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McCosh, James, 1811-1894.
Development

DEVELOPMENT

WHAT IT CAN DO

AND

WHAT IT CANNOT DO

BY

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NEW YORK

CHARLES SCRIBNER'S SONS

1883

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TROW'S
PRINTING AND BOOKBINDING COMPANY
201-213 *East Twelfth Street*
NEW YORK




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DEVELOPMENT

WHAT IT CAN DO AND WHAT IT CANNOT DO.

THE phrases Development and Evolution, so frequently used in the present day, have much the same meaning. Both point to one operation seen under somewhat different aspects. Development is the process going on, whereas evolution rather refers to the process as we look back upon it. We speak of the seed developing into the plant, and the plant being evolved from the seed.

There is a constant employment of the phrases and a continued reference to the process. But there is an equally persistent avoidance of an explanation of its precise nature. Instances, many rich and varied, are given, and inferences legitimate and illegitimate are drawn; but there has not been a wise, judicious, and scientific attempt to explicate its components, to spread out its contents, and prescribe its boundary.

The phrases are used to cover all sorts of meanings—"it is a great sheet let down by the four corners upon the earth, wherein are all manner of four-footed beasts and creeping things of the earth, and fowls of heaven." Evolution in itself is a great vehicle moving on from age to age, and from world to world, carrying with it all sorts of wares, precious and baser metals, suns and soils, flowers

and weeds. Scientific men discourse profoundly of the development of worlds and systems of worlds, of plants and animals, of individuals and of species, from the monad on to man. But we hear and read also of the development of the resources of a country, of its wealth, its mines, its gold and silver; its crops and corn, its wheat and fruits; of its sheep, cattle, and horses; of its industry, its trade and commerce; of its cities, their streets, houses, and harbors; of its education, its colleges and schools. They give you histories of the development of the sciences of astronomy, chemistry, and geology, of literature in prose and poetry; of language from its simpler forms up to the higher, such as Greek, German, or English; of the fine arts, as painting, sculpture, and architecture, from their ruder to their highest shapes; and of the useful arts, as masonry, carpentry, and engine-making. They talk, too, of the evolution of things from a simpler to a more complex state; of pottery, of wax-work, of metal-work, of vases, of dinner-sets, and tea-cups. It must surely be a comprehensive phrase, or quite as possibly a loose and ambiguous one, which embraces all these things and a thousand more.

In these circumstances it is surely of moment, when any one is talking of development, for or against, to insist on his telling us precisely what he means by it. "I am sick," says the man of common sense, who is not to be taken in with high-sounding phrases, "of this pretentious power; I prefer the old way of speaking, when it was believed that all things came from God." But I ask this man, who is after all making large pretensions to uncommon sense, whether he is prepared to affirm that he was not developed from his good father and mother; whether he, the man of forty, has not grown out of that boy whom he pleasantly remembers going to school at the age of six. But I am a religious man, he tells us, and I am sure that

God and not development guides the universe. But if he will listen to me, I venture to ask him whether he has any right to dictate to Deity how he shall govern his own world ; whether by development or in some other way ; whether God may not have made this man himself to grow by development ; and whether the same God has not evolved the Christian from the Jewish faith, and the Jewish from the patriarchal. When we lay down the rigid rule for ourselves, that we explain beforehand what we mean by the phrases we employ, we are in a better position to require the same on the part of our opponent, and to insist on knowing what he means by the evolution he is defending. An evolution out of nothing ? An evolution without a God to set it agoing or to guide it ? An evolution of life from the lifeless ? Of mind from the mindless ? Of man from the monkey ? Of the monkey from the mollusc ? Of the mollusc from the monad ? Of all from the senseless molecule ?

SECTION I.

DEVELOPMENT IS AN ORGANIZED CAUSATION.

DEVELOPMENT is evidently not a simple power in nature, like mechanical force, or chemical affinity, or gravitation. It is clear that there is a vast, an incalculable number and variety of agencies in the process, whether it be the development of a sun from star-dust, of the plant from its seed, of the bird from its egg, the horse from its dam, of the threshing-machine from the flail, of the reaping-machine from the reaping-hook, of our present kitchen utensils from those used by our grandmother. The question arises : Is there any unity in "the thousand and one"

things that act in the process? I believe that there is. Let us inquire what it is, and this will settle for us what truth and what error there is in the common expositions, that is development of developments.

The one common quality in the process as denoted by the phrases is, that one thing is developed into another thing, and that one thing is evolved from another. But it is universally regarded as settled that when one thing produces another, or is produced out of another, it is by causation. It follows that there must be causation in development. Causation necessitates development. This follows from the nature of cause and effect as it is commonly apprehended. It follows more particularly from the view which I have given of Energy in the paper on the subject in this series. I have shown that in physical action the cause always consists in two or more bodies which act on each other, and that the effect consists of the same bodies modified; that the ball A striking the ball B constitutes the cause, and that the effect consists of the ball B gaining the energy which A loses. But I need not insist on this here, as whatever be our theory of causation, the cause must be regarded as developing the effect, and the effect as evolved from the cause.

It has been generally admitted for the last two or three centuries (it was anticipated in a vague way from the commencement of reflection) that causation works through all nature, not only divine causation but physical causation, that is, that the ordinary occurrences of nature are produced by agents acting causally. In other words, fire burns, light shines, and the earth spins round its axis and rotates around the sun, and as the issue we have heat and light, and the beneficent seasons. Men of enlarged minds do now acknowledge that in the doctrine of universal causation, of God acting everywhere through second causes,

there is nothing irreligious. On the contrary, the circumstance that God proceeds in a regular manner which can be anticipated, is evidently for the benefit of intelligent beings who can thus so far foresee the future and prepare for it and act upon it. But causation leads to development. If there be nothing irreligious in causation, as little is there impiety in the development which issues from it. It will be shown that development by causation is the plan by which God carries on his works, thus connecting the past with the present, and the present with the future. It was my privilege in my earliest published work to justify God's method of procedure by natural cause and natural law, as specially adapted to man's constitution.¹ I reckon it as a like privilege in my declining life to be able to defend God's way of acting by development, which gives a consecutive unity to all nature, and as a stream from the throne of God flows through all time, widening and deepening till it covers the earth, as the waters do the sea, with the riches it carries.

But development, while it is carried on by causation, does not consist of a single chain with successive causes and effects as its links. The causes as they operate combine and the effects are joint, and we have a great reticulated machine. Development is essentially a combination of causes. It is a corporation of causes for mutual action, an organized causation for ends. The past has developed into the present, which will develop into the future. The configuration of the earth, its hills and dales, its rivers and seas, which determine the abodes and industries of men, and the bounds of their habitation have been produced by agencies which have been working for millions of years. The present is the fruit of the past and contains the seed

¹ Method of Divine Government, Physical and Moral.

of the future. The plants now on the earth are the descendants of those created by God, and the ancestors of those that are to appear in the ages to come.

There is through all times, as in the year, a succession of seasons ; sowing and reaping, sowing in order to reap, and reaping what has been sown in order to its being sown again. This gives a continuousness, a consistency, to nature amidst all the mutations of time. There is not only a contemporaneous order in nature, there is a successive order. The beginning leads to the end, and the end is the issue of the beginning. This grass and grain, and these forests that cover the ground, have seed in them which will continue in undefined ages to adorn and enrich the ground. These birds that sing among the branches, and these cattle upon a thousand hills, will build nests and rear young to furnish nourishment and delight to our children's children in millennial ages. Every naturalist has seen a purpose gained by the nutriment laid up in the seed or pod to feed the young plant. I see a higher end accomplished by the mother provided for the young animal. That infant is not cast forth into the cold world unprotected : it has a mother's arms to protect it and a mother's love to fondle it. Development is not in itself an irreligious process ; every one who has been reared under a father's care and a mother's love will bless God for it.

SECTION II.

DEVELOPMENT IS CAUSATION WORKING IN AN ENVIRONMENT.

SCIENCE has not determined, and never may be able to determine, what are the original constituents of the universe. Some are fond of looking upon them as atoms, some represent them as centres of force, others will allow them to be

only centres of motion—with nothing to move! Whatever they be, there must be millions of millions of them working in the knowable world.

It is by no means certain that we have been able to determine what is the number of elementary bodies in the world. The ancient Greek division into earth, water, air, and fire, merely pointed in a rude way to a division of states—the solid, the fluid, the vaporous, and the ethereal. The number of elements is supposed for the present and provisionally to be sixty-five, but most chemists believe that some of these may be resolved into components.

