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ARTICLE II.

THE LAW OF NATURE'S CONSTANCY SUBORDINATE
TO THE HIGHER LAW OF CHANGE.

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THE SUBJECT LAID OPEN.

THE constancy of nature has ever been a prominent article in the creed of the philosopher and the divine. Indeed all classes of men adopt it as an infallible truth. They read it in mathematical lines upon the cycles of the heavens, and nature's manifold operations around them seem usually to proceed in an invariable order. So certain are we that this is a great law of nature and that every effect in nature has a cause, that when any unusual phenomena occur, such as an aurora borealis or a shower of meteors, although no known law, perhaps, will explain them, men in civilized lands never think of calling them miraculous, and confidently expect that ere long they will be found to be a part of the course of nature and controlled by invariable laws. Indeed constancy is supposed to be the great law of nature that extends to all worlds and all events, and controls, and ever has controlled, all other laws. The only exception is that made by the believer in Christianity, who maintains that its miracles interfered with nature's established laws for a time, but that time has now gone by. It is getting, however, to be somewhat fashionable even for professed recipients of the Bible to regard the order of nature as so unalterably settled that the idea of its interruption by such an event as a miracle is absurd. Says a recent able writer, a renowned professor of geometry in an English university: "The enlarged critical inductive study of the natural world cannot but tend powerfully to evince the inconceivableness of imagined interruptions of natural order or supposed suspensions of the laws of matter, and of that vast

series of dependent causation which constitutes the legitimate field for the investigation of science, whose constancy is the sole warrant for its generalizations, while it forms the substantial basis for the grand conclusions of natural theology." ¹ Again, the same writer says: "In nature and from nature, by science and by reason, we neither have, nor can possibly have, any evidence of a Deity working miracles; for that we must go out of nature and beyond reason." ²

But is this a true representation of the course of nature? We take different ground. When we study the manner in which the different laws by which events are brought about operate, when in antagonism with one another, as they usually are, and especially when we study the early geological history of life on the globe, we are forced to ascribe a mightier influence to the law of change than to constancy. We shall endeavor to maintain the following position:

The law of nature's constancy is subordinate to the higher law of change.

PRELIMINARY DEFINITIONS.

Preliminary to a presentation of the evidence on which this proposition rests, it may be desirable to define a few of the terms employed, that there may be no mistake as to our meaning.

Natural law is a power by which the same causes, both in the world of matter and of mind, invariably produce the same effects in the same circumstances, and the result is a settled and uniform course of events.

Some suppose that this power has been communicated to nature in the beginning, and is inherent in matter and mind, always operating invariably. Others suppose that the power lies in the will of God, and that a law of nature is merely the mode in which the Deity acts upon the universe. We prefer this latter view; first, because of its

¹ Powell on the Study of the Evidences of Christianity, *Essays*, etc., p. 124.

² *Essays and Reviews*, p. 159.

simplicity ; secondly, because we cannot conceive how any self-executing power can be imparted to a law independent of the agency of the law-giver ; thirdly, because to suppose such a power inherent in nature, effectually removes God from his works as a personal agent, and indeed renders his existence unnecessary.

The law of miracles is a force occasionally manifesting itself to counteract, intensify, or diminish the power of natural law : To counteract, as when a Lazarus was raised to life, or the waters of the Red sea formed a double wall ; to intensify, as at the deluge it rained forty days, or as a strong east wind laid bare the bottom of the Red sea ; to diminish, as when Christ stilled the boisterous winds and waves of the sea of Galilee. This law, also, is invariable ; that is, in the same circumstances the same miracle will occur. But in its action it contravenes natural law, and can thus be distinguished from it ; and as it is introduced only occasionally, and to subserve some important purpose, it is rightly regarded as a special interposition on the part of the Deity. Moreover, though a law, we cannot understand its nature.

There is considerable diversity of views in the definitions given of supernatural events by the ablest theological writers. Dr. M'Cosh, the eminent Scotch writer, says : " we would confine the word 'miracle' to those events which were wrought in our world as a sign or proof of God making a supernatural revelation to man ; to those signs, wonders, and miracles which were wrought by Moses and the prophets, by Jesus Christ and the apostles," etc. " We must even view creation as supernatural, but we do not speak of it as miraculous."¹

We should feel no great objection to such a distinction, provided all would agree in limiting supernatural events to those special interventions on the part of God that are independent of nature and entirely inexplicable by its laws. Even Dr. M'Cosh does not find it " needful for his pur-

¹ *The Supernatural, etc.*, pp. 146, 147.

pose," although writing "on the supernatural in relation to the natural," "to take any side in the controversy," whether the new creations of animals and plants made known by geology, including man of course, "can be accounted for by natural causes still operating," or "from natural causes undiscovered," or "from a supernatural power called in at once." So that, although he calls these new creations "supernatural," after all, they may turn out to be natural, although we and many others regard them as the highest and grandest exercise of special divine intervention of which there is any knowledge, and hence we want them designated by an unambiguous term.

Another fact shows how ambiguous the term "supernatural" is. Dr. Bushnell of this country, in his able work on "Nature and the Supernatural," brings all the acts of the human will into the latter class. "It is only the will," says he, "that is not under the law of cause and effect." "The very idea of our personality is that of a being not under the law of cause and effect, a being supernatural." "We ourselves, then, are supernatural agents." Now whatever be the truth of these views, the facts are certainly very different from what we would include under the term "miracles," and by using this term with the definition we give to it, we avoid the uncertainty of meaning that rests upon supernatural."

Dr. M'Cosh, also, objects to the idea that miracles are under the control of law. "It would be most presumptuous in us," he says, "to affirm that we can in every case discover the law to which the supernatural operations belong, or so much as be sure that there is a law. It is quite conceivable, indeed, that there may be some such law beyond our ken, but of what use can it be to appeal to a law unknown and unknowable? It is quite as conceivable that God may have wrought in our world an isolated occurrence, having no connection, physical, casual, or dependent, with any other mundane occurrence, except the profound relations which all things have to one another in the divine mind." Yet Dr. M'Cosh maintains that in the supernatural

dispensations of God "there is a grand system with subordinate systems," and that "all that God does must fall out according to a purpose in the divine mind," and according to "an order and a method." "There is evidently a rule in the divine mind, according to which miraculous interferences take place."

Now if God acts in miracles according to a "system" and a "purpose," and by "a rule" and "an order and a method," we cannot see why he does not act according to law; so that in the same circumstances he will do the same things; and uniformity of action is what we mean by law. We may not understand the law at all, and it may be independent of cosmical arrangements; yet, as we think Dr. Bushnell has clearly shown, we can prove its existence. By its very nature, also, it contravenes or modifies natural laws.

We should regret to be thought to differ much from the admirable views presented by Dr. McCosh in his work on the supernatural, when in fact we do not, save in terms, except in his hesitancy to ascribe the geological creations to special creative power.

A special providence is an event brought about apparently by natural laws, yet by such a previous arrangement of second causes, or, when necessary, such a modification of them out of our sight, as to produce a special end. It differs from miraculous providence in exhibiting no apparent counteraction or increased or diminished intensity of natural laws. It differs from common providence in showing a designed conspiracy of causes to meet a particular exigency. Yet events that seem to us merely incidental, could we see all their antecedents, might show such a conspiracy, and hence it is not easy to draw the line between special and common providence. Practically it is sufficient to regard all events as special providences where we can see evidence of any special arrangement to meet an exigency in the condition of organic beings.

The wise and striking adaption of parts and operations in nature, which are so common, differs from special provi-

dence as the means differ from the end. Special providence is an end, which always terminates in organic beings. Adaptations are the chief means by which those ends are secured. But this idea of selection or discrimination enters into that of special providence, implying something done for an individual, a community, or a race, that is not done for all; and done, too, under the direction of the Supreme Ruler over all. Adaptation shows no such discrimination, but merely a wise arrangement of natural laws and operations to secure the general harmony and well-being of the universe. Special providence directs these adaptations from the general current into side channels, and by conspiracy and otherwise causes them to meet particular exigencies.

The views above expressed as to special providence seem to us to correspond, essentially, to the notions entertained by Christians generally. But standard theological writers vary widely in their definitions of this phrase. One calls the providence of God "over the human family, special," and that "over persons distinguished for virtue, most special" (Storr and Flatt). Another calls that providence special "which relates to the church" (Buck's Theol. Dict.). Another, when "it relates to moral beings, to men and human affairs" (Knapp). We are glad, however, to find our views sustained by some eminent authorities. "In nature," says M'Cosh, "there is a special providence; for while God has so arranged his physical agents that general laws everywhere prevail, and prevail for the good of man, he has also so disposed them that by their combination or coincidence, crossing or collision, they produce individual incidents, which exercise a mighty influence on the world at large, or which meet the state and wants of individual men at momentous or critical times in their history."¹ "Special providence," says Professor Park, according to the notebook of one of his pupils, "consists, not in an interposition by God, but in such a control over events as secures phenomena when fitted to arrest attention by their peculiar and

¹ The Supernatural, etc., p. 60.

striking adaptation to a moral design." It greatly encourages us to find our views coincident with those of such men on this important subject.

The law of change is a force sometimes manifesting itself in nature, by which its constancy and uniformity are modified. Its manifestations are made both through nature's ordinary laws and those of special intervention or miracles.

The normal operation of the law of change is effected through ordinary laws. But in order to produce change there must be interference or antagonism between them. The change is the resultant of these conflicting forces, and often the action is too complicated for human calculation to reduce to formulae.

The abnormal operation of the law of change depends upon special divine interposition. In this case the law of change is synonymous with that of miracles.

LAWS CONTROLLING THE COSMOS.

Let us now pass in review the principal laws by which the universe is governed in their relations to constancy and uniformity as well as to change. We can then judge which are the controlling and which the subordinate laws. These laws are all embraced in five classes: 1. Mechanical; 2. Chemical; 3. Organic; 4. Intellectual; 5. The law of Miracles. All these laws, except perhaps that of miracles, can be appealed to for examples of constancy and uniformity, as well as of change.

Mechanical Laws.

1. Take first the mechanical laws. These are most manifest in the great movements of the universe, and have been discovered and elucidated by such men as Kepler, Newton, La Place, and a multitude besides, almost equally eminent. They have been reduced to three: the centripetal, the centrifugal, and the repellant. The first two produce the annual and diurnal revolutions of the earth and the heavenly

bodies, and most of the other celestial phenomena, such as eclipses, transits, and occultations. The phenomena which these laws produce make the most powerful impression upon our minds of all nature's operations in favor of its constancy and uniformity. Periodicity is the lesson which they almost universally teach, even though some of the phenomena have a wide isolation. Yet so generally do we find the same facts recurring at regular intervals, or in cycles, that none but the most ignorant and superstitious pronounce the most unusual appearances miraculous, but expect rather that after a time they will fall under some fixed law. For thus far, in the world's history, such has always been the issue.

Repulsion, being antagonistic to attraction, manifests itself, perhaps always, as a means of change; but it is normal change. The two most striking examples to common observation are, the violent movements of the atmosphere and the production of the immense trains that are formed behind comets as they approach the sun. Yet the limits of both these phenomena seem to be fixed. They are no wider now, either in comets or atmospheric disturbances, than they were thousands of years ago. We hence infer that the force is under the control of fixed law. But on this point we shall have occasion to speak again.

As already observed, probably our strongest convictions of nature's constancy and regularity are derived from the usual phenomena of the celestial motions under the control of gravity and a centrifugal force. Nevertheless, these forces sometimes present a phase of action which is a remarkable example of the influence of change. The heavenly bodies must of course act upon one another and disturb one another's motions. But the effect is too feeble to arrest common observation, and demands for its full elucidation, not only accurate instruments, but long periods of time. And after the existence of these disturbances had been ascertained, even astronomers misapprehended their nature. Thus it was found that the moon's orbit is slowly

diminishing in size, and hence it was predicted that ere long that body would fall to the earth. So a slight diminution of the obliquity of the ecliptic to the equator was supposed to portend a final coincidence between the two circles, and consequently an end to all change of seasons. But it is now known that these minute changes occur in cycles or oscillations about a mean state; so that after increasing for a time, it may be for hundreds or thousands of years, the disturbing motion decreases, and continues forever to oscillate from one extreme to another. Already it is ascertained that the motion of the moon is affected by more than forty of these deviations from a normal state, and double that number probably exist.

