is* so evolved—who knows, further, that in their earliest condition the germs of all plants and animals whatever are so similar, "that there is no appreciable distinction amongst them, which would enable it to be determined whether a particular molecule is the germ of a Conferva or of an Oak, of a Zoophyte or of a Man;" [1]—for him to make a difficulty of the matter is inexcusable. Surely if a single cell may, when subjected to certain influences, become a man in the space of twenty years; there is nothing absurd in the hypothesis that under certain other influences, a cell may, in the course of millions of years, give origin to the human race.

We have, indeed, in the part taken by many scientific men in this controversy of "Law *versus* Miracle," a good illustration of the tenacious vitality of superstitions. Ask one of our leading geologists or physiologists whether he believes in the Mosaic account of the creation, and he will take the question as next to an insult. Either he rejects the narrative entirely, or understands it in some vague nonnatural [7] sense. Yet one part of it he unconsciously adopts; and that, too, literally. For whence has he got this notion of "special creations," which he thinks so reasonable, and fights for so vigorously? Evidently he can trace it back to no other source than this myth which he repudiates. He has not a single fact in nature to cite in proof of it; nor is he prepared with any chain of reasoning by which it may be established. Catechize him, and he will be forced to confess that the notion was put into his mind in childhood as part of a story which he now thinks absurd. And why, after rejecting all the rest of the story, he should strenuously defend this last remnant of

it, as though he had received it on valid authority, he would be puzzled to say.

FOOTNOTE:

[1] Carpenter, *Principles of Comparative Physiology*, p. 474.

[8]

PROGRESS: ITS LAW AND CAUSE.

[*First published in* The Westminster Review *for April,* 1857. *Though the ideas and illustrations contained in this essay were eventually incorporated in* First Principles, *yet I think it well here to reproduce it as exhibiting the form under which the General Doctrine of Evolution made its first appearance.*]

The current conception of progress is shifting and indefinite. Sometimes it comprehends little more than simple growth—as of a nation in the number of its members and the extent of territory over which it spreads. Sometimes it has reference to quantity of material products—as when the advance of agriculture and manufactures is the topic. Sometimes the superior quality of these products is contemplated; and sometimes the new or improved appliances by which they are produced. When, again, we speak of moral or intellectual progress, we refer to states of the individual or people exhibiting it; while, when the progress of Science, or Art, is commented upon, we have in view certain abstract results of human thought and action. Not only, however, is the current conception of progress more or less vague, but it is in great measure erroneous. It takes in not so much the reality of progress as its accompaniments—not so much the substance as the shadow. That progress in intelligence seen during the growth of the child into the man, or the savage into the philosopher, is commonly regarded as consisting in the greater number [9] of facts known and laws understood; whereas the actual progress consists in those internal modifications of which this larger knowledge is the expression. Social progress is supposed to consist in the making of a greater quantity and variety of the articles required for satisfying men's wants; in the increasing security of person and property; in widening freedom of action; whereas, rightly understood, social progress consists in those changes of structure in the social organism which have entailed these consequences. The current conception is a teleological one. The phenomena are contemplated solely as bearing on human happiness. Only those changes are held to constitute progress which directly or indirectly tend to heighten human happiness; and they are thought to constitute progress simply *because* they tend to heighten human happiness. But rightly to understand progress, we must learn the nature

of these changes, considered apart from our interests. Ceasing, for example, to regard the successive geological modifications that have taken place in the Earth, as modifications that have gradually fitted it for the habitation of Man, and as *therefore* constituting geological progress, we must ascertain the character common to these modifications—the law to which they all conform. And similarly in every other case. Leaving out of sight concomitants and beneficial consequences, let us ask what progress is in itself.

In respect to that progress which individual organisms display in the course of their evolution, this question has been answered by the Germans. The investigations of Wolff, Goethe, and von Baer, have established the truth that the series of changes gone through during the development of a seed into a tree, or an ovum into an animal, constitute an advance from homogeneity of structure to heterogeneity of structure. In its primary stage, every germ consists of a substance that is uniform throughout, both in texture and chemical composition. The first step [10] is the appearance of a difference between two parts of this substance; or, as the phenomenon is called in physiological language, a differentiation. Each of these differentiated divisions presently begins itself to exhibit some contrast of parts: and by and by these secondary differentiations become as definite as the original one. This process is continuously repeated—is simultaneously going on in all parts of the growing embryo; and by endless such differentiations there is finally produced that complex combination of tissues and organs constituting the adult animal or plant. This is the history of all organisms whatever. It is settled beyond dispute that organic progress consists in a change from the homogeneous to the heterogeneous.