It would be wrong in us to affirm dogmatically that we know what are the varied forces, or, as some would prefer expressing them, the powers of producing motion. One point, however, has been established in our day, that all the physical energies are in a sense one; that they are all—be it the mechanical, chemical, vital, electric—correlated, and that their sum, real and potential, cannot be increased or diminished.

What we have to do is to observe these entities, elements, or powers as working, and to notice in particular that they operate in the way of evolution.

These existences, with their energies, combine to form causes, and these form combined or organized causes. All of them have affinities with each other. Some of these are stronger than others in themselves, or from the relative position which they occupy. These combine in their action. We may represent the agencies at work by the letters of the alphabet, A, B, C, etc. A number of these, say A, D, P, S, may join and produce powerful individual occurrences—an earthquake, a volcano, a conflagration, a revolution. Or they may abide and produce general issues, continued for hours, or days, or years. Thus the winds combine and go in currents, and we have the trade-winds. Thus the

waters of the ocean are made to flow in one direction, and we have the Gulf Stream, and the cold wave from Labrador.

But these organized causal operations do not embrace, in at least an appreciable or calculable manner, all the powers or causes of the universe; they comprise only a portion as in conspicuous operation. The causes that produce a cyclone in the Indian Ocean, may have no perceptible connection with those that produce a flood in the rivers of America. The moral agencies that produce a revolution in Paris, may have no visible relation with the discontent which leads the Indians to rise and murder their white neighbors in America. But there is no set of causes in our world so isolated that they have no connection with surrounding causes. Possibly A, D, P, S have some relationship with B, E, Q, T. These other powers will so far act on the organized causation and modify it, it may be in the way of strengthening or weakening the tendency, or giving a special direction to the stream. While they do so, they will themselves be affected, perhaps be absorbed or driven off. The winds and ocean currents are all affected by the nature of the land over which they travel. The tides are directed by the nature of the shore, and the seasons, by, it may be, various solar or lunar influences. Every combined mundane agency has a sphere, and this sphere has an atmosphere, or an environment as it is called, which it so far sways, and by which it may be swayed.

SECTION III.

REGULAR RESULTS FROM COMBINED CAUSATION AND ENVIRONMENT.

THE former is a stream receiving contributions as it flows on from the other, which constitutes its banks, that are watered by it, it may be formed by it. From the inter-

action, specially from the unions and separations, there follow certain regularities which are worthy of notice.

There are courses which go on for a time and then disappear. The wind arises from there being a comparative vacuum somewhere, into which it rushes, and then sinks because the inequality is so far filled. There is a high tide produced when the moon and sun are pulling in one way, but it ceases when the two are not acting in unison. There are epochs in which certain motives or impulses prevail—periods of war and conquest, periods of commercial enterprises, periods of the cultivation of the fine arts; these have public opinion for a time in their favor, and then give way before something else. In all such cases the combination of the causes producing the movement is loosened and new combinations are formed.

There are results that abide the same from year to year, and from age to age: that stream has for a thousand years risen in the same fountain, among the same hills, and flowed through the same valleys into the same creek of the ocean. Thus there are plants and animals now living which have not been visibly changed since they appeared millions of years ago in the early geological ages. The Chinese have continued much the same in character, occupations, and mode of life, for thousands of years. In all such cases the same causes have continued to act and produce the same effects. In other cases there have been irruptions, convulsions, and wars which have produced new modes of life; such, for instance, was the irruption of the hordes from the northeast upon the decaying Roman empire.

The most curious instances of regularities are those which are periodic. A certain combination of causes produces certain issues, and is then dissolved, to be succeeded after a certain time by the formation of a like combina-

tion and the same issues following. It is thus that at certain seasons there are daily sea-breezes and daily land-breezes. As more marked and obvious we have the seasons. "While the earth remaineth, seed-time and harvest, and cold and heat, and summer and winter, and day and night shall not cease." Here we have sun and seed and soil concurring to produce an orderly series of events which run their course and are succeeded by a like series. Malarial influences are introduced into the system, which take a certain time to work and to be cast off; and we have diseases lasting four days or ten days or fourteen days. We have such a periodic process in every plant springing from a seed, and every animal from a germ, having a growth and an average life and then dying, but first producing a new life. We have such periods in the movements of the heavenly bodies, as in the precession of the equinoxes.

It is more to our present purpose to remark that in development there is usually progression. At times indeed there is degeneracy, as when plants do not thrive in a nig-gardly soil, and animals get weaker in a deleterious climate. But, upon the whole, there has been an advance in our earth from age to age. The tendency of animal life is generally upward, from all fours to the upright position, from which men can look up to heaven. There are species of plants and animals which have become larger and more robust. Geological causes made our earth fit for the abode of man, who had cereals and cattle provided for him. Human beings have come to occupy places which in earlier ages were handed over to wild animals. There is now a larger amount of animal food than in any previous age. As the ages roll on there is a greater fulness of sentient life, and a larger capacity of happiness. The average life of human beings in civilized countries is in-

creasing. The intellectual powers have been made stronger and firmer, like the trunk of a tree, and the feelings, like the flowers, have been made by culture to take a fuller expansion and a richer color.

Under this head may be placed those grand generalizations which have been so magnified by Herbert Spencer in his "First Principles." He assumes a Persistence of Force in the universe, derived from an unknown and unknowable power beneath it. This leads to a constant differentiation and integration; in simpler terms, a separation of elements, and again an aggregation. He shows that "any finite homogeneous aggregate must lose its homogeneity, through the unequal exposure of its parts to incident forces." Hence the instability of the homogeneous and the perpetual motion in the universe. This scattering issues in an integration. The result is to change an indefinite homogeneity into a definite heterogeneity, and then aggregates of all orders are evolved. Everywhere there is a change from a confused simplicity to a distinct complexity, from a diffusion to a concentration. But opposed there may be a more powerful attraction which separates and diffuses the aggregate: "Evolution and dissolution as together making up the entire process through which things pass." "There is habitually a passage from homogeneity to heterogeneity, along with the passage from diffusion to concentration." This may be expressed in terms of Matter and Motion, "and if so, it must be a statement of the truth that the concentration of Matter implies the dissipation of Motion, and that, conversely, the absorption of Motion implies the diffusion of Matter." In the end, to the vast aggregate, even to the earth itself, Dissolution must eventually arrive, and "universal Evolution will be followed by universal Dissolution."

These generalizations are very wide, and the conclusions

far reaching. Possibly there may be gaps in the processes. The giant, in marching on with his seven-leagued boots, may have overlooked many agencies which modify his theories. He is wrong in declaring that the power underneath the persistence of force is unknown and unknowable. According to his own account it is so far known, it is known to be a power, and a power persisting and working certain effects. It can be shown to be a power characterized by wisdom and love. He omits certain powers which are as patent as those he notices. In particular he regards mind as consisting of nerves, and overlooks all its special properties—of intelligence, conscience, and will. When these are introduced they give a new, and, I venture to say, a juster and more attractive aspect to the whole of nature. I am not satisfied when I find myself and my friends represented as mere developments from homogeneous matter, produced by differentiation. But I am willing to accept his generalizations so far as the physical powers of nature are concerned.

SECTION IV.

EVOLUTION IN INANIMATE NATURE.

“EVOLUTION,” says Herbert Spencer, “is a change from an indefinite incoherent homogeneity to a definite coherent ^{stere} homogeneity through a continuous differentiation and integration.” I am willing to take this doctrine, but I have to unfold it in my own way, which will be less technical, but fully as accordant with facts.

In nature there is a very large, but still definite number of bodies, all acting causally. As they act a number are drawn into aggregates by their mutual attractions or af-

finities, or their proximity. The action is of the nature of causation ; I call it a combined or organized causation. Thus, in our mundane system, we have the sun, planets, and moons, with a certain shape—an oblate spheroid—with a rotation round their axes and round each other. These may be regarded as developments produced by differentiation. As a result of the collocation of the sun and the earth we have the seasons, with their regularities and their irregularities. We have also had the stratified structure of the earth, and mountains heaved up, and valleys between. All this has arisen very much from combined causation. In the aggregates produced there are internal changes going on. Thus the earth is supposed in the geological ages to have become cooled and fitted for the abodes of animated beings. But the combination of causes is in the centre of an immense number of other causes, which may be called its surroundings, or, more technically, an environment. The aggregate and its environment act on each other and produce farther changes, it may be in accumulation, say in adding plant-fostering soil on the earth's surface, or washing away seas and increasing dry land.