What, now, is the ultimate effect of these numerous and ceaseless disturbances upon the regularity and permanency of the celestial motions? Precisely the reverse of what we might expect. From their long continued action we should naturally predict the ruin of the system, as in fact the earlier astronomers did anticipate. But when it was discovered that the perturbations were cyclical, the mathematicians were able to demonstrate that they would secure the permanence of any system like the solar, where the bodies move nearly in circles, and in the same direction, and in orbits but little inclined to one another. Hence the paradoxical statement becomes true, that the instability of such a system secures its eternal stability, if no other disturbing force interfere. Change is thus made the means of infallible constancy in the celestial revolutions.

But is there not another disturbing force manifest in the celestial mechanism? Certainly we may say that glimpses of such a force do appear. Certain of the periodical comets exhibit, at their successive returns, such an acceleration of their revolutions, as is most reasonably explained by the existence of a resisting medium in their paths. For such a resistance would give the centripetal force an advantage over the centrifugal, and thus reduce the size of the orbit, so as to shorten the time of revolution, even though it

retarded the motion. One of the comets, from this cause, has already shortened its time of revolution about two days, and advanced ten days on its orbit since the period of its discovery. At this rate it would fall into the sun in about thirty thousand years. The effect of such a medium on the solid planets would be vastly less than upon the thin vapor of a comet; but however slight, time enough being given, they too would find the end of their spiral journey in the sun, and the whole system would come to ruin in spite of the conservative influence of the cyclical perturbation already considered.

We know that some astronomers have doubted the existence of this disturbing and destroying medium. But we fancy that they doubt it more because it does not agree with their hypotheses than from want of evidence. Admitting its existence, and the ultimate ruin of the solar, if not the whole sidereal, system can be prevented only in two ways; one is by the existence of some hitherto undiscovered agency to counteract the influence of a resisting medium. Such counteracting forces do indeed exist in nature; but in this case, not the slightest evidence of their presence or operation occurs. Indeed it is difficult to understand how such a tendency to ruin could be counteracted by any natural process. Divine interposition alone, we apprehend, could do it; and this is the second, and we judge the only way, in which ultimate ruin can be averted from the present material system, if there be no mistake as to the existence of a resisting medium in space. And who knows but it may be a law of the divine government, that particular systems of nature should come to an end after having subserved the purposes for which they were created? We shall shortly see that the early history of this earth gives us an account of several minor systems of this sort, which have disappeared and been succeeded by others. Why may not similar changes have occurred among extra-terrestrial economies?

While, therefore, the mechanical laws of the universe

furnish the most striking examples of nature's constancy and uniformity, they show us a higher law of change controlling that of constancy, and acting as a great conservative principle so long as perpetuity is desirable; yet we obtain glimpses, also, of another law of change that demands special divine interposition to arrest its destructive operation, or to introduce a new system after the old one has been destroyed. And surely in such an exigency we may say *dignus vindice nodus*.

Chemical Laws.

2. We pass, next, to a consideration of chemical laws, including those of light, heat, and electricity, because in general these are indispensable agents in chemical changes. Chemical operations, as a general fact, are the result of the opposing forces of attraction and repulsion. Affinity and cohesion are the attracting forces, while heat and the polarities of electricity produce repellancy. The former would bind the particles immovably together; the latter push them farther and farther asunder. But their joint action produces incessant change. Every animal and every plant is a busy laboratory. Chemistry is at work in the atmosphere. Not even the deep-seated rocks escape its metamorphic power. Nay, from the circumference to the centre of vast worlds, we have evidence of chemical action, producing mighty and entire revolutions. Yet most of this work is silent and unseen.

The result of this all-pervading agency is change; change not only among infinitesimal atoms, but throughout the mass of entire worlds. There is not probably an ounce of rock in the entire crust of the globe that has not undergone metamorphosis; nay, much of it has been repeatedly changed. The sound crystalline aspect of the deep-seated rocks, as we break them open, is no evidence that chemical metamorphosis has not passed through them all. Even geologists can yet scarcely realize the extent of these transformations as stubborn facts compel them to admit. And

this work is now going on everywhere, unseen and silent indeed, but surely and triumphantly, as the future will reveal. Of all things on this globe the solid rocks are the most changeable. The ocean, save in its mechanical movements, is comparatively permanent and unchanging; and the same is true of the atmosphere. But the rocks are ever in a state of flux.

If we extend our views beyond the earth, yet keeping its early history in mind, we shall find evidence that the great bodies of the cosmos are passing through a series of chemical changes. Some, as the nebulae and the comets, are in a gaseous condition, apparently from the effects of intense heat. Others, such as the sun and the planets exterior to Mars, are in a liquid condition; either in that of melted globes, or covered by a fluid like water. Others are in a solid condition, as Mars, the earth, Venus, Mercury, and the asteroids; having been apparently cooled down from a molten to a solid state; of which the moon furnishes a notable example. Now the history of the earth presents us with unequivocal evidence that it was once in a liquid condition from heat, and has within it still a vast incandescent ocean. We can trace back the earth's history with certainty to the state of a melted globe, and there is a strong presumption that at an earlier date the heat may have been intense enough to convert it into gas.

By thus comparing the condition of the cosmos at present with the earth's early history, we catch a glimpse of a great principle of chemical change, to which the bodies of the solar system, and probably of all systems, are subject. The earliest state is gaseous; they then pass into a liquid condition, and then become solid. Now if we knew of any mode in which a solid world could be converted into gas, as one of the phenomena of nature, we should make out a complete cycle of change among the spheres of the cosmos. But no glimpse of such a transition shows itself in nature. The cycle then is incomplete or broken; and we must conclude, either that when a planet has reached a solid state it

will forever remain so, or that any future change will require a special divine interposition. Almost all the analogies of the universe make future changes in its physical condition probable, and therefore the first supposition improbable. But we trust, ere we finish our argument, to show that many exigencies in the earth's history, many a *dignus vindice nodus*, have demanded and witnessed special divine interference. This may be one of them, and so is it represented in relation to this world, as we understand it, in the Bible. No law of nature, surely, can explain the earth's future destruction and renovation. For though there may be forces within the globe adequate in certain circumstances to destroy it, yet whence can the new earth originate, unless, as represented in the scriptures it "come down from God out of heaven"?

Atmospheric Changes.

We have deferred thus far making but slight allusion to atmospheric phenomena, because though in part dependent upon mechanical forces, chemical agencies are still more concerned, and electrical as well as optical influences often indispensable. We find here the elastic force of the atmosphere struggling against the compressing power of gravity; the perpetual struggles between heat and cold; the rush of cold and heavy air to restore the equilibrium with that which has been heated and rarified; the evaporation in one place and the condensation in another, of water by chemical and electrical agencies; and finally the influence of light upon the phenomena of clouds and the colors of plants and animals. When we reflect that the atmospheric phenomena are the result of so many conflicting and ever-varying forces, it is not strange, surely, that no mathematical formulæ can be formed that will tell us what that resultant is. Though we fancy that a solution of the problem by which the weather could be predicted, would be extremely desirable, we suspect that it was intentionally placed beyond the grasp of terrestrial mathematics.

Man's inability to work out this problem, however, does not result from any inconstancy or uncertainty in the action of the forces concerned. And the same is true in respect to all those chemical operations we have been considering. In its individual action each of these laws has all the certainty of mathematics, and we could calculate precisely its amount if it operated alone. But when numerous forces come into play, some of them in conflict and some in harmony, and the exact value of each cannot be known, no skill in calculation can reach a satisfactory result. Long observation, however, does enable a man to form an approximate estimate of the coming changes in nature that depend upon the complicated causes, mechanical, chemical, and electrical, that have been enumerated. Hence we may be certain that the apparently irregular play of the forces concerned is confined within fixed limits, and that chemical agencies and atmospheric changes are oscillatory or cyclical. It is possible, indeed, when the data have been reached by long and patient observation, that even the problem of the weather and of the seasons may be solved by the meteorologist. We know enough at present to be sure that all the forces concerned are controlled by laws as fixed and constant as those that produce the annual and diurnal revolutions of the earth.

If such be the case, how, it may be asked, are chemical or even atmospheric changes any exception to nature's constancy and uniformity? In a certain sense, indeed, every operation dependent upon unchangeable law is constant; that is, in like circumstances the same process will be repeated. In this sense, not only every natural event but even miracles are constant, for we believe them all subject to law. But those laws may be so arranged as to antagonize, diminish, or intensify one another, and then change, it may be entire change, is inevitable. When produced by natural laws, we have called it normal; when by miracles, abnormal. All the mechanical and chemical changes which we have pointed out belong to the former

class. The ample record of these events furnishes no example of a miracle; though in a few instances it does show us exigencies where miraculous interposition seems indispensable to save the system from destruction.

Natural changes, then, are consistent with fixed laws. Still more obviously so are constancy and uniformity. But the main question we would raise is: Which of these is the higher or controlling law? Constancy is certainly the most obvious result of mechanical laws. Yet it does not follow from hence that constancy is not controlled by change. And when we see how the latter secures the permanence of the celestial motions, we can hardly hesitate to give it the pre-eminence over the former. Still more manifest is it in the operation of chemical laws, that change takes the precedence. Indeed this is the almost exclusive manifestation of those laws in nature. The disintegration and metamorphism of the rocks remind us of change, not of constancy. So do the growth and decay of animals and plants. So do atmospheric phenomena, which are the joint action of mechanical, chemical, and electrical laws. In all these cases change is not only the higher law, but it is only by reasoning that we satisfy ourselves that there is constancy in the changes.

Organic Laws.

3. But the most important proof and illustration of the subordination of constancy to change in nature we hope to derive from organic laws; which, as a third branch of the discussion, we proceed to consider.

Organic laws embrace the commencement, development, and extinction of the various systems of life that have appeared on the globe. It will be convenient to speak, first, of the system which is now manifesting itself in existing animals and plants.

Perhaps we have already said enough as to the chemical and electrical operations connected with organism. They are abundant and incessant in every animal and in every

plant, and the result is unceasing change,—change of internal and external development, of form and size, and finally the changes of decay and decomposition. The principle of life does indeed accelerate or retard, or otherwise modify, these changes; but the vital as well as chemical and electrical forces concerned are all governed by fixed laws, and therefore the changes are normal; their limits are fixed, and though not periodical, they are so analogous in different individuals, as to show them invariable in their operation in the same circumstances. Should we turn the kaleidoscope for months, and never see the same figure recur, we should not hence infer that the permutation and combinations of that instrument were not regulated by invariable laws, but only that its possible modifications were beyond all human calculation. There is no more reason for excluding from the control of law the no less numerous aspects in which the phenomena of life present themselves. Ceaseless, and often apparently causeless, change is, indeed, about the only external manifestation of the phenomena; but we never doubt that for every new feature there is a fixed cause. In this sense there is constancy, but change predominates overwhelmingly. But what shall we say of that system of reproduction by which the races of animals and plants are continued in existence? Is it balanced by the system of death? Most certainly; for death is universal, and whether the number born be small or great, they pass away. But though the individuals die, the species, the family, the race, survive. A few examples can, indeed, be quoted in which species seem to have perished, in recent times, such as the *Dinornis*, the *Aepyornis*, and the *Dodo* of Mauritius, and a still larger number of the extinction of particular species in particular countries. Whether the disappearance of ever so small a number of species may not so disturb the balance of nature as to carry serious disorder through the whole system, is a question we have not time here to discuss. But the almost universal permanence of species, amid the universal destruction of individuals, is

another good example of constancy in the midst of endless change.

Early Systems of Life.

We have spoken of other systems of life on the globe before the present. They have been numerous, and have left the record of their existence and character in the rocks. The question is, whether the same laws of anatomy, physiology, and botany which now prevail, have always controlled the reproduction, sustenance, and decay of animals and plants; or has each new system of organism had new laws? All the records of the past afford evidence of the identity of these laws in all past periods. Hence the endless changes, within fixed limits, which we witness in the present system of life have been manifested in all previous systems.