Now, we propose in the first place to show, that this law of organic progress is the law of all progress. Whether it be in the development of the Earth, in the development of Life upon its surface, in the development of Society, of Government, of Manufactures, of Commerce, of Language, Literature, Science, Art, this same evolution of the simple into the complex, through successive differentiations, holds throughout. From the earliest traceable cosmical changes down to the latest results of civilization, we shall find that the transformation of the homogeneous into the heterogeneous, is that in which progress essentially consists.

With the view of showing that *if* the Nebular Hypothesis be true, the genesis of the solar system supplies one illustration of this law, let us assume that the matter of which the sun and planets consist was once in a diffused form; and that from the gravitation of its atoms there resulted a gradual concentration. By the hypothesis, the solar system in its nascent state existed as an indefinitely extended and nearly homogeneous medium—a medium almost homogeneous in density, in temperature, and in other physical attributes. The first change in the direction of increased aggregation, brought a contrast in density and a contrast in temperature, between the interior and the exterior [11] of this mass. Simultaneously the drawing in of outer parts caused motions ending in rotation round a centre with various angular velocities. These differentiations increased in number and degree until there was evolved the organized group of sun, planets, and satellites, which we now know—a group which presents numerous contrasts of structure and action among its members. There are the immense contrasts between the sun and the planets, in bulk and in weight; as well as the subordinate contrasts between one planet and another, and between the planets and their satellites. There is the similarly-marked contrast between the sun as almost stationary (relatively to the other members of the Solar System), and the planets as moving round him with great velocity: while there are the secondary contrasts between the velocities and periods of the several planets, and between their simple revolutions and the double ones of their satellites, which have to move round their primaries while moving round the sun. There is the yet further strong contrast between the sun and the planets in respect of temperature; and there is good reason to suppose that the planets and satellites differ from each other in their proper heats, as well as in the amounts of heat they receive from the sun. When we bear in mind that, in addition to these various contrasts, the planets and satellites also differ in respect to their distances from each other and their primary; in respect to the inclinations of their orbits, the inclinations of their axes, their times of rotation on their axes, their specific gravities, and their physical constitutions; we see what a high degree of heterogeneity the solar system exhibits, when compared with the almost complete homogeneity of the nebulous mass out of which it is supposed to have originated.

Passing from this hypothetical illustration, which must be taken for what it is worth, without prejudice to the general argument, let us descend to a more certain order of evidence. It is now generally agreed among geologists [12] and physicists that the Earth was at one time a mass of molten matter. If so, it was at that time relatively homogeneous in consistence, and, in virtue of the circulation which takes place in heated fluids, must have been comparatively homogeneous in temperature; and it must have been surrounded by an atmosphere consisting partly of the elements of air and water, and partly of those various other elements which are among the more ready to assume gaseous forms at high temperatures. That slow cooling by radiation which is still going on at an inappreciable rate, and which, though originally far more rapid than now, necessarily required an immense time to produce any decided change, must ultimately have resulted in the solidification of the portion most able to part with its heat—namely, the surface. In the thin crust thus formed we have the first marked differentiation. A still further cooling, a consequent thickening of this crust, and an accompanying deposition of all solidifiable elements contained in the atmosphere, must finally have been followed by the condensation of the water previously existing as vapour. A second marked differentiation must thus have arisen; and as the condensation must have taken place on the coolest parts of the surface—namely, about the poles—there must thus have resulted the first geographical distinction of parts. To these illustrations of growing heterogeneity, which, though deduced from known physical laws, may be regarded as more or less hypothetical, Geology adds an extensive series that have been inductively established. Investigations show that the Earth has been continually becoming more heterogeneous in virtue of the multiplication of sedimentary strata which form its crust; also, that it has been becoming more heterogeneous in respect of the composition of these strata, the later of which, being made from the detritus of the earlier, are many of them rendered highly complex by the mixture of materials they contain; and further, that this heterogeneity [13] has been vastly increased by the actions of the Earth's still molten nucleus upon its envelope, whence have resulted not only many kinds of igneous rocks, but the tilting up of sedimentary strata at all angles, the formation of faults and metallic veins, the production of endless dislocations and irregularities. Yet again,