But there is a second characteristic of development observable everywhere in nature, and that is a progression. There is an advance from a homogeneous to a more differentiated state in which new aggregates with their functions appear. This may be produced by accumulations of forces breaking out in convulsions, which change so far the face of the earth ; or more frequently by small increments, as the growth of soil by the decay of plants.

In all this I discover order and design. I do not see that the constituents of the world, its atoms or molecules, necessarily produce beneficent results. If left to themselves they might produce evil quite as easily and naturally as good, and might have been formed into destructive

machines and pestiferous creatures, into flaming meteors with burning worlds, into serpents and wild beasts devouring each other and arresting all forms of beauty and beneficence, and yet incapable of dying. But, instead of this, these million agencies combine to accomplish good and benign ends, so as to show that there has been a mind disposing them and an end in view.

Let us notice, first, that the combination of elements acting as causes has produced general laws and beneficent order: in the seasons, in the growth of the plant—first the blade, then the ear, then the full corn in the ear—in the animal enjoying its time, and handing down its life to another generation. All this is not the action of simple properties acting fortuitously or fatally; it is the result of the adjustment of numerous properties of matter—gravitating, mechanical, chemical, electric—all conspiring toward an end.

Secondly, the combination accomplishes special ends, such as those so happily illustrated by Paley and other writers on natural theology. There are, for example, the joints of the bodily frame composed of bones that fit into each other for good ends, namely, easy and convenient movements; the firm clasping of the hand, and the simple forward and backward motion of the fingers, and the ball and socket at the shoulder admitting rotation all round. There are the bodily senses—the eye, the ear, and touch—so delicately adapted to the external world, with which they make us acquainted. There is the whole animal frame, made up of various parts, yet all combining into a living machine of exquisite structure.

Not only is development, when properly understood, not inconsistent with religion, it will be found that the combination and adaptation in it clearly argue design. Sooner or later there will be written a work on natural theology,

after the manner of Paley, showing that as there are plan and purpose in the well-fitted limbs and organs of animals, so there is also design, and this quite as evident and as wondrous in the way in which, by a process running through ages, the bones and muscles have been adjusted to each other to produce the horse we drive or ride on. There is a manifest beneficent end in the knittings of our frame, but there is quite as palpable a purpose in the way in which all the parts have been moulded in the geological ages, and handed down by heredity.

I therefore see design in development. There is an obvious end and a means arranged to accomplish it. We notice purpose evident in the development which man is ever accomplishing. The farmer uses a series of agencies to secure a crop: he ploughs, he harrows, he sows seed, he weeds, and in the end he gathers in a crop. The teacher lays out a plan for developing the faculties of his pupils: he imparts knowledge, he corrects, he stimulates, and he reaches his aim, the improvement of the mind and a fitness for the duties of life. We are ever noticing cases in which there is need of co-operation to accomplish an end. A house is built and furnished because a number of persons have done each his part—the mason, the carpenter, the plumber, the slater, the glazier, the upholsterer. A city becomes rich because the merchants have been far-sighted, the manufacturers expert, and the tradesmen skilful and industrious. The country prospers because the master and the servant, the schoolmaster and the minister of religion, are all and each doing their part. But there are still more wondrous evidences of plan, and in the succession of the seasons, of the grass and grain and trees, and in the living creatures advancing in fulness and strength, in activity and beauty. It is not in the single operation that we discover evidence of a purpose so much as in their

organization and orderly succession and development. Development is a sort of corporation in which each part, like the citizen, fulfils its office.¹

Evolution is not, any more than gravitation, chemical affinity, or any other power or law of nature, an irreligious process. Spencer accounts for all its operations by the persistence of force beneath, and behind which he feels himself obliged to place an unknown power. I, too, am obliged to place such a power ; but to me it is so far a known power. There is more in the production than the persistence of force ; there is an arrangement of all the evolved and involved powers to work for an end, and in this I perceive design and intelligence. I do not stand up for a development any more than I do for a gravitation independent of God. I see God in the persistence of force, and in the beneficent way in which it works. I can see a good purpose worthy of God served by universal gravitation, in binding together all the parts of the universe, however widely sundered. But I can also discover it to be a beneficent arrangement, whereby by evolution the present is connected with the past and the future, and the most remote times are brought together. I do not say that God could not have accomplished these ends in some other way, but he has actually effected them by means of causation and evolution, and I bless him for it.

I see God in development throughout, and from beginning to end. Because a rose, a dog, or horse is gendered by natural causes, it is not less the work of God. Our finest roses are derived from the common dog rose of Europe (*Rosa*

¹ I am not here constructing or defending the theistic argument. If it be objected that the existence of pain sets aside teleology, I simply say that I am not to enter on the subject of the mystery of evil, but I hold that there may be evidence of the existence both of suffering and of love in one and the same world.

canina): that rose with its simple beauty by the roadside is the divine workmanship ; but so is the rose with the fullest form and the gayest color in our gardens. God, who rewards us for opening our eyes upon his works, gives higher rewards to those who, in love to him, or to them, bestow labor and pains upon them. Dogs, it is said, have descended from some kind of wolf. This does not make the highly developed shepherd or St. Bernard dog, with their wondrous instincts, not to be the divine workmanship. Just as little does the hypothesis that our living horse is descended from the pliohippos, and this from the miohippos, and this again from the small eohippos, which used to tread with its five toes on marshy ground, prove that the animal we ride on, so useful and so graceful, so agile, and so docile, is not the creature of the Creator who formed it and endowed it with the power of evolution.

SECTION V.

DEVELOPMENT IN ORGANIC NATURE.

THERE is no difficulty presented to the religious man in development, so far as it relates to inanimate nature ; he may believe in evolution as a mode of divine operation. Doubts and difficulties arise when he is required to assent to its universal application to every form of organized being. But surely if it exists and is prevalent in dead matter without being atheistic it may also be allowed in plants and animals.

It is admitted on all hands to have a place and power in the individual plant and animal, both of which proceed from the seed or germ, take a typical form, and have a normal time to live and produce an offspring. There is a

sense in which the oak is in the acorn, the child is father of the man. Both grow partly by internal powers and arrangements, and partly by external nourishment and accretions from day to day, and from year to year. If any one regards this as taking place independent of God, he is so far an atheist. If he believes it to be accomplished by the power of God, he is thus far a true theist, and his heart may be filled with adoration and his mouth with praise.

Not only is there development in the individual, but also in the succession of individuals. There is here a rotation, the egg from the living being developed into a new living being, producing a new egg. It is equally true that the bird is from the egg and the egg from the bird, and both by evolution. No one will speak against such an arrangement, as it provides children for the comfort of parents and parents to care for children.

But disputes arise when development is carried farther. It is allowed that there is development in the individual, but may it also take place in the species? In other words, can one species grow out of another? To clear the ground for a fair discussion let us look at what is admitted.

It is allowed, nay, maintained, that there is such a thing in nature as distinct species, genera, and orders. These, in ordinary circumstances, cannot be changed into each other. The lily cannot be transmuted into the rose, nor the sheep into the goat. In the common operations of nature every plant and animal is after its kind or species. Figs do not produce thistles, nor do thistles produce figs.

It is also admitted by all that species develop varieties.¹

¹ Prof. Asa Gray writes: "The facts, so far as I can judge, do not support the assumption of every sided and indifferent variations. The variations do not tend in many directions; the variations seem to be an internal response to external impressions."

I believe there is no one tree—oak or pine, elm or birch—precisely the same in the old world and in the new. What a variety of pigeons are there, all descended, it is supposed, from the rock pigeon. These varieties are produced internally, largely by external circumstances, that is, by the environment. In a barren soil and a severe climate an oak will become dwarfed and its descendants will be the same. The dog can be trained to point at game, and a breed will be produced possessing this aptitude. It has to be added that these varieties tend to return, if the environment does not continue to prevent it, to the original type of the species. The cultivated plant, cast out of the garden, will be apt to go back to its wild state. It is usual also that when animals of different species have paired, the horse and the ass for instance, the offspring—the mule—is not prolific and dies out.