But though the laws have been the same in these successive economies of life, not so the character of the animals and plants. Each of the great geological formations has been characterized by peculiar groups, found neither in the rocks below nor above. They belong, indeed, to the same great classes which extend through all the formations. But when we examine the smaller groups, we find sometimes new orders or families, more often new genera, and most often of all new species, introduced with each new rock; so that each formation has its peculiar and characteristic animals and plants. Some have maintained that the new species have been introduced one by one, towards the close of each formation, to take the place of species that drop out one by one, so that the entire change is gradual, and we could not tell from the fossils exactly where to draw the line between the two formations. But the ablest paleontologists make an entirely different representation. They admit, indeed, that in a few cases there is some commingling of species for a short distance from the junction of two formations. But this is reasonably explained by supposing that the catastrophe, or whatever cause terminated the general system of life in the inferior formation, might not

have been sufficient to destroy some of the more hardy species, which therefore continued to live on in connection with the newly-created species. Professor Pictet thus enunciates the general principle: "Contemporaneous species of the same locality, or contiguous localities, in an immense majority of cases, have disappeared and appeared together. Sometimes we see a non-fossiliferous bed between two formations; but we never find, or almost never, a deposit containing at the same time, and in a normal condition, fossils of the bed beneath mingled with those of the bed above. The species born together, and having lived together, have ordinarily disappeared together."¹ "It results from these facts," says M. Alcide D'Orbigny, another eminent paleontologist, "of which all the world affords evidence at all the geological epochs, that each of the stages that have succeeded one another on the globe has had its peculiar fauna, well-marked and distinct from the faunas below and above, and that these faunas have not succeeded one another by change of form, or by gradual replacement, but by sudden destruction. We meet nowhere, indeed, a transition of one specific form into another at the contact of two successive periods; but the organisms on the surface of the globe have succeeded one another, not by modification of animal forms in the passage, but rather by the extinction of existing species and the renewal of species at each geological period."²

These writers impute the destruction of the successive faunas and floras to the disturbances that have taken place in the earth's crust. Says D'Orbigny: "We have seen that every time in the earth's history when there has been a dislocation of the crust, capable of producing a great displacement of the seas, the existing fauna has been destroyed by the prolonged movement of the waters at the dislocated points, and even elsewhere; that the separation of distinct and successive faunas which we find in each formation or

¹ *Traits de Paléontologie*, Tome I. p. 44.

² *Cours Elementaire de Paléontologie*, Tome II. p. 252.

geological stage, is therefore but the visible consequence of dislocations of various magnitude, which the consolidated crust of the globe has undergone in every part."¹

Other distinguished geologists and paleontologists do not admit such an entire correspondence between catastrophes and the extinction of faunas, which they suppose has taken place gradually, especially among the higher races, by the slow changes which have occurred in the condition of the surface, as to climate and food.

We are persuaded that the truth lies between these extremes of opinion. We are certain, from stratigraphical geology alone, that great disturbances in the earth's crust took place at the close of many of the periods of deposition corresponding to the formations. They were such dislocations as must have destroyed life over wide surfaces, if not over the whole globe, as is evident when we look at the great discordance of dip and strike between consecutive members of the older formations. In such cases there must have been a sudden disappearance of the old faunas and floras, and those which succeeded must have been new. But in some other cases the new races seem to have been introduced without much disturbance, and we should expect that many of the old species would be continued and mixed with the new ones. For a striking example we refer to the alluvial period.

There is no geological evidence that any great disturbance preceded the introduction of the existing races upon the earth, although it is the most extensive and perfect of all the systems of life that have appeared. None of the living species are found buried more than a hundred feet in depth except a few species that reach back certainly as far as the tertiary. Hence we place the commencement of the Historic Period only so far back as that hundred feet implies, though the whole thickness of the alluvium cannot be less, probably it is more, than five hundred feet. The great delicacy and complexity of the existing races would not

¹ Cours Elementaire de Paléontologie, Tome II. p. 253.

perhaps have been consistent with much disturbance just before their introduction, and therefore the surface had been kept comparatively quiet ever since the Cretaceous Period. The new races, especially man, demanded long preparation for their accommodation. And it accords with what the whole history of the earth teaches us of divine wisdom and benevolence, to suppose that the requisites for their full development and happiness should be provided.

It is to the alluvial or pleistocene formation that Sir Charles Lyell chiefly appeals to sustain the doctrine that species have not appeared and disappeared together and suddenly at the beginning and close of each formation, but have dropped out and been replaced by others at intervals through the whole period of deposition, and hence he infers that between the older formations, where the consecutive deposits are totally unlike in fossil character, there was probably a wide interval during which no rocks were laid down in the spot observed, though in other regions formations were accumulating.

It is true that the fossils of alluvium, and more or less those of the tertiary, might give plausibility to such a supposition. For it is not easy to fix upon the precise period when the existing races were introduced. Yet if we admit on inspired authority that they were generally the contemporaries of man, all those whose remains occur deeper than his in the formation must be supposed to have been created at an earlier epoch, and to have survived whatever catastrophe might have immediately preceded his creation. This would make quite a large number of the existing species pre-Adamic. But what is there, either in scripture or observation, to make such a statement improbable? The former represents large numbers of animals and plants as created on the third, fifth, and sixth demiurgic days; that is, as we understand the history, they were essentially man's contemporaries. But the Bible does not say that no species of previous creations were still living; or, more probably, it intends to include in its history

all of every period, making those alive with Adam the representatives or models. What matter, then, though many species had an earlier origin than the Adamic creation? They are all included in the Mosaic account, and it was not necessary to inform us that some species are the survivors of an anterior creation.

In these statements we can see a reason why more species are common to the Adamic creation and two or three others that preceded it, as low as the eocene tertiary, than in respect to any of the earlier demiurgic periods. The world had reached a more statical or settled condition, and catastrophes were less frequent and violent, and not as destructive to organic life. Hence not a few species were able to survive them, so that, in the opinion of most paleontologists, some existing species began their race as long ago as the eocene tertiary. But we are not justified in making these facts as to the latest creations a standard for the earlier ones, because we have evidence in the lithological character and unconformable position of the latter that they have been subject to such agencies and catastrophes as might have entirely destroyed life. Hence it is unphilosophical to interpolate between such formations periods of respite from the work of deposition in particular places long enough to connect the fossils in other localities into an uninterrupted series, as between the Adamic and more recent pre-Adamic formations. Circumstances are so changed in the modern periods, that we cannot safely make them a standard by which to judge of earlier economies.

Moreover, the evidence relied on to prove that in the present economy of life species are continually dropping out and new ones introduced, so that the whole system may in this way be changed, seems to us entirely insufficient. All we can show is, that a few species of birds and quadrupeds, having a limited range, have become extinct chiefly through man's agency; but not a single example has ever been found of the introduction of a new species. The law which

we find almost everywhere dominant is, that species are persistent and permanent, while the few cases of extinction may probably all be explained by local circumstances. The fair conclusion is, that probably the species of the historic period, like those of all previous periods, will live on together till the will of Providence causes them to perish together. Yet, for the reasons already given, a larger number may survive and pass into another life-period, should another analogous to the present succeed. But surely its history thus far does not authorize the conclusion that a law of nature is dropping out some species and introducing others, so as finally to change the whole. Much less can we infer from what is now passing that all past life-periods have, in like manner, graduated into each other insensibly, and not by sudden transition.

But even should we admit these uniformitarian views—this slow transition of one life-period into another—the essential fact, so far as religion is concerned, would still remain, viz. that the species in different formations are unlike, and the new ones, whether introduced together or singly, whether constituting the entire fauna and flora, or only a small part of them, would equally demand the interposition of divine creating power. If, for instance, man were the only new species in the alluvial period, in no way but by resorting to absurd hypotheses, could we account for his introduction without an infinite Creator.

It is well known that a great deal is said, at this day, about recent discoveries which indicate a great antiquity to the human species, from the remains of man found in caves in Belgium, England, and the south of France, and flint instruments found in the gravel deposits of the Somme and elsewhere, with the bones of extinct mammoths and the woolly rhinoceros. The discussion has brought out numerous publications, the two most important of which are "The Geological Evidences of the Antiquity of Man," by Sir Charles Lyell, and the "Pre-historic Man," by Professor Daniel Wilson of Toronto. Admitting the facts to be cor-

rectly understood, of which there is great reason to doubt,¹ the facts we have detailed show us a very plausible explanation of the admixture of human remains with those of extinct animals, without resorting to extreme antiquity. *For we do not know when the fossil species became extinct, and we do know that some of them were alive at a quite late period.* There are other modes of meeting the difficulty; but this is perhaps the most probable.

Tabular Illustration.

The important bearing of the facts that have been briefly described, upon the subject under discussion, has led us to construct the adjoining tabular illustration of the successive systems of life that have appeared on the globe. Their thickness, as thus far ascertained, has been laid off from a scale, chiefly to show how much thicker were the earlier than the more recent systems, and how that thickness has gradually decreased.

Our diagram represents these life-systems according to two plans of arrangement. In the left hand column, the rocks are divided into groups so large, that with the exception of the Alluvial and the Tertiary, no species is common to any two of them.

The lowest or Paleozoic system is 47,600 feet thick, or more than nine miles. This vast group is characterized by the entire absence of birds and mammiferous animals; also by the presence of numerous chambered shells, called cephalopods, of such a structure as is not found in the higher rocks, and by the existence of very peculiar crustaceous animals, called trilobites.

The next or Triassic system has a thickness of only about 3,000 feet, but its animals and plants form a peculiar group, whose character can be learnt only from a detailed description. Among the larger animals, peculiar and gi-

¹ Especially since the recent discovery of the very curious trick which the workmen have played upon the geologists in regard to the arrows and bones in the deposits of the Somme. See London Times for April 25, 1863.

SUCCESSIVE SYSTEMS OF LIFE ON THE GLOBE.

ALLUVIAL		Historic, 100 feet.
		Quaternary, 400.
TERTIARY		Pliocene
		Miocene
		Molasse
		Upper Eocene
		London Clay
		Plastic Clay
CRETACEOUS		White Chalk
		Upper Greensand
		Gault
		Neocomian.
JURASSIC		Wealden, 1300.
		Superior Jurassic.
		Coral Group.
		Oxford Group.
		Grand Oolite, 780.
		Lower Oolite, 570.
TRIASSIC		Lias, 1100.
		Saliferous, 1600.
		Trias, 1500.
PALEOZOIC		Permian, 1000.
		CARBONIFEROUS, 10,000.
		DEVONIAN, 10,000.
		UPPER SILURIAN, 7000.
		LOWER SILURIAN, 20,000.

gantic reptiles begin to show themselves, and a few quadrupeds or mammiferous animals have been found. The fishes in this formation differ from all those below, in having tails with equal lobes, called homocereal, such as nine-tenths of existing fishes possess, but which are not found below the Trias. The plants are easily distinguished from the remarkable flora found towards the upper parts of the paleozoic rocks.

Next follows the Oölitic or Jurassic system, 3,300 feet thick, which presents us with an enormous development of huge reptiles, such as the Iguanodon, the Ichthyosaurus, the Pterodactyle; and small marsupial animals represent the mammals. These, it is well known, are the lowest in organization among quadrupeds, and therefore we should expect them to lead the way in the introduction of this class of animals into a progressive world. In the lowest part of this formation, most probably, are found those remarkable fossil footmarks in the valley of the Connecticut river, which Hugh Miller says "are fraught with strange meanings," and which certainly reveal an extraordinary assemblage of animals in that valley in ancient times. Among others are not a few tracks apparently of birds, some of them of fabulous size. This is the first time we meet with any traces of this class of animals as we ascend in the rocks. Although the Triassic group below seems to have been a period very deficient in life, the Jurassic period was very prolific of animals and plants, and of a decidedly higher organization than had before appeared.

The Cretaceous group, which succeeds the Oölitic, was 3,700 feet thick. Being for the most part a deep sea deposit, its plants are not very numerous or important; but its animals are very abundant, though mostly marine. The beautiful chambered shells, called Ammonites, of which more than three hundred species appeared in the Oölite, were almost equally prolific in the chalk. Another class of animals, generally microscopic and very low in the scale of organization, called Foraminifera, were so abundant as to

form a large part of the chalk. The usual building stone in the city of Paris is largely composed of them, as are several of the pyramids of Egypt.

The Tertiary group, that succeeds the chalk to a thickness of more than 9,000 feet, seems to have been deposited in rather shallow seas and estuaries, which however were of wide extent; as, for instance, a wide belt along the coast of the United States, from New York to Texas. There is a total change in the faunas and floras; the animals and plants having an aspect more like existing species than those in the older rocks. Many of the fossil trees bear a strong resemblance to those now growing in the forests, though most of them have a tropical character. But the most striking characteristic of the tertiary, is the great amount of mammiferous animals of higher grades than the marsupials, and some of them of gigantic size and colossal proportions.