geologists teach us that the Earth's surface has been growing more varied in elevation—that the most ancient mountain systems are the smallest, and the Andes and Himalayas the most modern; while in all probability there have been corresponding changes in the bed of the ocean. As a consequence of these ceaseless differentiations, we now find that no considerable portion of the Earth's exposed surface is like any other portion, either in contour, in geologic structure, or in chemical composition; and that in most parts it changes from mile to mile in all these characters. Moreover, there has been simultaneously going on a differentiation of climates. As fast as the Earth cooled and its crust solidified, there arose appreciable differences in temperature between those parts of its surface more exposed to the sun and those less exposed. As the cooling progressed, these differences became more pronounced; until there finally resulted those marked contrasts between regions of perpetual ice and snow, regions where winter and summer alternately reign for periods varying according to the latitude, and regions where summer follows summer with scarcely an appreciable variation. At the same time the many and varied elevations and subsidences of portions of the Earth's crust, bringing about the present irregular distribution of land and sea, have entailed modifications of climate beyond those dependent on latitude; while a yet further series of such modifications have been produced by increasing differences of elevation in the land, which have in sundry places brought arctic, temperate, and tropical climates to within a few miles of one another. And the general outcome of these changes is, that not only has every extensive region [14] its own meteorologic conditions, but that every locality in each region differs more or less from others in those conditions; as in its structure, its contour, its soil. Thus, between our existing Earth, the phenomena of whose crust neither geographers, geologists, mineralogists, nor meteorologists have yet enumerated, and the molten globe out of which it was evolved, the contrast in heterogeneity is extreme.

When from the Earth itself we turn to the plants and animals which have lived, or still live, upon its surface, we find ourselves in some difficulty from lack of facts. That every existing organism has been developed out of the simple into the complex, is indeed the first established truth of all; and that every organism which existed

in past times was similarly developed, is an inference no physiologist will hesitate to draw. But when we pass from individual forms of life to Life in general, and inquire whether the same law is seen in the *ensemble* of its manifestations,—whether modern plants and animals are of more heterogeneous structure than ancient ones, and whether the Earth's present Flora and Fauna are more heterogeneous than the Flora and Fauna of the past,—we find the evidence so fragmentary, that every conclusion is open to dispute. Three-fifths of the Earth's surface being covered by water; a great part of the exposed land being inaccessible to, or untravelled by, the geologist; the greater part of the remainder having been scarcely more than glanced at; and even the most familiar portions, as England, having been so imperfectly explored that a new series of strata has been added within these four years,—it is impossible for us to say with certainty what creatures have, and what have not, existed at any particular period. Considering the perishable nature of many of the lower organic forms, the metamorphosis of numerous sedimentary strata, and the great gaps occurring among the rest, we shall see further reason for distrusting our deductions. On the [15] one hand, the repeated discovery of vertebrate remains in strata previously supposed to contain none,—of reptiles where only fish were thought to exist,—of mammals where it was believed there were no creatures higher than reptiles,—renders it daily more manifest how small is the value of negative evidence. On the other hand, the worthlessness of the assumption that we have discovered the earliest, or anything like the earliest, organic remains, is becoming equally clear. That the oldest known sedimentary rocks have been greatly changed by igneous action, and that still older ones have been totally transformed by it, is becoming undeniable. And the fact that sedimentary strata earlier than any we know, have been melted up, being admitted, it must also be admitted that we cannot say how far back in time this destruction of sedimentary strata has been going on. Thus the title *Palæozoic*, as applied to the earliest known fossiliferous strata, involves a *petitio principii*; and, for aught we know to the contrary, only the last few chapters of the Earth's biological history may have come down to us. On neither side, therefore, is the evidence conclusive. Nevertheless we cannot but think that, scanty as they are, the facts, taken altogether, tend to show both that the more heterogeneous organisms have been evolved in