We have approached the battlefield gradually, but now we are in the midst of the fight, and we may watch it, even though we do not take part with either side. Two grand questions are before us. One relates to the production of the species at the first. Were the species of amoeba, of molluscs, of insects, of fishes, of reptiles, of mammals (the consideration of man had best be deferred) created, very much as they now are, by the immediate fiat of God at the beginning, or as the ages rolled on? Or were they evolved out of a previous material by internal laws of development and by constant increments from the environment? The second question is intimately connected with the first, In rare and extraordinary circumstances can new species come forth out of the old, as varieties do, and these go down by heredity?

The opinions of the ancients on such a subject are of no value, as they have no scientific basis. Many deep thinkers believed in spontaneous generation, and supposed that

lower animated creatures came out of the sea or bubbled out of marshes, and they did not see anything irreligious in this, as they, or at least a number of them, believed it to be done by a divine power. In the earlier centuries of the modern era, naturalists were carefully observing the species, genera, and orders, with the view of classifying plants and animals, and they were fond of regarding kinds as fixed and immutable. Religious people were inclined to regard all natural species as created by God, and this required, when they came to believe in geological succession, a perpetual creation down to the period at which man appeared. Since the days of Mallet and Geoffroy St. Hilaire there has been an ever-increasing body of naturalists inclined to account for the origin of species by natural law.

Who is to settle these questions, or rather this question, for it is one? This can be done only by long and varied observation and discussion. I certainly feel as to myself that I cannot decide it. The tendency of modern speculation has all been toward the prevalence of development by natural causation. Yet there are phenomena of which it may be said that they cannot at this present time be explained by any natural process. But there is one point on which I am quite as much entitled to speak as any other is: Does religion require us to insist that species and orders in natural science are all fixed forever? that in no circumstances can a new species be produced by natural law?

It is certainly conceivable that the God who created all things should also have created by a direct act, without a medium or without a process, the first member of every one of the hundred thousands of plants and animals on the earth, and then allowed, or, rather, enabled, them to go down by an evolutionary heredity. But it is quite as possible and equally conceivable that God may have organized

the species out of the previously existing materials, even as he made man's body out of the dust of the ground. The essential elements of organisms are oxygen, nitrogen, hydrogen, carbon, with sulphur and iron, and aqueous fluids. These are represented as being the least volatile of the elements and the most permanent in their combination, and because of these qualities they may have been brought and kept together in organisms. It is quite conceivable that out of the constituents of the universe God may have arranged that these should combine to form those aggregates which we call plants and animals, and as the ages run on, to form new species in rare and exceptional circumstances. It has to be added that these elements will not of themselves form living beings without some inherent or superadded hereditary vital power, a subject which will have to be considered separately. Now, it is not for me to say beforehand which of these methods, immediate or mediate, God should adopt. The former of these might seem to bring in God more directly. It certainly makes him interfere more frequently with the works of nature; but then, when he is thus interfering, he is interfering with his own works, which we may suppose to have been planned from the first in infinite wisdom. If it be found in fact that he has chosen the latter method, we are just as much entitled in that case as in the other to discover the action of God, and we may without presumption discover evidences of beneficence. For God does thus secure not only a connection of his works with himself, but a connection of them one with another; and thus, on the one hand, there is a certain stability in natural classes, while, on the other hand, there is a sufficient amount of variety and progression to suit the organism to new positions and provide for the survival of the fittest, which is certainly a good provision.

A number of theories have been devised to account for the production of what seem to be new species. Darwin gives prominence to the principle of Natural Selection, with its accompaniment the Survival of the Fittest; but acknowledges in his later editions that he had attached too much importance to it. The phrase is not a very happy one, as it seems to imply choice, which certainly has no place in the process. But it points to a fact that the weakest plants and animals are most apt to die early and leave no progeny, whereas the strong live and have a more powerful offspring. I do not purpose to give all the theories, or to examine them critically. They differ chiefly in this, that some attach more importance to the operation of the internal elements, others to the external circumstances or environment. Some hold that there is an action producing change, variety, and progression in the components and structure of the organism, in the germ or in its growth. Among those who thus look for the cause of the development in the organs themselves may be mentioned Lyell, Mivart, and Professor Owen, in England; Professor Gray, and Professor Cope in America; and, in Germany, Braun, Gegenbaur, Heer, Nägeli, Virchow, etc.¹ Most of them seem to make the development proceed by gradual steps, scarcely if at all observable; others through a metamorphosis of germs and heterogenetic leaps. Perhaps we may have to take with us both the internal and external causes, in some cases the one, and in some the other being the stronger. The development of the individual certainly involves both an inward power of

¹ We have an admirable work on *The Theories of Darwin*, by Rudolph Schmid, excellently translated by G. A. Zimmermann (Jansen, M'Clurg & Co., Chicago). This work is at once philosophical and scientific, and being now so accessible, renders it unnecessary for me to state and criticize the theories of evolution.

growth, and also external support and nutriment; both are necessary to produce the full form, and the seed which propagates the species. There may be the same principle in the production, in rare circumstances possibly only in the early geological ages, of new species. It is conceivable that in the earlier times aggregates might not have been so fixed as to render germs and species absolutely unchangeable. They seem now to be so determined that the species of animals and plants are comparatively permanent.

It is always to be remembered that in vegetable and in animal development there is more than mechanical energy. Mr. Spencer can scarcely be said to have perceived this; certainly he has not given it its due place and prominence. There is evidently a chemical power in exercise, and this cannot be said to have yet been resolved into mechanism. Then there is a power, which without defining it, was simply called vital by our older naturalists, and which, however it may have been produced, and whatever may be its nature, is in actual operation higher than either the mechanical or chemical. Even Darwin is obliged to bring in a panzoism to account for the genesis and continuance of organisms. Mr. Spencer himself has to use physiological units to explain heredity. What are these but particular exhibitions of the old vital forces?

Perhaps the most remarkable example of this physiological development is to be seen in the progress of the embryo in the womb, as discovered by Von Baer. The germ is apparently (it cannot be so really) much the same in all animals except the lowest; but it becomes differentiated and takes the form of the polyps, the worms, the molluscs, and arthropods, and goes on to the fish, the amphibia, the reptiles, to birds and mammalia. Now this progression, as every one knows, is very much the same

as that of the animal races in the geological ages. This does not imply, as I understand it, that the germ of the mammal, in its ascending process, ever does become a bird or a reptile. It means that there are combinations of agents in the germ and its surroundings, which proceed, that is, are developed after a certain manner, and that from a prearranged combination of matters and forces there has been a like or parallel progression in the whole animal kingdom. All this implies more than mere mechanical energy or persistence of force. Powers are implied, which, in the present stage of science cannot be resolved into the mechanical. Yet in no human machine can we discover more clearly the evidence of a plan and purpose. With these new powers acting, there is now a higher manner and form of development, and we have one generation of intelligent and moral beings succeeding another.

SECTION VI.

WHAT DEVELOPMENT CANNOT DO.

WHILE it can do much, it may not be able to do everything. There is a tendency among eager and hasty thinkers to push every newly discovered truth to an extreme. I am as old as to remember the feeling kindled when Sir Humphry Davy made his brilliant discoveries as to electricity and chemical action. There were sciologists in our schools of popular science, book critics in our newspapers, and wandering lecturers who hastened to make electricity account for everything, for even life and mind itself. This scientific fashion, never encouraged by the great discoverer himself, soon ran and ended its course, and died out in

the struggle for existence as other and equally powerful agents came into notice. Evolution is at present running a like course. The great scientific work of the past age has been to show what it can do; that of the coming age is to lay a restraint upon its career, and to show what it cannot do. Like all creature action it will be found to have very stringent limitations. We may fix on some of these.

I. It cannot give an account of the origination of things. This is implied in its nature and its very name. Development takes place among materials already existing. Evolution is the derivation of one thing from another thing. But the mind does seek after an origin. This has been maintained by Aristotle, and by the profound thinkers of all ages. The principle of causation insists on going back from effect to cause, and from one cause to another, and is not satisfied till it rests in an originating substance possessed of the power to produce all that follows. Evolution implies a set of acting substances. So far from accounting for these, say body with its attractions and affinities, and mind with its thoughts and feelings, it presupposes that these exist and that they are acting. The mind seems to demand an account of these; development cannot furnish this, and has to call in a creator and organizer. Evolution simply shows a flowing and widening stream, implying a fountain, which, however, it conceals in mist.