The Alluvial period embraces all the deposits above the tertiary. Its most striking peculiarity is the appearance of man towards its close, with the vast multitude of associated races that now cover the earth. But most of the species—ninety-eight out of one hundred—that are found in the lower part of the alluvial period are still alive. The same is true of some hundred species in the tertiary, though some distinguished zoölogists maintain that none of the tertiary species correspond with those of the present creation. If they are distinct, all we can say is, that in consequence of the little disturbance that occurred at the close of the tertiary period, and in the alluvial period before the present creation, many species were enabled to live on through successive periods. One might almost doubt whether any new creation took place at the close of the tertiary period; and that we might, as one eminent paleontologist (D'Orbigny) contends, connect the Pliocene tertiary with the lower part of the Alluvial. But a comparison of the mammals in the two groups, according to Pictet, leads rather to the conclusion of distinct creations.

A popular representation of the great life-periods, which we have now gone over, assigns the Paleozoic period to the reign of Fishes, the Secondary period to that of Reptiles, the Tertiary to Mammals, and the Alluvial to Man. This, however, is only a poetic way of describing the wide prevalence of certain important species.

In the right-hand column of our chart the same great life-periods are represented as in the left. But they are subdivided into many others; because, according to our best paleontologists, life has been renewed on the globe many more than six times. Says D'Orbigny, "a first creation took place in the Silurian stage. After that was annihilated by some geological cause, and after a considerable time, a second creation took place in the Devonian stage, and successively, twenty-seven times, have distinct creations repeopled all the earth with plants and animals; following, each time, some geological disturbance, which had totally destroyed living nature. Such is the certain but incomprehensible fact, which we are bound to state, without trying to pierce the superhuman mystery that envelopes it."¹

Other eminent paleontologists, such as Pictet, Owen, and Agassiz, may differ from D'Orbigny as to the precise number of times the earth has changed its inhabitants; but all of them maintain the distinctness of life in different formations. Says Owen, "the sum of the animal species at each successive geological period has been distinct and peculiar to such period."² Says Agassiz, "one result stands now unquestioned: the existence, during each great geological era, of an assemblage of animals and plants differing essentially for each period. And by period I mean those minor subdivisions in the successive sets of beds of rocks which constitute the stratified crust of our globe, the number of which is daily increasing, as our investigations become more extensive and more precise."³ In our diagram we have

¹ *Traits de Paléontologie*, Tome II. p. 251.

² *Palaeontology*, p. 411.

³ *Contributions to the Natural History of the Northern States*, Vol. 1. p. 96.

followed, with one exception, the divisions of Pictet, which are twenty-five. He says, "many geologists admit at least twenty-five to thirty distinct stages, and consequently an equal number of faunas."

The Paleozoic rocks are divided by Pictet into five well-known groups, viz. Lower Silurian, Upper Silurian, Devonian, Carboniferous, and Permian. Distinct faunas and floras undoubtedly exist in all these great groups, and some believe that they are distinct in most of the thirty subdivisions which are established in these vast formations, and probably such will be proved to be the case.

The Triassic group is divided by Pictet into two distinct life-periods, the Trias proper and the Saliferous group. The Jurassic he subdivides into seven groups, reckoning upwards, viz. Lias, Lower Oölite, Grand Oölite, Oxford Group, Coral Group, Superior Jurassic, and the Wealden. The Cretaceous Group comprehends four groups, viz. the Neocomian, Gault, Upper Greensand, and White Chalk. In the Tertiary Group are six subdivisions, viz. Plastic Clay, London Clay, Upper Eocene, Molasse, Miocene, and Pliocene. Of the Quaternary or Alluvial he makes but one group, embracing the existing races. We should follow D'Orbigny rather, in making a group above the Quaternary, which we call the Historic Period, and which contains the remains only of the animals and plants now alive. We do not, however, extend this period as far down as the *Terrains contemporains, ou Epoch actuelle* of their author. For he embraces drift in it, and of course all those beds of modified drift above it that contain at least some extinct fossils. We carry back the period no further than the creation of man and contemporary races; whereas drift, and a large part of the stratified deposits above it, are immensely older. We know of no example where man and contemporary species have been found buried as deep as one hundred feet, except that comparatively small number of species which are found in drift and modified drift along with extinct races. These we suppose to have been created after the

close of the Tertiary and at the beginning of the Quaternary Period, and that no geological disturbance took place at the close of the Quaternary sufficient to destroy but a few of these species, and therefore they have lived on into the Historic Period, and ought not to be reckoned as a part of the latest creation. But we ought not to place the period of the creation of man, and of the vast numbers of existing animals which are found only a little way down in the alluvial deposits, as early as the drift, until we can find their remains in it. The presumption, in view of the facts, ought to be, that the great majority of the existing races were a new creation introduced at a period vastly more recent than drift, and that the few living species found below the burial places of that majority belong to an earlier creation.

The occurrence of man, the most remarkable of all animals, near the close of the alluvial period, would be, alone, sufficient to establish the historic as distinct from all other life-periods; sufficient at least to create a strong presumption that the epoch of his appearance was distinct from all that preceded it. But it strongly confirms this presumption, that while a hundred thousand species of animals, at the lowest calculation, are man's living contemporaries, geologists reckon only about fifteen hundred as fossil in the whole alluvial formation, including drift. All the living species are indeed buried as low down as man is; but their relics are so recent that they have not been called fossil. Even, then, though all the fifteen hundred fossil species were created earlier than man, it would leave an immense number which, by geological evidence, were introduced along with man; and thus should we have, at the commencement of the historic period, not only a new creation, but one more varied and perfect than any which has preceded it. Even though no convulsion or destruction of the species then existing took place, and we should be obliged to resort to records in the hands of man to show when the new creation occurred, its reality and importance would be none the less certain, especially since we can see in the greater

delicacy and perfection of organization of the historic period a good reason why its introduction should not be prefaced, like the earlier economies, by convulsion and dislocation.

How many times has the earth changed its inhabitants ?

We may set it down, then, as one of the best established facts of paleontology, that the earth has several times changed its inhabitants; as many as six times at least so entirely, that with the exception of the Tertiary and Alluvial, not a species is common to two adjoining groups, and as many as twenty-five times have the faunas and floras been so distinct as to prove their origin equally distinct. In such cases, says Pictet, "we find generally, in two successive faunas, the same genera represented by different species. Consequently we require, in order to characterize a special fauna, that the differences extend to all the important types: for instance, the Cephalopods, the Gasteropods, the Acephala, and the Brachiopods among the Mollusks, should have distinctive characters." By the application of such a rule, already as many as twenty-five distinct life-periods have been demonstrated, and doubtless further research will discover others.

There is another fact respecting these life-periods, more important in this discussion than their number. It is the wise and benevolent adaptation of the new races to the altered circumstances in which they are placed. The physical condition of the earth has ever been slowly but constantly changing, varying the temperature and the means of subsistence. Hence there must be a correspondent change in the nature of plants and animals, to preserve that wise adaptation to circumstances which existing nature everywhere exhibits. Now this has been done so perfectly that every change of animal structures has served to help them in the performance of their functions, and contributed to their happiness. No instance can be pointed out where opposite effects have been produced.

Another object seems to have been provided for in these

life-changes, and that is progress from the less to the more perfect. There has been improvement in the physical condition of the globe from the earliest times, and organic nature needed a corresponding advancement. Hence the lowest tribes of animals and plants abounded most in the lower formations, and successively higher and higher races were introduced, till the culmination was reached in the existing races. Particular races, indeed, have deteriorated at times, but upon the whole the progress has been upward, and the population of the globe is now immensely in advance of what it was in early times.

Still another object seems to have been kept in view. Amid these endless changes and upward progress, it was needful that unity should be preserved, so that all the minor systems of life should be harmoniously blended into one all-embracing organic system. In order to accomplish this, it was necessary that certain relations of the most delicate kind should be established between the several minor systems, and maintained in spite of stupendous physical revolutions; so that, while striking diversities should be manifest between the different systems, a golden thread of unity should be seen running through them all, and binding them into one harmonious whole.

Nor, in this connection, should the immense length of time it has required to develop and perfect these changes, be overlooked. An inspection of the various life-periods, as shown in juxtaposition upon our diagram, conveys no idea of great length of time; but it does make the impression that the history of the earth is little else than a succession of revolutions. But how wide of the truth are both these impressions! We are forced, by the most incontrovertible evidence, to the conviction that the period between the earliest brachiopods and zoöphytes of the Silurian seas and man's appearance, may be reckoned by hundreds of thousands if not millions of years; and this not as a flight of imagination, but a deduction of sober reason. Such a view separates the epochs of convulsion widely from one

another, and shows us that the earth's history is that of quiet and uniformity, and revolutions only the widely separated exceptions. Thus it is now, and thus it has always been since the first appearance of animals and plants; and thus it must be to prevent the destruction of so many delicate organisms. But how nicely adjusted must everything be to carry on and carry out so vast and complicated a system of organization as we have described through these almost interminable ages, and the occasional conflict of stupendous forces!

How have the Changes been effected?

Such are the leading facts respecting the successive systems of life that have appeared on the globe. We naturally inquire by what agency have these remarkable changes been brought about? Has it been by natural laws, or by miracle?

We have seen that naturalists find no great difficulty in accounting for the disappearance of the successive systems of life by natural causes. Sir Charles Lyell contends, as we have seen, that the slight changes now taking place as to food, climate, and by man's encroachments and the struggle between species, are sufficient to show how, one by one and at long intervals, they drop out, until at length all are gone, and new ones, in the like quiet and unobserved manner, are substituted. But the ablest zoölogists and paleontologists regard these views as inadequate to explain the facts. They find such evidence that the species which have lived together during a formation have generally disappeared together, that they must impute their extinction to catastrophes, to sudden elevations or depressions or inundations.

It seems to us that these latter views are the true ones, with perhaps some exceptions in the newer strata. But on either theory it is not necessary to call in miraculous intervention to explain the destruction of species.

But not so easy is it to explain the introduction of new

species, whether singly or by groups, by natural law. Yet this has been attempted; and in modern times a vast amount of ingenuity and erudition has been employed to sustain what is called the Development Hypothesis, or the hypothesis of Transmutation, or the Origin of Species by natural Selection, or known by various other names. Though we find fragments of this hypothesis, *disjecta membra*, in various writers, from Democritus downward, yet very few authors have attempted to bring out a complete system. La Place has given us what may be called the cosmogony of the subject, in his Nebular Hypothesis, which takes matter in its gaseous form, and as he supposed needing no Deity, transmuting it into spheres, which gradually became solid. Lamarck and other French zoölogists, attempted to show how animals and plants might spring, by the force of law, from particles inherently vitalized, which may be called the zoögonny of the hypothesis. And the same writers, and many others since, have labored to show how animals and plants once started might, by law also, pass upward from one species to another to their culmination in man. This may be called the zoönomny of the subject. No work has brought out the entire hypothesis so fully, and we may add so ably, as the anonymous work entitled "Vestiges of the Natural History of Creation," though its zoönomny has been more extensively and ably illustrated by Mr. Darwin, in his work on the Origin of Species. The grand conclusions at which the latter writer arrives are, "that animals have descended from, at most, only four or five progenitors, and plants from an equal or lesser number." "I should infer," says he, "from analogy, that probably all the organic beings which have ever lived on this earth have descended from some one primordial form, into which life was first breathed."¹ This primordial or fundamental form, the zoögonist tells us is a globule having another globule forming within it, to which electricity imparts life. And thus the process is started and carried on, from stage to stage, with-

¹ Origin of Species, p. 419.

out the aid or the need of a Deity. We would not, indeed, charge all the advocates of these views with an intention to sustain atheism, though if adopted in full we do not see any necessity for a supreme Creator. But some of these writers, while they believe in full in the transformation of species, even to the extent advocated by Darwin, do yet admit that the process was started by a Creator. What Darwin's views are on this point does not appear; for though the principles of his work, as most men view it, tend to subvert the fundamental principles both of natural and revealed religion, we have noticed in it only one allusion to the Deity, and to religion none at all. It is quite possible, however, that he may maintain that the law of natural selection, which with him is the universal, omnipotent power in nature, may have originated with a personal Deity; but we should rather presume that a scientific mind like his would see that there is no necessity for this, if his views be fully adopted; for he who can believe that the ten thousand exquisite diversities and marvellous adaptations of organic nature can have resulted from a mere blind law of selection, might with quite as much reason admit that the "one primordial form," which is little more than a vitalized mass of jelly, might have been started by electricity or some other law. This however is not the worst feature of the Development Hypothesis, because it does allow of a professed belief in theism. The chief anti-religious aspects of the hypothesis, especially to a believer in revelation, are the following:

1. It renders doubtful and unnecessary the existence of a Deity.

2. It leads inevitably to the grossest materialism. Those advocates of the hypothesis who start the organic process from albumen and electricity, cannot surely find anything in the subsequent developments but matter and its functions; for any immaterial principle introduced would require Divine interposition. So if we start with a "primordial form," it must be an Acaleph, or some other organism of the

simplest kind; yet all subsequent races, including even man, must have been derived from it, and unless we suppose the Acaleph an animalcule, or a sponge for instance, to possess mind, how can it be obtained for any of the higher races by mere selection and transmutation? The consistent advocate of the hypothesis must therefore adopt materialism.