II. It does not originate the power which works in development. That process shows us objects acting causally, but takes and gives no account either of the objects or the forces in them. To account for them, Herbert Spencer calls in what he denominates the Persistence of Force—a phrase to which some object. But call it what you please, force or power or energy, or the persistence of force, or

the conservation of energy, there is certainly such a thing, not imaginary or hypothetical but real. Spencer thereby accounts for all the action of nature. But he is philosopher enough to know that this implies something behind, beneath, or above it. He is obliged to do this by the nature and necessity of thought. He is constrained to believe this because it is impossible to conceive the opposite, which, according to him, is the ultimate test and criterion of truth. I am not disposed to put the argument in this form, but I join him in holding that we are necessitated to believe that there is a something beyond the matter and force which we notice. With him this is unknown and unknowable, and he kindly and condescendingly makes this the sphere of religion. Yet he himself is obliged to acknowledge that he knows something about it. Indeed it is impossible for him or any one to speak about it, to make any predication of it, unless he so far knows it. He knows it to be a power and to have power; and surely this is knowledge, and rather important knowledge. He everywhere speaks of a necessary "belief in a power of which no limit in time or space can be conceived." This limitlessness is surely a farther knowledge. He can tell a great deal about its working by differentiation and integration, producing happiness and virtue, causing an advance, and finally dissolving all things in a universal conflagration. Such a thing is not absolutely unknown. I agree with him in thinking that there is, that there must be, such a power. But on the same ground as he argues that it exists and is a power, I argue that we know it to be not only a power but a wise power, a benevolent, a righteous power. But evolution has not produced this power, it is the production of it.

III. Evolution of itself cannot give us the beneficent laws and special ends we see in nature. There is in force,

considered in itself, neither good nor evil. It is as ready to work destruction as to promote the spread of happiness. The persistence of force might be a persistence in evil. The separate agencies being blind might as readily produce confusion as order. A railway train, without a head or hand to put it on the right track, might only work havoc. In order to operate beneficently the persisting never-dying force must have collocations, as Chalmers calls them, adaptations or adjustments, as I call them, to enable them to accomplish the good ends which are so visible.

These are of two kinds. One is a general order, or what are called laws of nature, such as the seasons and the periods of animal life. I am inclined to see purposes in the very forms of animals and plants, and the manner in which they grow into their type, while the type ever advances as if to realize an idea. I discover an end in the manner in which plants and animals are produced. Two arrangements are necessary to effect this. First, there is the tendency of every living thing to produce a seed or germ. The powers necessary to accomplish this are very numerous and very complex, but all conspiring toward this one end, as if it were one of the purposes for which the plant was created. Secondly, there is the growth of the plant or animal from its embryo. This, too, implies an immense combination of arranged elements and forces. It looks excessively like an end contemplated, an idea to be realized. It looks all the more like this when we notice that the seed or germ is after its kind, and produces a new life of the same type.

I have endeavored to show in another work that in our world there is not only law and general government, but a particular providence accomplishing special ends.¹ The

¹Method of Divine Government, Part II.

laws produce general results, but they are also made to conspire and concur and cross each other, so as to produce individual events, which, as far as we know, follow no general law. This is manifest in every part of God's government, but is specially seen in God's dealings toward his intelligent and sensitive creatures. "A sparrow cannot fall to the ground without him." Thoughtful minds have ever felt comforted by the thought that there is a God watching over them, and ordering their lot from beginning to end, sending health or disease at the proper season, gratifying their wishes or thwarting them, according as may be for their best good. All this may be done by the persistence of force, but it is by a force guided by intelligence and love. When man accomplishes any end, it is by working on materials already prepared for him. But the God who created the materials has also arranged them for the accomplishment of his purposes. There is need of a power above evolution to account for the beneficence of evolution.

SECTION VII.

NEW POWERS APPEARING IN THE AGES.

I HAVE shown that in physical causation there is merely a changed state of the bodies acting as the causes. A and B act upon each other and constitute a cause, the effect being simply A' and B' in a new state with no new bodies, and no added energy, the energy in the two A and B being the same as in A' B' , with a portion in the one transferred to the other. In all such causation there is no energy in the effect which was not in the cause. If there be a new power appearing it must be superadded. But new powers have appeared.

For the purposes of my exposition, it is not necessary that I should determine what are the original bodies or powers in our world, what is their nature, and how many they are. They may be atoms, simple and indivisible, they may be molecules consisting of two or more atoms in union. These no doubt have all their powers by which they act.

Geology clearly reveals that new products have appeared. There was a time when there was no organism and no life, no plant or animal. But at a set time organized matter appeared, say protoplasm. When there was no animated being I believe that there was no sensation, pleasant or painful, and it certainly cannot be proven that there was any feeling in the protoplasm or in the plant. As ages roll on we have creatures evidently feeling pleasure and liable to pain. Organisms both in the vegetable and animal form rise higher and higher, and animals become possessed of impulses which prompt them to act in a certain way. We have now powers higher than the mechanical, we have the vital, the sensitive, and the beginning of the psychical. Hæckel divides the organic world into three kingdoms—the protista, the vegetable, and the animal. He traces twenty-two stages in the rise from the protista on to man, eight of them belonging to the invertebrate and fourteen to the vertebrates. I am not disposed to sanction this pedigree and every stage of it. But it is clear that there is such an advance. In the animal kingdom there is first sensation, then instinctive impulse, then lower rising to higher forms of intelligence, distinguishing things that differ, conducting long processes of reasoning and induction, and giving us glimpses of spiritual and eternal truth. Finally, we have a moral nature discerning between good and evil, laying obligations upon us to promote the happiness, and as higher, the moral

good of man, and pointing to a judgment-day. Naturalists may be tempted to overlook these last, the high ideas of which we are conscious; but these are realities, are facts revealed to the inner sense quite as clearly and as certainly as the visible and tangible molecular and molar parts, the seed, the limbs, the joints, the nerves and brain, revealed to the external senses.

Was there Life in the original atom, or molecule formed of the atoms? If not, how did it come in when the first plant appeared? Was there sensation in the original molecule? If not, what brought it in when the first animal had a feeling of pleasure or of pain? Was there mind in the first molecule, say a power of perceiving an object out of itself? Was there consciousness in the first molecule or monad—a consciousness of self? Was there a power of comparing or judging, of discerning things, of noting their agreements or differences? Had it a power of reasoning, of inferring the unseen from the seen, of the future from the past? Were there emotions in these first existences? say a hope of continued life or a fear of approaching death? Perhaps they had loving attachments to each other, perhaps they had some morality, say a sense of justice in keeping their own whirl, and allowing to others their rights and their place in this dance! Had they will at the beginning, and a power of choosing between pleasure and pain, between the evil and the good? Perhaps they had some piety, and paid worship of the silent sort to God!

It is needless to say that there is not even the semblance of a proof of there being any such capacities in the original atoms or force-centres. If so, how did they come in? Take one human capacity: how did consciousness come in? Herbert Spencer, the mightiest of them, would have us believe that he has answered the question, and yet he

has simply avoided it. In his "Psychology"¹ he is speaking of nerves for hundreds of pages; he shows that in their development there is a succession of a certain kind; and adds simply that "*there must arise a consciousness*"! This is all he condescends to say, bringing in no cause or link or connection. Thus does he slip over the gap—a practice not uncommon with this bold speculator.

It is pertinent to ask, How did these things come in? How did things without sensation come to have sensation? things without instinct to have instinct? creatures without memory to have memory? beings without intelligence to have intelligence? mere sentient existence to know the distinction between good and evil? I am sure that when these things appear, there is something not previously in the atom or molecule. All sober thinkers of the day admit that there is no evidence whatever in experience or in reason to show that matter can produce mind; that mechanical action can gender mental action; that chemical action can manufacture consciousness; that electric action can reason, or organic structure rise to the idea of the good and the holy. I argue according to reason and experience that we must call in a power above the original physical forces to produce such phenomena. I may admit that a body may come out of another body by the powers with which the bodies are endowed; but I say that a sensitive, intelligent, moral discerning soul cannot proceed from the elements of matter. New powers have undoubtedly come in when consciousness and understanding and will begin to act. They may come according to laws not yet discovered, but they are the laws of the Supreme Lawgiver.

It will be argued by some that there must have been all along in the atoms a latent life, sensation, consciousness,

and mind, with beneficence and capacity of choice, ready to be developed in the æons, some in thousands and some in millions of years. Those who deny that any new powers have appeared must resort to some such supposition. It may be allowed that this is a thing imaginable and possible, but there is not the semblance of a proof in its favor. Certainly there is no evidence that sentient beings could have passed through the intolerable heat of the star-dust from which our former worlds are supposed to have come. Even if we should discover proof of this, we should, in the very fact, have proof of design in the way in which these latent powers have come forth at the appropriate times, and continued ever afterward to operate in organized plants, in sentient animals, and in intelligent man. We have to choose our horn. If all the endowments now in our world were in primary molecules ready to come forth at the fit time, it is clear that they must have been the creature of an intelligence of inconceivable power. If they were not there, it is necessary to call in a subsequent creation, or at least some forthputting of Omnipotence.

Another supposition may be resorted to, somewhat more plausible, but still without any positive evidence. In water there are properties which do not appear in the elements oxygen and hydrogen. In organized matter there are powers which cannot be discovered in the components. It may be argued that in like manner at the appearances of new products there were conjunctions which produced life and feeling, consciousness and memory, intelligence and love. It may be safely said that proof is as much wanting here as in the other supposition. A necessity of thought founded on experience does indeed imply that there must be some extraordinary power called in to account for the extraordinary result which is beyond the potency of the common mundane agencies. But what this

power is we have really no means of knowing. It is certain that the power which has provided intelligence and conscience cannot be the ordinary mechanical or the chemical, or even the vital powers. These new powers imply, if not a creation, at least a providence.

The objects we are now looking at lie on the horizon of our vision and appear dim. We are constrained to call in a power to produce the effects, but whether it is to be regarded as natural or supernatural, we may not be able to say. God is working, but whether without or with secondary instrumentality we cannot determine. We may have come to a region where the difference between natural and supernatural disappears. We may have remarked that the Scriptures never mention such a distinction; they ascribe all to the will of God. The distinction may have an importance only in this lower and mundane sphere where we have worlds, but no experience of the creation of worlds. Faith and science may both be satisfied with our ascribing the whole process to a Divine Power, without dogmatizing as to how it has been acting.

Have we not, after all, the most satisfactory account of the process in the opening of our Scriptures? There is certainly a wonderful correspondence or parallelism between Genesis and geology, between the written record and the record in stone. We are to be on our guard indeed against straining either one or other to bring them into accord. The general agreement of the two is as obvious as it is wonderful. The only difference is that the one record is sensible, while the other is scientific. The one is the account of the scene as it would have appeared to a spectator then living; the other is the conclusion drawn from careful exploration.

That there is an accord between the Scriptures and science has been shown by the three men on this continent

who are most entitled to speak on the scientific question: Professor Dana, of Yale; Professor Dawson, of Montreal; and Dr. Guyot, of Princeton. Both testimonies give the same general account of the progression and of the order in which the powers appear. "Howbeit that was not first which is spiritual (*πνευματικόν*), but that which is natural (*ψυχικόν*), and afterward that which is spiritual." "And so it is written the first man was made a living soul; the second Adam was made a quickening spirit" (1 Cor. xv. 44-46), where we may mark the advancement from the merely living soul (*ψυχὴν ζῶσαν*) to the quickening spirit (*πνεῦμα ζωοποιόν*).

More particularly the book of Genesis represents the work as proceeding by *days*, which in every part of Scripture is employed to denote epochs; thus in chap. ii. 4, it is said, "In the day that the Lord God made the earth and the heavens." Regarding the days as epochs, there is a very remarkable parallelism between the order in Genesis and the order in geology, quite as much so as that between the stages in embryology and that in paleontology pointed out by Von Baer.¹ In the beginning or origin (*ἐν ἀρχῇ*) God created the heavens and the earth, and gave the original constituents their potencies which began to act. The earth was at first without form and void, with only the materials, or star dust, as Laplace's theory requires, the homogeneous state of Spencer. When the differentiation or evolution began there was in the first day light, as we might expect. In the second day came the expanse, that is, the sinking

¹ Mr. G. Romanes declares "that the order in which the flora and fauna are said by the Mosaic account to have appeared upon the earth corresponds with that which the theory of evolution requires and the evidence of geology proves" (Nature, August, 1881). Elsewhere he refers this to "traditional history." But there can be no traditional history of the production of plants and animals.

of the more solid materials and the elevation of the more ethereal. On the third day there was the separation of land and water, and plants were produced. On the fourth day the sun and moon appeared as distinct bodies, in accordance with the theory of Laplace. On the fifth day animals are brought forth—the lower creatures, tannim or swarmer, then fishes and fowls. On the sixth day the higher animals, reptiles and cattle, and as the crown of the whole, man, with qualities higher than all the other creatures, making him like unto God.

There are two accounts of the creation of man. One is in Genesis, chap. i. 26. There is council and decision: "Let us make man in our image." This applies to his soul or higher nature. The other account is in chap. ii. 7: "And the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul." This is man's organic body. We have a supplement to this, Psalm cxxxix. 15, 16: "My substance was not hid from thee, when I was made in secret, and curiously wrought in the lowest parts of the earth. Thine eyes did see my substance, being yet unperfect; and in thy book all my members were written, which in continuance were fashioned, when as yet there was none of them." This passage used to be quoted by Agassiz. This is my creed as to man's bodily organism. I so far understand what is said. Man is made of the earth. There is a curious preparatory process hinted at; a process and a progression going on I know not how long, and all is the work of God, and written in God's book. I understand this, and yet I do not understand it. Socrates said of the philosophy of Heraclitus that what he understood was so good that he was sure the rest would also be good if he understood it. So I say of this passage. I so far understand it, and get glorious glimpses of a divinely ordained

process, and yet I do not understand it, for it carries me into the secret things which belong unto the Lord our God. I affirm with confidence that there is not, in geological or biological science, any truth even apparently inconsistent with his statement.

I cannot say how man's body was formed. But the Scriptures evidently speak truly when they declare that it was formed out of previously existing materials—out of the dust of the ground. They also declare that God “breathed into his nostrils the breath of life, and he became a living soul.” As to his higher nature, it is said that he was made after the image of God. This must mean in knowledge of truth and in holiness. He cannot know all truth, but he knows of certain propositions, scientific and practical, that they are and must be true. He knows and appreciates the good and distinguishes between good and evil. This he does by the conscience, an essential part of his nature, represented by the tree of knowledge of good and evil. Both these qualities raise him high above the brutes, who have some discernment of things that differ, and a fear of pain and punishment, but have no idea of necessary truth or of the beauty of moral excellence. In all this there is a new power not produced by mechanical or animal agency.

SECTION VIII.

THE NEW POWERS WORKING WITH THE OLD.

WE have seen that in the ages new powers are introduced—powers of life, feeling, and intelligence—whether by natural or supernatural causes we may not be able to determine, because the operation takes place in a region

where it is difficult to say what is creative and what is creature action ; what is done by instruments and what without instruments—like the original creation out of nothing. When these new powers come they act upon, and they act with, the previously existing powers. The seed of the plant falls into the soil already formed, and works in it and with it. The sentient power, when animals appear, acts along with the mechanical energy in the bodily frame. It is the same when higher intelligence is introduced into animalism. The senses still work and supply information, which is received and formed into shape by the intellect. When the moral power begins to act it does not supersede the understanding, which tells us what things are, and upon this representation the conscience proceeds. These superadded powers seem to me to be all very much of the nature of seeds. They continue, and there is reciprocal action between them and their environment. They have life in them and they germinate and grow, influencing their surroundings ; and being swayed by them we have joint results which could not have been produced by either agent, and a development with vastly more varied potencies and of a more marked character, the new powers mixing with the old in the offspring, as they do in the parents. When the plant appears there is an interaction of the organic and inorganic powers, and we have development, in which both are combined, the growth of the plant and in due time its decay and dissolution, but with a seed left behind. When animals with sensation and will come forth we have now a more complex aggregate, still terminating in death, but with a new life in the offspring. The organic as the higher uses the inorganic powers and turns them to its own uses. When mind interposes it acts harmoniously with matter, and the soul and body act and interact, only the mind as the higher

subordinates the other. There is like joint and reciprocal agency as the mental powers rise higher and higher. The memory proceeds on the information given by the senses, and the understanding with its judgments and reasonings, and the conscience with its moral discernment and sentiments, presuppose and proceed upon both the senses and memory. The development now goes on under the new powers, but using all the old powers, and therefore with accumulated momentum. What is gained by any species goes down to the generation following.¹