3. In the third place, for a like reason he must reject the doctrine of man's immortality, or admit the very lowest forms of life, the Radiates, the Acalephs, the Amorphoza, the invisible animalcules, encrinites, trilobites, mollusks, fishes, and so on, to be also immortal. For these are man's progenitors, from whom he was derived by direct succession; nor will the hypothesis admit a break anywhere in the chain where a mental and moral nature might have been introduced. Rather than admit the immortality of all these lower forms of life, many of whom it is difficult to distinguish from plants, the logical mind will say man is not immortal, but perishes utterly at death.

4. In the fourth place, the same reasoning destroys human responsibility to God, or imposes it upon all the inferior animals. No man will admit the latter alternative; for no being except man shows the slightest marks of possessing any moral powers. But as he was derived from them by the principle of selection, if they are not accountable to a superior being, neither is he.

5. Fifthly, by this hypothesis man cannot be a fallen being, as both reason and revelation testify. For, on the contrary, he has been continually rising, physically, intellectually, and morally, and is steadily advancing to his culmination.

6. Finally, the doctrine of an incarnate Redeemer and Saviour is absurd. For no such intervention is needed.

Such are the natural fruits of this hypothesis. If in any case they do not follow, it must be the effect of education, of common sense, or other influences. But if men adopting this hypothesis are consistent, they will not stop short of

this creed, or rather this absence of all creed; for with such views we do not see what can be left worth calling religion.

But after all, the real question is, not whether these hypotheses accord with our religious views, but whether they are true. We cannot find space to go into this discussion; nor, after what has been written upon it in volumes and periodicals, is it necessary. The most important point in it relates to organic remains. For if the doctrine of transmutation of species be true, we ought to find ten thousand intermediate varieties in the successive formations. Instead of pointing out a single example of such transition links, Darwin lays himself out to impress his readers with the imperfection of the geological record, on the pooriness of our paleontological collections, and on the intermittence of the formations, explaining every case of the sudden appearance and disappearance of species by supposing long periods to have intervened between the deposits, during which the transmutation may have occurred somewhere by natural selection, and the new species may have been disseminated by migration. Thus without a single positive example to sustain transmutation, and in the face of a vast number of cases of sudden and entire change of life, we are called on to believe in this doctrine on the strength of mere hypothesis. No wonder that Mr. Darwin regards the absence of all "intermediate links" as the "most obvious and gravest objection which can be urged against my [his] theory." He need not wonder if others regard it as insuperable.

It is a significant fact that very few of the advocates of the transmutation hypothesis refer to man as an example of it. Yet if it be true, man ought to be a conspicuous illustration of it. For in his case we have the most perfect of all animals and vastly the superior of them all, appearing suddenly at a very recent period; for though geologists may contend about the precise period of his appearance, all agree that it was very recent, and none contend that it was earlier than the alluvial period. Whence came he? If he

is only one of the lower animals metamorphosed, we ought surely to find a multitude of intermediate varieties. But not one has ever been brought to light. The monkey tribe must have been his immediate progenitor. But only a very few species of these have been found fossil, and none below the Tertiary, and all of them differ as much from man as do the living monkeys. Lamarck had the boldness to attempt to describe the process by which the monkey was transformed into a man. But the picture was so absurd and ridiculous that few have attempted to make a sober philosophical defence of it. Yet if it fails in a species so conspicuous as man, it fails as to all others. But it is less revolting to common sense and experience to represent obscure radiate or articulate or molluscous animals as slowly transmuted from one species into another, than to bring man into the same category. Therefore silence in respect to him is the wisest course. For what philosophic mind, free from bias, can believe such a being, the highest of all animals in anatomical structure and intellect, and possessed of a moral nature, of which no trace exists in any other animal, is merely the product of transmutation of the radiate monad through the mollusk, the lobster, the bird, the quadruped, and the monkey, either by Lamarck's principle of "appetency," and "the force of circumstances," or Darwin's principle of "selection"? The fact is, man's appearance at so late a period in the earth's history, and so independent of all other species, seems a providential testimony to the absurdity of this hypothesis.

Opinions of Eminent Naturalists.

We have seen, however, that it has been adopted by some naturalists. How is it with the distinguished paleontologists and zoölogists to whom we have referred as the highest authority on such questions? We quote first from Professor Pictet, who says, "the theory of the transformation of species appears to us entirely inadmissible, and diametrically opposed to all the teachings of zoölogy and

physiology." Says Agassiz, "nothing furnishes the slightest argument in favor of the mutability of species; on the contrary, every modern investigation has only gone to confirm the results first obtained by Cuvier, and his views that species are fixed." "It cannot be denied that the species of different successive periods are supposed by some naturalists to derive their distinguishing features from changes which have taken place in those of preceding ages; but this is a mere supposition, supported neither by physiological nor geological evidence, and the assumption that animals and plants may change in a similar manner during one and the same period. On the contrary, it is known that the evidence furnished by the Egyptian monuments, and by the most careful comparison between animals found in the tombs of Egypt with the living specimens of the same species obtained in the same country, that there is not the shadow of a difference between them, for a period of about five thousand years. Geology only shows that at different periods there have existed different species; but no transition from those of a preceding into those of the following epoch has ever been noticed anywhere."¹

Says Owen, referring to the hypotheses of Wallace, Darwin, and others, "observation of the effects of any of the above hypothetical transmuting influences, in changing any known species into another, has not yet been recorded. And past experience of the chance aims of human fancy, unchecked and unguided by observed facts, shows how widely they have ever glanced away from the golden centre of truth."²

Compelled thus by the principles of true philosophy to discard an hypothesis so unreasonable, these distinguished savans have felt as if special acts of creation by Divine power were the only alternative to account for the successive introduction of new groups of organisms upon the earth's surface. "The two first explications" (that of the

¹ Contributions to the Natural History of the Northern States, Vol I. p. 51.

² Palaeontology, p. 406.

displacement of contemporaneous faunas — *deplacement des faunas contemporaines* — and that of transmutation), says Pictet, “being inadmissible, there remains the third, which is known under the name of *the theory of successive creations*, because it admits the direct intervention of creative power at the commencement of each geological epoch.” But though forced by his philosophy to admit this theory, it is obvious that his religious views, or something else, make him feel desirous of getting rid of it, and therefore he makes a suggestion of the possibility of some other explanation, which we shall notice shortly.¹

Professor Owen is more decided. “We are able,” says he, “to demonstrate that the different epochs of the earth were attended with corresponding changes of organic structure; and that in all these instances of change the organs, still illustrating the unchanging fundamental types, were, as far as we could comprehend their use, exactly those best suited to the functions of the being. Hence we not only show intelligence evoking means adapted to the end, but at successive times and periods producing a change of mechanism adapted to a change in external conditions. Thus the highest generalizations in the science of organic bodies, like the Newtonian laws of universal matter, lead to the unequivocal conviction of a great First Cause, which is certainly not mechanical.”²

With still stronger emphasis does Agassiz speak of the origin of animals. “All these beings,” says he, “do not exist in consequence of the continued agency of physical causes, but have made their successive appearance upon the earth by the immediate intervention of the Creator.”³

To the unsophisticated mind, untrammelled by theories, the inevitable conclusion from all these facts is, that the successive appearance of numerous groups of animals and plants on the globe, forms so many distinct examples of

¹ Traits de Paléontologie, Tome I. p. 87.

² Palaeontology, p. 414.

³ Contributions to the Natural History of the Northern States, Vol. 1. p. 135.

miracles of creation. For in the view of all except the advocates of the Development Hypothesis, they demanded a force above and beyond nature in her ordinary course, and this is the essential thing in a miracle. What believer in the Bible ever doubted that the creation of man and contemporary races was a miracle in this sense? Indeed what stronger evidence of miraculous intervention have we anywhere than the creation of organic beings, especially of man? and his introduction is one of the facts of geological history. But the mere creation of these successive races is not the whole of the matter. For they were nicely adapted to the altered condition of things at the different epochs. They showed, also, a gradual elevation on the scale of being, as we rise higher and higher. If it was not a miracle to introduce succeeding groups under such circumstances, that is, a special divine intervention, then we despair of finding a miracle anywhere. Even the creation of matter out of nothing might as reasonably be excluded from the class of such events, as the creation of organic beings. Indeed, if we admit that the latter fact is not a miracle, we think the term would ere long become obsolete, both in philosophy and theology, unless it be retained in the limited sense given to it by M'Cosh.

New Hypothesis against Miracles.

Strenuous efforts, however, are made at this day to exclude these events from the class of miracles or special divine interpositions. And what is most remarkable is that these efforts originate chiefly from men who are the professed friends and commissioned defenders of revealed religion. The following statements will give an idea of their main hypothesis.

Professor Pictet, as we have already intimated, has suggested the leading points of this hypothesis, though he mentions it as merely possible. "The phrase *successive creations*," he says, "has the inconvenience of not giving latitude enough, and excluding, for instance, the possibility

that the beings of each successive fauna might proceed from those which preceded it, as the effect of some unknown law, different from that of normal generation, of which the doctrine of *alternation of generations* might give an approximate idea — a law of nature which should manifest itself at remote intervals, but with regularity, and which might be unknown to us because we live in one of these intervals.”¹

It is essentially the same theory that is advanced by Rev. Professor Powell in the following passage from his *Order of Nature*. “The same assurance applying to existing life must also be equally extended to all those marvellous changes in species which geological epochs disclose to us, and which, occurring as a part of a regular series, and giving rise to equally regular results, connected on every side with other events going on by natural causes, must themselves be equally referred to natural causes.”²

Professor Powell believing, as we have seen, that “in nature and from nature, by science and by reason, we neither have, nor can have, any evidence of a Deity working miracles,” and not being quite ready to fall in with the Development Hypothesis, though he treats it with great respect, we might expect would adopt the preceding theory as a provisional escape from the doctrine of miraculous creation. But it is more difficult to understand why the ingenious author of the work entitled “the Stars and the Angels,” whose conclusions so generally accord with evangelical religion, should have given it his countenance, as he does in the following passage: “It is by no means discordant with the analogies of nature to suppose it quite possible that the successive creations of the pre-Adamite world were not the products of miraculous power, but the natural results of the operation of some great law, of the nature of which we are at present ignorant, and of which we cannot perhaps form even a conception.”³

¹ *Traits de Paléontologie*, Vol. I. p. 87.

² *Order of Nature*, p. 171.

³ *The Stars and the Angels*, p. 148.

Though, as we have seen, Dr. M'Cosh represents this subject as a "controversy," which he hesitates to decide, and says that the advocates of the hypothesis "have certainly explained much in this way," yet he should not by any means be reckoned as its advocate, although it would not be strange if its friends should claim so distinguished a name. But he reluctates strongly against the leading points of the hypothesis, and says distinctly, "that natural causes certainly seem utterly incapable of producing such a being as man." We trust that ere long the distinguished theologian will become as decided on this point, which we regard as of vital importance, as are such men as Agassiz, Owen, and Hugh Miller, who judge simply as naturalists, without any theological biases.

It is indeed quite remarkable that while we find a few orthodox theologians hesitating whether to call creation miraculous, the distinguished philosopher "Leibnitz expressly includes in the class of miracles, properly so called, creation, annihilation, and the incarnation of the Son of God."¹

Since the hypothesis opposed to that of Leibnitz as to creation, suggested by the writers named above, is essentially the same, we shall have reference to them all in the remarks which we offer. They all seem to us to labor under certain false notions about miraculous interposition, by which we wish it to be borne in mind, we mean special Divine intervention, inexplicable by natural law.