As one of the issues the operations of nature are apt to go on in epochs, eras, or cycles. The organized causations pass through time like stage-coaches or omnibuses, which take in and give out passengers on to their journey's end. Thus, in animal life we have infancy, childhood, mature age, declining life, old age, and death. We have epochs in history, times in which there is a strong disposition to emigrate and form colonies, as when the Greeks, in the sixth century before Christ, spread themselves over many countries. We have seasons when the cry is for war among large bodies of people, ending perhaps in a demand for peace when the evils of war have been felt, and this continuing till it is needful to defend rights which are being trampled on. We have fashions not only in dress and in modes of social life, but in literature—the Byronic pe-

¹ Prof. Cope has remarked (*American Naturalist*, April, 1880) that the psychical powers modify and strengthen development. "In living things the powers display design, having direct reference to consciousness, to the satisfaction of pleasure and the avoidance of pains. Mind also controls structure: the evolution of mind has a corresponding effect on organism, a view which is confirmed by palæontology. The mind producing struggles of animals has led to machines for grinding, cutting, seizing, digging; for running, swimming, and flying. Man being defective as to these instruments, has been compelled to exercise caution and reflection, and has become restricted to peculiar modes of life."

riod or the Dickens period; and in art—the Raphaelites and pre-Raphaelites; in all of which, be it observed, there is a prevailing taste which continues for years. You could often tell at what age a book was written or an edifice built simply by inspecting its style and expression.

While there is an occasional degradation by reason of the want of fitting in the environment to the new life, there is upon the whole a progression. This arises mainly from the continuance of the new and higher powers introduced—say life, or intelligence, or conscience. These abide and go down by heredity, and as they act draw in, influence, and use the surroundings to produce new or higher aggregates. There results an advance upon the whole in the vegetable and animal kingdoms, in the soil, and it may be the climate. The progression is especially seen in man, with his intelligence and moral nature, which in spite of errors and sins, leads on to the employment for ends of many and varied powers, and these of a higher order. These ends are specially secured by the founding of hospitals for the diseased and the weak, and, above all, by the founding of schools and colleges for the cultivation and refining of man's higher nature; and the improvements go down by heredity from one age to another, when they raise up still nobler products.

SECTION IX.

SPIRITUAL POWERS.

WE have seen that there is an advance in the powers working in our world from the inanimate on to the organic, the sentient, the instinctive, the conscious, the intelligent, and the moral. I have sometimes thought that

in nature itself I can discover anticipations (I would almost call them predictions) of something higher to come. Agassiz was fond of finding prophecies of man's noble form in the frames of the lower animals. He erred, so I think, in not allowing sufficient influence to development. Professor Owen, too, was disposed to believe that the forms of the lower creatures pointed on to man as the archetype. Some of the views of these great thinkers as well as great comparative anatomists, may be somewhat antiquated, or at least reckoned so by our extreme evolutionists. But evolution, properly understood, does not even tend to set aside those ideals which our greatest naturalists have seen, and been elevated as they looked on them. But it may be doubted whether the natural man, the mere animal man, is the true ideal; say the selfish man, the lustful man, the deceitful man, the vindictive man. Every man is in a sense a moral man; he is possessed of a conscience discerning between good and evil, "accusing or else excusing." But our moral nature denounces much that we do, and claims to do so in the name and by the authority of God. Under this God we look for a rectification. This cannot be had in the conscience, which only condemns. Our moral nature points to a law of love, but shows no way of reaching it. In these circumstances we should not be indisposed to look round and inquire whether God, in following out his plan, may not super-add, as he has ever been superadding—some remedial measure, by which his own Idea (using the phrase in the Platonic sense) may be accomplished and realized.

The Scriptures announce clearly and emphatically that there has been an interposition and addition, and this not inconsistent with the original plan, but rather carrying it out. There is a new dispensation going beyond the old and animal ones, beyond even the intellectual and the

moral into the spiritual. God, who created man in his own image, has a means of restoring that image when it was lost. We are privileged to live under the dispensation of the Spirit. There were anticipations of his work under the Old Testament, in his working on individuals to convert and sanctify them. Still such operations were only partial and anticipatory. "For the Holy Ghost was not given, because Jesus was not yet glorified." But Jesus when on earth spake of the Spirit, which they that believe on him should receive. When he had finished his work of atonement for sin, and was taken up into heaven, the disciples waited for the accomplishment of the promise, which was fulfilled when the day of Pentecost was fully come, and the Spirit was poured out from on high. This Power continues to work in the church, and will extend its influence till the Spirit of the Lord is poured on all flesh.

Development now goes on under two potencies, the natural and the spiritual. There are the old powers still working—those of sense and understanding, of reason and of conscience. These constitute the life which God breathed into man when he became a living soul. They compose the higher reason made after the likeness of God, which sin has defaced, but which is deep down in our nature beneath the incrustations covering it from the sight, but which is capable of being restored. Upon these the new and spiritual powers work. Much that takes place is the joint result of the two. The inspiration of Moses, of the prophets and apostles, did not destroy their natural character, it only sanctified and elevated them. The spirits of the prophets were subject unto them. Religion does not eradicate the natural powers, it moulds and directs them to higher ends. The man's faculties and his temperament are not changed by his becoming pious; if he was lively

religion

before he will be lively still, if he was dull and solid he will continue so.

It should be noticed, however, that as the new powers come in there may be opposition offered by the old powers, and a contest ensues. Science tells us that in the animal ages there was "a struggle for existence and the survival of the fittest." There is a like struggle in the human period between the evil and the good. Some of our old theologians held that death was introduced among the lower animals by the sin of Adam. There is no such statement in the Scriptures, and geology shows that death has reigned all along in the animal kingdom. But there is a unity in our world in this respect as in others, that there has been a contest in all ages. In this world the seed of the serpent contends with the seed of the woman, and in the heart "the flesh lusteth against the spirit, and the spirit against the flesh." "The whole creation groaneth and travaileth together until now," but in the hope that the higher will conquer the lower, and that "the creation itself shall be delivered from the bondage of corruption into the glorious liberty of the children of God" (Rom. viii. 19).

The development goes on in eras or epochs like the ages of geology, like the days of Genesis. The patriarchal dispensation grows out of the antediluvian, the Jewish out of the patriarchal, the Christian out of the Jewish. We may discover marked epochs even in the Christian church: the time of the fathers—a time of establishing; the mediæval church—preserving like the winter the seeds deposited; the Reformation—bursting forth like the spring; the denominational churches—discussing doctrines and settling creeds; the missionary churches—carrying the truth to all lands, and about to expand into the millennial church.

Upon the whole, there is progression in the spiritual as

in the natural kingdom. Indeed many interesting correspondences may be traced between the two kingdoms. In both there are old powers and new working together and leading on to higher and higher products. The kingdom of heaven is like unto leaven, which a woman took and hid in three measures of meal, and which ferments there till the whole is leavened. It is a seed becoming a plant; there is first the blade, then the ear, and then the full corn in the ear.

There is a development in the revelation of truth. First there is the shadow and then the substance, there are first types and then the archetype. There are promises and then performances, predictions and then fulfilments. We know little of antediluvian times, but evidently there was then a light like that of the dawn. There were prefigurations in the Levitical institutions made after the pattern shown in the mount. There is higher ethical teaching in the New Testament than in the Old. The discourses of our Lord, who is the light of the world, shed a brighter light than had shone before, Greek or Jewish. There is the fullest revelation of doctrinal truth in the Epistles of Paul, of Peter, and of John.

We may discover this conjunction of powers in the writing of the Scriptures. Moses speaks, and David speaks, and Isaiah speaks, and Paul speaks, and John speaks; and we discover the natural temperament of each, and the influence of the age and circumstances in which they lived. But God too speaks: "Thus saith the Lord." All this is in analogy with God's mode of procedure. The "higher criticism," as it is called, may look at and search and even find fault with the human element, but let it beware of meddling with the Divine element. If it does so it will be seen in the end only to show its weakness and fallibility, by, it may be, casting out, though the critic may not see it,

something fitted to accomplish a good end. "All Scripture is given by inspiration of God, and is profitable for doctrine, for reproof, for correction, for instruction in righteousness, that the man of God may be perfect, thoroughly furnished unto all good works" (2 Tim. iii. 16).

Under this double influence the Christian grows. He "adds to his faith virtue; and to virtue knowledge; and to knowledge temperance; and to temperance patience; and to patience godliness; and to godliness brotherly kindness; and to brotherly kindness charity." Not that he is every instant advancing, but he is, upon the whole, progressing. He may have his periods of declension, but he rises above them. He is like a man ascending a high mountain; as he mounts up he may have to cross valleys deep and dark, but, upon the whole, he is rising higher and higher. The Christian dies like Samson, amid the glories of his strength, and slays in his death the last of his spiritual enemies. The church, too, extends. It is ever spreading into new countries, and it gives evidence that it will at last subdue all lands. Wherever it goes it carries with it innumerable blessings, in the lessening of human suffering, in improved legislation, in the promotion of education—lower and higher—and generally in the elevation of the race in knowledge and character.

Here it is interesting to notice the unity of the developed and developing history of our world. It does not take at first the form of a perfected world, but of a world going on toward perfection. It is not optimist, as Leibnitz painted it, but it is to become optimist. It has evil in it; but it is not pessimist, as Schopenhauer and von Hartmann represent it, going to the other extreme. As it is now going on it is a scene of contests, with defeats and victories through all its past history. It is a scene of contest from the beginning, of warring elements, of creatures suf-

fering who had not sinned "after the similitude of Adam's transgression." There is in it at this moment a contest between the evil and the good, like that between winter and spring, in which the spring, led on by the sun in the heavens, shall certainly prevail.

It is the most blessed of our privileges in this dispensation that every one who believes has access to God. There is a sense, indeed, in which God makes himself known to all his intelligent creatures, and "lighteth every man that cometh into the world." He does so in his ordinary providence, in which he brings events to pass according to causes which he has instituted, and in which he acts quite as certainly as if he produced everything without subordinate agency. (But earnest minds have never been satisfied with such distant views of God as are given by causation and consequent evolution. They aspire after and long for immediate intercourse with God. They pray in the belief that there is one to hear them, and they expect an answer. They will not allow themselves or others to think that God has so shut himself out from his own world that he cannot act in it and on it. They deny that our petitions are so bound to the earth by gravity that they cannot mount upward and reach the ear and the heart of our Heavenly Father who is felt as pitying them. They believe that their spirits can hold communion with God, who is a spirit, quite as certainly as our earth can act on the sun, and the sun on the earth. They have faith that there are wider and closer unions than the attraction of matter to matter. They are sure that all holy intelligences throughout the universe are in union with the holy God. Sure as we speak to God in faith God hears us. He speaks if we will but hear. "Truly our fellowship is with the Father, and with his Son Jesus Christ."

From this double power, natural and spiritual, arises the

difference in Christian experience and character. People have different natural inclinations, and are beset by different sins and temptations, and he suits his manifestation to their diversities. No Christian should insist that the work of God should be the same in the heart of every other as in his own. Nor should any one doubt of the reality of a spiritual work in himself because his experience is not the same as that of some others of whom he has read, or who may have opened up their feelings to him. Just as there is a diversity in the works of nature, in the color and form of plants and animals peopling the earth and ocean ; just as there is a variety in the shape and countenance of the bodily frames of men ; just as one star differeth from another, so Christians, while after one model, are made to take different types and hues of beauty on earth, and shall thus with their individualities be transplanted into heaven to adorn the paradise of God, and shine as stars in the firmament in heaven. In heaven the foundations of the wall of the city are garnished with all manner of precious stones, and the tree of life in the midst of the garden bears "twelve manner of fruits," so the saints will there have each his own character ; and the song which ascends will be a concert of diverse voices, each melodious, but each in its diversity joining with the others to make the harmony. Each in his own way will join in singing "the song of Moses and the Lamb."

SECTION X.

OVERSIGHTS IN SPENCER'S EVOLUTION.

It is of no use denying in our day the doctrine of evolution in the name of religion, or any other good cause. An age or two ago many religious people were afraid of geology. It can now be shown that it rather favors religion by its furnishing proofs of design, and by the wonderful parallelism between Genesis and geology. The time is at hand when all intelligent people, religious and irreligious, will perceive that there is nothing impious in development considered in itself; though it may be carried to excess and turned to atheistic purposes. The business of inquirers now is to explain its nature. This is what I have endeavored to do, to the best of my ability, in this little work. In doing this I have given an account different from that of Herbert Spencer. My work is a small one compared with his elaborate volumes. I do not purpose at the close of it to review his theory. In another number of this Series I propose examining his philosophy as culminated in his Ethics. I am here merely to show that I have set forth some truths not noticed by that powerful speculator, who is as remarkable for what he has overlooked as for what he has looked at. I think I have helped somewhat to clear up the subject by representing evolution as an organized causation. This requires us always to look for an adequate cause of the new product attributed to evolution. Mr. Spencer, and his follower Mr. Fiske, refer the whole to the Persistence of Force, as if there were only one power, and this apparently only mechanical or biological. But

there are other powers, or at least manifestations of power, of which we have as distinct evidence as we have of these. In particular there is a mental power, of which we are conscious, but at the peculiarities of which he has never looked, and which cannot be produced by any persistence of his forces.

It was charged against Locke by Leibnitz, and repeated by Cousin, that in constructing his theory—that all our ideas are derived from sensation and reflection—he did not begin with a careful introspection of the ideas themselves, and that, in fact, he overlooked the peculiarities of some of our most important ideas, such as infinity and moral good. A like charge may be brought against Spencer. As might be expected of one trained as an engineer, he is well acquainted with mechanical power, and has acquired a large knowledge of biology, some of his theories in which, however, as, for instance, his development of nervous forces, are not acknowledged by our highest authorities. But he seems to me to have never looked patiently, by the inner sense, at purely mental acts, such as consciousness, cognition, moral discernment, and will. “I believe that the experiences of utility, organized and consolidated through all past generations of the human race, have been producing corresponding nervous modifications, which, by continued transmission and accumulation, have become in us certain faculties of moral intuition.” Our moral intuitions are thus nervous modifications become hereditary.

He speaks often, as even the materialist does, of psychical acts. He thinks he has accounted for them by evolution. He has done so, simply overlooking their distinctive qualities as revealed by consciousness. He tries to evolve the conscious from the unconscious, thought from that which has no thought, and the moral from that which has no morality. He has thus in the effect what is not in the

cause. If we scrutinize his theory carefully, we shall find that what he accounts for is not properly psychical or mental operation, is not the consciousness of self, is not the feeling, the emotion, the reasoning, the resolution, the sentiment disclosed to the internal sense. The mind being merely an aggregate of nerves (he seems incapable of conceiving it as anything else) he can so far account for it by evolution. But when we look on mind as perceiving, judging, discerning between good and evil, we discover that he has not explained its rise by his evolution; he is not able to derive the rational from the irrational, or the good from that which has no moral perception. The fact is, his development is merely an evolution by the physical forces, not of the mental acts, but merely of their surroundings or the environment. These forces do have a powerful influence on the internal or psychical powers, not in producing them, but in directing them in certain channels. He thus believes himself, and makes it appear to others, that he is evolving consciousness and conscience when he is merely developing their accompaniments, and has never looked at anything else. Thus with all his zeal for development, he has never noticed seriously the grand results produced when psychical, and especially moral power, is joined with physical causation.

I know full well that exclusive physicists will look down with contempt upon my insisting on giving the higher intellectual and moral powers a place in evolution. But I hold these to be realities quite as much as bodies, with their energies and the motion they produce. It is not encouraging to the highest thought to find how few of those who have produced such a revolution in biology of late years have ever been trained in colleges or otherwise to consider purely mental phenomena. I do not regard their disposition to set aside these as a proof of the comprehensiveness of their

minds, but rather of their narrowness. For myself I have carefully tried never to allow my devotion to mental science to tempt me to neglect physical and physiological facts. I claim that never in my teaching or in my writings have I set myself against any discovery in natural science which has turned out to be true. Our naturalists would be elevated if, in looking at material agencies, they did not overlook mental, moral, and spiritual powers. The full-orbed truth is discerned only by those who go round it and look at all its sides. Thus only can the mind be open to all knowledge, and become expanded in any measure corresponding to the width of the universe disclosed to us.

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