1. In the first place, they admit in the geological creations all that is essential in a miracle. They concede that these events are explicable by no known laws of nature. And surely this is the essential thing in a miracle. It is an event that requires the intervention of some other power than that of nature. The question what the new power is, ought not to embarrass the subject; for since everything originates with God, we may be sure that this creative force comes from him. It is a power introduced by him in

¹ Powell's *Order of Nature*, p. 206.

contradistinction from the laws of nature. If this is not miracle, what can be ?

2. These writers assume that any events brought about by the operation of law, and which therefore may recur at intervals, cannot be miraculous, but must be natural.

This conclusion results from the very common opinion that miracles are not under the control of law at all, but special divine interferences with nature, having no connection with anything that precedes or follows. But even if this be admitted, it would not prove these isolated occurrences independent of all law, but only that we could not comprehend it. For, what is necessary to prove an event subject to law ? Uniformity of recurrence in the same circumstances is all. But will any one doubt that, in precisely the same circumstances in every respect, the Deity would perform the same miracle ? To doubt this would be to suppose the Deity to change his mind upon reflection, and thus to assail his perfections. Suppose exactly the same reasons for raising a dead man to life should recur every thousand years, as existed in the case of Lazarus, so that we could even predict the time of its occurrence, would the event be any the less miraculous provided it always required divine intervention, and could not be explained by natural law ? Or, to make the case more nearly parallel with the geological creations, suppose the event to occur once in a hundred thousand years, so that the record of one resurrection should all be lost before the recurrence of another. It would still be governed by law, and yet be strictly a miracle. Indeed, what action is there of a Being of infinite perfections that is not under the control of law ? that is, would he not always act alike in the same circumstances ? To deny this is to assail his perfections, and this we do virtually, as it seems to us, when we refuse to acknowledge miracles to be subject to law. It is not strange, therefore, that such master minds as those of Wollaston, Butler, and Babbage have maintained that there is a law of miracles as well as of common natural events.

The ground we take is, that miracles are events resulting from the introduction of a new and perhaps broader law at such exigencies as the Deity pleases in contravention of nature's ordinary laws either to oppose or intensify or diminish the force of nature. Even if the miracle should never be repeated, it would still be according to law; that is, it would be repeated if the same exigency should recur.

Do you say that it destroys the idea of a miracle to suppose it controlled by law? It is rather an arrest of nature's laws by a special act of the Deity, irrespective and independent of law.

It is indeed a special intervention of the Deity at such time and manner as it pleases him; neither is there any inherent force in the law of miracles any more than there is in natural law. Both are only a name for the uniform mode in which the Deity acts; and we say that the very nature of the Deity requires him to act uniformly, always, in like circumstances. The essence of the miracle lies in the interference with natural law, in God's own time and manner, nor has the fact of its subsequent recurrence anything to do with its nature.

Professor Babbage, in his Ninth Bridgwater Treatise, has ingeniously illustrated this subject by reference to his renowned Calculating Machine. But we have not time to go into the details.

But it may still be objected that if we take the definition of "natural" as given by bishop Butler, viz. as something "stated, fixed, or settled," it must embrace miracles if they are introduced by law. It might be so if we could understand the laws of miracles as we can those of nature. This was Butler's view. He says, "persons' notions of what is natural will be enlarged in proportion to their greater knowledge of the works of God and the dispensations of his providence. Nor is there any absurdity in supposing that there may be beings in the universe whose capacities of knowledge and views may be so extensive as that the whole Christian dispensation may to them appear natural; that is,

analogous or conformable to God's dealings with other parts of his creation; as natural as the visible, known course of things appears to us."¹ Butler, however, did not suppose that in this world men are able so to understand the laws of miracles as that they should be placed in the class of natural events. Yet he declares it "supposable and credible that God's miraculous interpositions may have been all along by general laws of wisdom."² He does not seem to have imagined that this view converted miraculous interpositions into natural events even by his definition of what is natural. For though to superior beings they may appear "stated, fixed, or settled," they have not that aspect to men, but seem rather to be interferences with natural laws, although they may in fact be as much subject to law as nature is. These views of Butler appear to us to be mainly true, though we should prefer a modification of his definition of what is natural, so that it should embrace only such events as seem to human view to be "stated, fixed, or settled," so as not to include others (miracles, for example) which are really but not apparently so.

Is it not clear, then, that we may admit a law of miracles and their recurrence in the same circumstances, without making such events a part of the course of nature. But we need not, after all, resort to such a doctrine in order to prove the successive geological creations miraculous. For no two of them have ever been exactly alike. They have all of them been adapted to new circumstances, nor have the intervals between them been the same; and as the condition of things has been constantly changing, no two of them have ever been exactly alike. Certainly the nature of the animals and plants has varied widely with each new creation, so that at the different demiurgic epochs there has been no agreement except that a new creation has always taken place. These events, therefore, have not been a repetition of one another, but independent acts of creative power, corresponding to the general idea of a miracle as an insu-

¹ Analogy, Part I. Chap. i. p. 129.

² *Ib.*, Part II. Chap. iv. p. 252.

lated act of divine intervention. In another connection we have gone into fuller details on this subject. We say enough here to show, first, that even if the geological creations have been exactly repeated, and therefore subject to law, they are none the less miraculous; and secondly, to show that they never have been exactly repeated, and therefore may be regarded as insulated and independent miracles.

3. The second argument by which the advocates of this hypothesis would exclude the geological creations from the class of miracles, is their connection in a harmonious series with natural events. The argument, as already quoted, is, that the introduction of new species, "occurring as a part of a regular series, and giving rise to equally regular results, connected on every side with other events going on by natural causes, must themselves be equally referred to natural causes."

This reasoning seems to imply that a miracle can have no connection with the course of nature without becoming a part of that course. For example, the creation of a world cannot be a miracle, because it is necessarily connected with all the natural processes that ever take place in such a world. So the production of successive races of animals and plants starts the various natural processes by which they are continued from generation to generation, and therefore, whether we can explain it or not, the process must be natural. But how is it possible to disconnect any miracle from a regular series of natural events? Christ's resurrection was the starting point of the church, which by natural laws has changed the entire aspect of the world. So the cloud by day and pillar of fire by night in the wilderness of Arabia, was indispensable to the safety and prosperity of the Jews and the spread of religion in the world by a regular series of natural means. The ability to speak languages never learnt gave the grand impulse to the series of natural means by which the gospel has been spread. Yet by this reasoning none of these events could have been miraculous. Can there be any doubt that the

reasoning must be false that leads to such absurdities? The matter of fact is, that God has always adapted miraculous interposition to the natural processes, and the more perfect the adaptation is, the more wonderful should we consider the miracle to be, instead of doubting whether it is a special intervention. The only question is: do the events under consideration require some power above and beyond nature to produce them; that is, are they explicable by natural law? If not, the fair inference is that it was an exigency that required the introduction of the law of miracles. The geological creations form the commencement of vast natural processes, but the processes could not start themselves, nor could anything else short of special divine power and wisdom. Why should the wonderful adaptation of these interventions to the harmony and perfection of the subsequent natural developments throw doubts over their miraculous character? If that character can thus be taken away, it can, for the same reason, be taken from every known recorded miracle; nor would it be possible to prove any miracle, because every sublunary event must have a connection with every other.

4. Finally, the advocates of this hypothesis do, as it seems to us, unwittingly describe the law of miracles when they impute the geological creations to some "unknown law," "of which we are at present ignorant."

They admit that these creations cannot be explained by any known law of nature, but imagine one to exist adequate to produce the phenomena, though we do not know its nature. Now in our view a prime distinction between the laws of nature and the law of miracles is, that we can understand the former but not the latter. If we could understand it, as Butler suggests superior intelligences may, it would indeed cease to be miraculous, if we take his definition of what is natural. Hence we should hardly want a better description of the law of miracles than the author of "the Stars and the Angels" gives, when he imputes the geological creations to "some great law of nature, of which

we are at present ignorant, and of which we cannot perhaps form even a conception." If he had not expressly disclaimed the miraculous character of the geological creations, we should conclude, after reading this sentence, that the difference between us was only in the use of terms. But of one thing we are certain, that after he has acknowledged that stupendous creations may have taken place as the result of some undiscovered law of nature, he can no longer defend any of the miracles of revelation against the sceptic who should impute them to some hidden and yet unknown law of nature; for none of them, setting aside the Mosaic creation, are half as wonderful as the creations of the geological record. We do not suppose that this author meant thus to make all miracles doubtful; yet not a few others at this day aim at nothing less than the entire overthrow of the doctrine of miracles in religion. Geology, we think, is the battle ground where this contest is to be decided. Hence we have dwelt long on this subject; for we fancy that those who go against miracles will either adopt the Development Theory, or the hypothesis which denies the miraculous character of the geological creations. Should this last view prevail generally, a disbelief of miracles of every sort will, we think, follow, and, of course, of Christianity as a miraculous dispensation. This is the consummation aimed at by the scepticism of the present day; not, as in days past, to prove the Bible a miserable fable, but allowing it to be a very venerable, respectable, and useful book, only it is not miraculous nor infallible. But before such a consummation is reached, we fancy that the geological record must be proved false.

Intellectual Laws.

4. We proceed to a consideration of a fourth class of laws, viz. the intellectual, or those which govern mind.

That the laws of mind are as certain in their operation as those governing matter, cannot reasonably be doubted. Yet with many the idea that their mental operations are sure to move in a fixed path, which could be marked out by

an Infinite Mind as readily as that of the sun in the heavens, is a repulsive thought; for they connect it with the idea of fate, and feel that it must destroy the freedom of their wills. But free as the will is, is it not determined by something, either by a single motive, or by many, or by the predominance of some over others? And have not these motives all been weighed in the scales of Omniscience, and their exact dynamical power estimated, so that their single or combined effect is known to such prescience? To us, indeed, human decisions and other mental operations seem often arbitrary and independent of all law; but if they really are so, we are driven to the absurdity of admitting effects without a cause. But we will not attempt to discuss such a subject in this place, although aware that we should find powerful opponents to the positions laid down above.

The movements of the mind bear an analogy, so far as mental processes can be paralleled by those that are material, to those of the atmosphere. Rarely do the various faculties act unitedly and with full power; but there is generally more or less of conflict and unequal action among them. The result is, that mental processes, like atmospheric phenomena, manifest unceasing change, apparently independent of all law, just because the forces are too numerous, and their action too complex, for our feeble foresight to discern the resultant.

But the point of this subject which we would make most prominent, is the influence which one mind is able to exert upon another, especially that by which the Uncreated Mind is able to affect and control those which he has created. We know well that human decisions are modified and entirely changed by the influence that comes in a thousand ways, directly and indirectly, from their fellows; and we know, too, how deeply and how widely the decisions of the human will affect the temporal and eternal welfare of man, and sometimes produce important effects even upon the course of nature. Can we doubt that the Infinite Mind is able to produce, in created powers, changes still more

radical and extensive? Who can have such intimate access to such minds as their Creator? Who can know, so well, how to touch the chords of influence? Who can throw before them such mighty motives as he who knows all things? Who but God can so enlighten the reason, mould the will, and vivify the affections, that a man's feet shall be infallibly turned into the right path?

We know that many show great sensitiveness when divine influence is represented as so mighty over the human heart and will, on the ground that they are thus converted into machines, and their free agency destroyed. But does it infringe upon the freedom of their wills when they are influenced by their fellow men voluntarily to change their opinions and adopt new courses of life? So long as they act voluntarily, do they not act freely? And that is just the state into which divine influence brings them. So the Christian scriptures represent it: "My people," says God, "shall be willing in the day of my power." "Work out your own salvation with fear and trembling; for it is God who worketh in you to will and to do of his good pleasure." Our reason teaches us that God could thus make men willing to do whatever he desired, and the Bible shows us that he actually exerts this power. And who will say that what a man does of his own choice, is inconsistent with liberty, or any other attribute of free-agency?

But if God does thus interpose, we know not how often, what a mighty agency for changing human purposes and modifying events is thus introduced into the affairs of this world! We may be convinced that the laws and operations of the human mind are invariable; but here is one extraneous influence coming in to baffle all our calculations, and by unexpected changes to control all the affairs of men. Here, then, constancy is subordinate to change.

Combined and Mutual Influences.

5. We proceed, in the fifth place, to consider what changes may be effected by the combination and mutual action of those laws on which events depend.

In treating of the laws of organism we have adduced the most important examples of special or miraculous intervention in nature. The appearance of successive systems of life on the globe teach us all that we know from natural religion respecting the law of miracles. They teach us that this law is a force coming in to take the place of natural law at such times as God chooses; and they show us that as often as the same circumstances occur, we may expect the same miracle, although as a matter of fact, precisely the same circumstances never have recurred in the earth's history; and therefore there has been no repetition of precisely the same miracle, as we have more fully shown in another place.

We need not, then, go into a further consideration of the law of miracles. But the subject announced under this fifth head will need full illustration; for it shows us the most important means by which the purposes of divine Providence are accomplished, without miracles. So linked together are all the events of this world, great and small, that divine wisdom is generally able to accomplish its purposes without disturbing the settled order of nature, yet with all the certainty of miraculous intervention, but without its inconveniences. We have examined the separate action of the great laws of nature. But still more important is it to consider their combined action, because herein lies the grand instrumentality by which God's providential government is carried on.

The assertion of bishop Butler, that "any one thing whatever may, for aught we know to the contrary, be a necessary condition to any other,"¹ has an air of extravagance to those who have not thought much of the wonderful connection and influence of events. But we believe it to be literally true, and that it might have been announced in a more positive manner. The fact is, very few if any events in this world, happening to men, result from a single cause; and if we were to trace out their antecedents,

¹ *Analogy*, p. 201.

we should find them exceedingly numerous and complicated. Indeed by running back only a short distance, we should find so many lateral streams of influence coming in on either hand to modify the main current, leading to a particular event, that we should despair of mapping out the whole, and could easily be made to believe that every single thing in our personal history may have been connected with every other thing that has gone before us.

Various illustrations of this wonderful connection of events have been attempted, all of which give only a partial and inadequate view. One supposition is, that events in this world resemble a network, no single mesh of which can be formed or altered without affecting the whole. Another illustration supposes a hollow sphere, through which a vast number of balls are flying, in all directions and with various velocities. Constant collisions must of consequence occur, by which the course of the balls will be changed, perhaps again and again, nor can any mind but the Infinite determine when or where they will reach the circumference of the sphere. But Omniscience sees the whole complex movement, and knows the effect of every collision, and can, therefore, determine the exact course and termination of every movement. Nay, in the great sphere of the universe God may, in the beginning, have so arranged events and their causes, that the final resultant of all the movements shall be the exact fulfilment of some wise and special providence.

The Sea of Life.

Another illustration represents events to be the result of an indefinite number of forces, or streams of influence, acting upon one another at all angles and with various degrees of intensity. Were this the proper place, it would be easy to draw out an allegorical illustration that should strikingly impress this subject. It should represent the "sea of life," on which every human voyager must sail, with its safe and unsafe harbors, its rocks and shoals, its straits and bays, its favorable and unfavorable currents, its prevalent winds and

storms, and its beacons and lighthouses. From "hope harbor" every one goes forth in life's morning, buoyant with anticipation. But some, almost without lifting sail, float away into "indolence lagoon," and never emerge from thence. A current, however, from the "stream of knowledge" sets sometimes strongly across the harbor's mouth, so as to strike if possible every voyager and give him an influence in the right direction. Another from the same stream sets in the same direction, and bears some vessels onward with such force that no after influence can turn them from "learning's retreat," on the opposite side of life's sea, where some spend life's evening, not doubting but it is heaven's vestibule. Out of "ambition's inlet" comes a strong current also, that bears away not a few voyagers towards the palaces and towers of "earth's pinnacle." Not a few, however, struck by unfavorable winds and storms, are driven aside into "disappointment straits," where they miserably go to pieces on the rocks, except now and then one who is able to double "cape humility," and with new experience to venture out again upon the open sea, where they sometimes fall into a current which sets out of "grace inlet," said to be fed from the "upper springs," and which sweeps around the whole sea, so as to strike every voyager and turn his course towards heaven's gate. A little beyond "ambition's inlet" rises "passion's submarine volcano," said to be fed from the "nether springs," which pours out a constant stream of hot water, which sweeps with great violence across the whole sea, and turns many a noble ship out of its course, hurrying it into the "gulf of infamy." Still farther along enters the "ice floe of scepticism," which, fed from an "arctic sea," sets across the whole sea of life, and piles up its bergs and ice islands all around "hope's grave." Now and then a noble craft gets so entangled in crossing this floe, that it is drifted onward till it disappears in hope's grave, where no life-boat is ever seen.

In the midst of life's sea rises an island on which stands "Bible lighthouse," whose revolving lights illuminate every

part of the sea (for the fog-covered islands of heathendom are here left out of the account), show every dangerous shore, all the breakers and the shoals, all the safe and unsafe harbors, and especially concentrate a strong light upon the entrance to heaven's gate, which is situated opposite "hope harbor," and in which every voyager, as he leaves the harbor, expects finally to cast anchor.

Nearly all the crews that man the different vessels feel themselves fully competent to act as pilots, not only out of "hope harbor," but over the whole sea. Their incompetence, in most cases, is the cause of many a wreck. Take one or two examples :

A very forward pilot, called Imagination, sometimes seizes the helm, as the voyager goes out of "hope harbor," and he always steers first for "Fancy's look out," which is a commanding eminence a little to the left of the harbor. Through the telescope, which Fancy has mounted on that hill, it is easy to persuade the voyager that he sees in the far-off horizon most enchanting regions, mountains of surpassing grandeur, and vales of paradisaical loveliness. Imagination undertakes to guide the ship thither. But ere long a region of alternate calms and storms is encountered, the vessel gets aground among the sand-bars of "poverty shoals," and the voyager finds that his delectable mountains and vales are only fog-banks. His ship becomes unseaworthy, and he is cast on the island of desolation, where he spends the residue of his life poor, disappointed, and broken hearted.

Upon another vessel leaving "hope harbor" we find Lucre at the helm, and he of course steers directly for the "gold coast," which lies a little beyond Fancy's look-out. This is one of the most populous regions around the whole sea ; for it is not only a place for digging gold, but for carrying on the various pursuits of commerce and manufactures by which large fortunes are secured. Whenever this is accomplished, the voyager re-embarks, and steers for "Dives's retreat," on the opposite side of the sea, borne onward by strong winds always blowing towards that spot, and called

the "trade winds." Sometimes, however, when Pleasure is the pilot, the vessel anchors in "temptation bay," where the riches of the voyager melt away, and if the vessel ever gets to sea again, it is only to be swept by Passion's stream into the gulf of infamy. But if another approaches Dives's retreat, it is frequently attacked and robbed of all its treasure by the hard-hearted inhabitants of "pirate's island," and then the ship goes to pieces on "poverty rocks." A marvellous escape, however, sometimes happens to the broken-hearted voyager; for as he is floating about on some fragments of the wreck, he falls into the stream from "grace inlet," and is borne gently onward into the very gate of heaven.

But the voyager whose highest wish is to find his way to the gate of heaven, need not be subject to these wrecks and failures. Let him put Conscience at the helm when he starts, and have Reason and Self-denial and Faith and Perseverance among his crew, and take care to steer close along by "Bible lighthouse," and he may go safely across all hostile currents, weather all the storms, and early anchor at the gate of heaven. Alas, how few voyagers are thus wise and happy!

How easy would it be to multiply a hundred-fold these allegorical representations, which should find their complete parallels in human life! We have given enough, however, to show the thoughtful mind how incalculably great is the number of influences by which the time, place, and manner of life's important epochs and its termination, are modified and determined. All the events of life are indeed but the resultant of these unnumbered forces, too complicated for any but a celestial arithmetic to calculate. Amid complications and mutations so endless, where can we find any constancy of which our mathematics can give the formulae? True, we can see that all is under the control of law, and taking certain leading principles as our guide, we can predict with some confidence certain general results; for example, that virtuous conduct will lead to hap-

pinness, and vicious conduct to misery. But by means of the conflicting influences that have been described, God keeps the condition and destiny of each individual in his own hands. How easy for that Infinite Mind, who in the beginning drew out this whole net-work of our lives, so to have arranged every influence and every result as best to accomplish his purposes, secure our welfare, and the highest good of the universe, without interfering with our free-agency, without working miracles, and without any failure or mistake.

This, this is a divine arrangement, that throws miracles into the shade, and that puts the whole warp and woof of human life, nay all the vast affairs of the universe, from the greatest to the least, under the supreme control; and yet all is brought about so easily and quietly that the divine purpose and the divine control are unperceived. Surely this is the culmination of the law of change, where we see it rising above, not only the law of constancy, but also the law of miracles. It lays bare the controlling principle of this and all other worlds, and reveals change, resulting from the mutual action of events, as the Deity's right hand in the moral world.

CONCLUSIONS.

The leading conclusion to which we are brought by this discussion is the proposition with which we started: That the law of nature's constancy is subordinate to the higher law of change. Is not the proof of it satisfactory? We have, indeed, found law everywhere, controlling every event, and each law acting alone is constant; but the combined or antagonistic action of two or more laws produces change, and though constancy be manifest in the great revolutions of nature, yet change is the leading characteristic of the world, both material and spiritual. It overmasters and throws into subordination what is called the settled order of nature. Some natural changes we can indeed predict with certainty; but in respect to most of them, especially the

operations of the human mind, prophecy is only vague guessing. Miraculous change, also, has so often interfered with nature's constancy in times past, by again and again peopling the world anew, that a presumption hence arises of future special interpositions. Everywhere, indeed, change triumphs over constancy, giving full proof that it is the higher law of the universe.

Admitting this as an established principle, and comparing it with the earth's past history, we arrive at other conclusions of deep interest, to some of which we invite attention.

Permanence and Change.

1. And first, we see how permanence and safety have been secured to organic beings, in a world whose history is one of ceaseless change and stupendous revolution.

Organism must have permanent quiet and constancy, or it could not survive and flourish. And such a state has been secured by interpolating long periods of repose between comparatively brief periods of disturbance. An inspection of our diagram, illustrating the successive systems of life that have appeared on the globe, conveys the impression that those systems have succeeded one another so rapidly as to make the surface the scene of almost constant catastrophes. But it is because we have here necessarily brought into juxtaposition events separated in fact most widely. If we look into the history of each separate formation, we shall find evidence that during an immense period quiet and security reigned, and races lived and flourished which very slight sudden changes would have destroyed. Take the system now passing. For how many ages have only such changes been allowed as would not seriously affect the delicate organization of animals and plants! Though change is incessant, as we have shown, it has generally been confined within narrow limits; and if there has been any deviation from the general constancy, it has been so slow as to be unperceived, without bringing into comparison periods of thousands of years, and such as

would not destroy organization. Thus the impression we get from passing nature, is that of constancy and permanency, and so it would seem to us had we lived during any of the periods that make up the long roll of the earth's history. How beautiful an example of divine wisdom and benevolence, so to arrange and balance causes as to reconcile things so incompatible as change and quiet, catastrophe and constancy, because the welfare of sentient beings demanded it!

Miraculous Intervention.

2. The scientific history of our globe shows us that nature's constancy has been several times interrupted by special miraculous intervention.

We of course refer to the numerous new species of animals and plants that have been introduced upon the earth, either singly or by groups, since life was first manifested. In the proper place we have given a detail of the facts, perhaps sufficiently prolix, and also an account of the various modes by which some have endeavored to avoid the conclusion just stated. A summary of the points discussed will be all that we shall introduce in this place.

One method by which it has been attempted to throw doubt over the miraculous origin of species, has been to maintain that the new ones have never been introduced by large groups, but singly from time to time, to replace old species, and probably by some unknown law of nature.

The reply is, that such a mode of introducing the new species, that is singly at intervals, is admitted only occasionally by the ablest paleontologists. But if it were true, the creation of a single species would demand special divine intervention as really as that of a group. It is something above and beyond nature, and though the result of an unknown law, it must be a law of miracles, and not of nature; for her whole record shows no analogous power.

Not satisfied with such views, not a few at the present day of philosophic mind, if they do not adopt the hypothesis of organic development, yet look with great respect upon it,

and hope that it may prove true. Perhaps they pass over, as a delicate and difficult point, the origination of the first monad or primordial form. But assuming its existence, they think they can trace out the steps by which all the new species have been derived, one from another, in upward series, and all by natural law. The force of circumstances and natural selection are supposed capable of working out the most marvellous transmutations and adaptations, and there is no longer need of special divine intervention. Indeed it is not necessary that the Deity, if there be one, should have anything to do with the process except, as some would say, originally to ordain the law. And when a man has once brought himself to believe that all the wonderful diversity and mutual adaptation of organic nature have been the result of natural law, independent of any special acts of creative power, he will not long hesitate to adopt the dogma, no more improbable, that the primordial form might have been albumen, vitalized by electricity or some other natural force.

But in spite of the great array of learning which has been adduced of late to sustain this hypothesis, very many who unite good common sense to strong reasoning powers, even though not unwilling to see religion undermined, cannot adopt as truth such dreamy speculations. Others, also, who by the study of the mathematical laws of the universe, have come to the conclusion that special interference with these laws, such as miracles suppose, is impossible, and yet feel the need of something more substantial than the transmutation hypothesis, have tried hard to devise some other mode of explaining the geological creations than by special intervention. At last they have made an appeal to our ignorance of the hidden powers of nature. True, we know of no natural law that can create new species, if we set aside the Development Hypothesis; but there may be some such law among nature's arcana. The fact that these new creations are repeated at intervals, and seem to form a part of a series of operations, which we know to be natural,

makes it quite probable they also are natural. Perhaps this unknown law will by and by be discovered, as many new laws have been to explain phenomena once supposed to be miraculous because anomalous and inexplicable.

We have gone into a somewhat extended examination of this new mode of setting aside the miraculous character of the geological creations. For though put forth hypothetically by most of its advocates, it is obvious that they rest upon it, and that it will undoubtedly become the resort of all who do not like to admit the miracles of successive creations, and cannot adopt the Development Hypothesis. Moreover, some sincere friends of revelation, and perhaps some theologians, have seemed favorable to such views, not aware, we apprehend, that they were thus yielding up the main argument for every kind of miracles.

In discussing this subject we have endeavored to show that the advocates of this hypothesis labor under certain false notions as to miraculous intervention. In the first place, while they admit all that is essential to a miracle in the geological creations, viz. that they cannot be explained by the laws of nature, which indeed they contravene, they think their recurrence at the commencement of the different formations shows them to be subject to law, and that this idea destroys the notion of a miracle. We have replied by maintaining, first, that there is a law of miracles as well as of natural events, and that indeed the Deity never acts without law. But secondly, the geological creations are not exactly alike at different epochs; indeed no creation of this sort has ever been a repetition of one before it. The interval between them has probably never been twice the same, and since the organisms have always been wisely adapted to the changing condition of the world, they never could have been the same at any two demiurgic periods. As the physical character of the world has been constantly improving, so have the animals and plants introduced been advancing from the simple to the complex, and the progress has always been at such a rate as to connect all the minor successive systems

of life into one general system, harmoniously correlated in all its parts, On these several accounts, each creation must have been unlike and independent of all the rest, and therefore corresponding to the more common idea of a miracle, which regards it as an event different from everything that has preceded it.

The vast intervals between these creations should also be taken into the account. They occurred only at the commencement of the geological periods, as most geologists suppose; and who that is familiar with the subject will undertake to tell us their length as measured by years? They must heap myriads of years upon myriads to satisfy the conditions of the problem. If we suppose rational beings to have existed during each life-period, they could have witnessed no repetition of the miracle with which each of those periods was begun, nor have had any evidence, unless revealed by the rocky strata, that it had been manifested in a previous period. Each successive creation must have appeared to such intelligences as an insulated interposition of almighty power, inexplicable by any natural law, and disconnected with anything anterior save divine energy, and therefore miraculous in the strictest sense. And even to a superior being, say an archangel, whose eye could run over the whole range of the successive creations, each interposition, for the reasons that have been given, must appear unlike every other, and therefore in reality an independent miracle.

But it is contended that the connection of these creations with so many series of natural operations affords a presumption that they also are natural. But on what ground is such an inference made? With what else but natural operations can any miracles be connected in this world? Such a connection *alone* enables us to prove that they are miracles, and that they were intended to subserve some benevolent purpose, and to meet exigencies which special divine intervention could alone supply. All the miracles of sacred history are connected in the same manner with natural operations, precisely as are the geological creations, so that

if the latter are on this ground to be denied a miraculous character, the former must share the same fate. This is doubtless just what some who advocate these views are aiming at, but we cannot believe it of all.

But why is it not as reasonable to suppose that some natural law will hereafter be discovered that will explain the geological creations, as it was a half century or a century since, to presume that eclipses, comets, the aurora borealis, and meteoric showers would be found to be the result of some undiscovered natural law? The difference is just here. The geological creations are not merely inexplicable by natural laws, but they contravene or modify those laws, and therefore must be the result of some force coming in to interfere with those laws, or at least to modify their power; whereas the phenomena alluded to show no such interference and want of harmony with nature, and therefore it was reasonable to wait to see if a more thorough acquaintance with the phenomena, and a better knowledge of the more hidden forces, of nature, such as electricity, galvanism, and affinity, would not furnish a rational explanation on natural principles, and the result has in a good measure justified such an anticipation. But what approach has been made, by all the discoveries of modern science, towards solving the phenomena of life and intellect by any natural law? Surely none unless we adopt in full the hypothesis of natural development.

Let us illustrate this subject by an example. The most striking object in the last geological creation was man, with an organization somewhat superior to that of any other animal, and with mental powers far above all others, to which is superadded a moral nature, of which all others are entirely destitute. Geology shows us that man did not exist till a very late period in the world's history; for his remains are found only in Alluvium, and though there is some diversity of views as to the exact part of Alluvium where he is first found, scarcely any one contends that he existed anterior to the alluvial period. All scientific men would agree in say-

ing that he was among the very latest of the animals created, and that none nearer to him in character than the monkey preceded him. He was introduced suddenly in the full perfection of all his powers. Yet man was intimately connected with all the series of organisms that went before him, of whom he was the antitype, and with all the series that have followed. By one of the hypotheses we have been considering, therefore, man's creation should not be regarded as a miracle, but as the result of some unknown natural law. His appearance, although inexplicable by any known law, should be regarded as the first appearance of a comet or a meteoric shower, and we should wait patiently for the physiologists to discover the hidden law of nature by which he was produced.

Now, without saying anything of the biblical history of man's creation, which represents it as the grandest of miracles, is there any man acquainted with the facts of science and the laws of philosophising, who would seriously teach or believe that the creation of such a being might be the result of some unknown natural law? Even though one might imagine some of the lowest forms on the scale of life to have such an origin, yet the case is altered when we have before us a being not only at the head of animal organization, but endowed with lofty intellectual and moral powers. Yet if the other geological creations were not miracles, man's introduction must be placed in the same category. How much more consonant with philosophy and common sense the conclusion that they were all miracles!

This we believe will be the ultimate verdict of science; and certainly that would be a strange theology which should reject the miraculous character of man's creation. For a time, indeed, men of sceptical tendencies, who would gladly see all the miracles of revelation rejected, will strain their ingenuity to wipe them all out from the records of nature. For they know very well that if the latter are admitted, so must the former be, and if the one be rejected, so must the other be. The point in religion which is most vigorously

assailed at the present day is, perhaps, the doctrine of miracles. Scientific sceptics are becoming fully aware of the necessity of making out the geological creations to be only natural events. Hence they resort to the absurd hypotheses that have been described, and which would really be subjects of ridicule were they not seriously propounded by learned men. But somehow or other they must silence the guns which their own labors have helped to place upon the ramparts and to supply with ammunition.

We have little fear, however, that anything more than partial and temporary success will attend this crusade against religion. So far as Christianity is concerned, the doctrine of miracles is indeed *articulus stantis vel cadentis Ecclesiae*. But the geological record is too full and decided to be long obscured and mystified by physiological or transcendental speculations. Miracles! Why all the great chapters of nature's history begin with them, and if the Christian dispensation were destitute of them, it would be out of harmony with the course of things in the natural world. Geology has, indeed, been supposed to lay open a fruitful magazine of weapons for the gladiatorship and tournaments of scepticism. But it is no longer easy to suborn or silence the testimony of that science. Not now throttled in the pillory of false philosophy, nor ventriloquized by a superficial scepticism, its free natural voice is found to blend in wonderful harmony with that of revelation.

Special Providence.

3. Thirdly, this discussion shows us how, in spite of nature's constancy, and without any miracle, God can bring about any event which special providence requires.

Let it be remembered that special providence implies some special arrangements of causes to meet particular exigencies in the condition of living beings. Inorganic natures may furnish the forces which may be made to conspire to a special end, but the object on which they meet is always organic, or rather, it is only those endowed with

life. They may rest on an individual, a family, a community, a nation, a continent, or even all the inhabitants of a world, in distinction from those of other worlds. For the idea of selection is always implied on the part of God. He does something for one individual or race, etc., which he does not do for others; and this constitutes the speciality. The result may be for producing happiness, or for punishment, or for discipline; but it is always for the highest good of the universe. But all such events seem to come in the way of natural cause and effect, and never miraculously. Let us now see what means for accomplishing such ends are afforded by the agencies of change which we have described.

Let us first suppose the Deity standing beside the great machine of the universe, with one eye upon its complicated agencies, and the other upon every individual living being. Suppose his power ready to modify the springs of every movement as his wisdom shall see to be necessary to answer the ends of his special providence. Let him touch only those springs that are out of our sight, and though that would modify those within sight, it would not produce any abnormal action, and therefore there would be to man's view no miracle. If he were, for instance, to change the forces on which molecular action depends, the endless variety of chemical operations around us and within us would be modified, just as far as was necessary; yet we should see no violation of natural law, and suspect no interference. Again, how many secret forces on which vitality and organism depend, might God modify to lengthen or to shorten life, or to increase or diminish its power, and make the body more or less fit for the residence of the soul, and thus accomplish unnumbered ends in his special providence? If desirable, also, he might put forth a secret influence on the human mind, that should shape events unnumbered in human history, and even in nature. Yet here, too, we should see nothing but nature's regular sequence of cause and effect. More especially by modifying the complicated network of influences by which the course and destiny of

organic beings are determined, how easy to accomplish almost every purpose of his special providence, even if all the other means to this end which we have mentioned should fail. This principle, indeed, puts into the divine hand a power to accomplish his providential designs superior to what a constant succession of miracles could give.

But this representation is rather popular than philosophical. A created contriver and designer might thus stand by his machine and alter its parts to improve them or accomplish special ends. But with an infinite Creator everything would be made perfect at the beginning. His first conception of the plan of the world in eternity, would embrace every instance of special providence from first to last, and of course every arrangement and modification of second causes necessary to its perfect accomplishment. How could it be otherwise with a being of infinite knowledge, with whom improvement by an after-thought is an absurdity. He might, indeed, make it a part of his plan to introduce modifications in the second causes, in the manner suggested. Still it would be only the carrying out of his eternal plan. Since, however, such special interventions would be unnecessary, the most probable view is, that the original plan would be so arranged that the wants of every special providence should be met by natural operations.

With many, however, such a view of the divine pre-arrangements seems to bind all events with the iron coils of fate, and to exclude free-agency, and render human efforts nugatory. We do not sympathize with such views, though we do not purpose here to enter into the discussion of such difficult subjects. But we lay it down as a principle, from which it would seem no logical mind could dissent, that when God made the world he must have had a plan of it in his mind; and if so, no event however insignificant could have been excluded, and consequently it must have embraced every act of special providence, and every voluntary effort necessary on the part of the creature. To deny these truths is to fly in the face, not only of philosophy and reve-

lation, but of common sense. We may not be able to see the connection and harmony of these truths with all other principles; but this proves not that they are untrue, but that our faculties are too limited to grasp the whole.

Another common resort of scepticism is, to deny that there is any such thing in the divine government as special providence. Because law controls all events, it is supposed there can be no speciality in any of them.

Strange that any man should have reached adult years, and not have seen enough in his own personal history to satisfy him that an overruling Power had marked out and controlled his condition, and led him in a path which he knew not! Strange that he should not have seen enough in passing events, both in relation to individuals, communities, and states, to prove that an unseen hand was shaping their destinies! Strange that any one can read the past history of individuals and nations, and not see the pillar of cloud and of fire going before them! But alas, how purblind is unbelief! It is difficult for a created being to form a clear idea of the manner in which a plan is formed in an Infinite mind. But let us suppose the Creator, in eternity, to be forming the plan of the universe, as a created mind would do it. He would perceive that certain exigencies in the history of nations, races, communities, and individuals, would need some special provision to bring about these exigencies at the right time and to make them subserve the purposes of happiness or discipline or punishment. Hence all the antecedents of such events would be so arranged by infinite wisdom as would ensure these results; and after they had been brought about, finite faculties would be able to see the conspiracy, in other words, the special providence. Other events in the history of communities and individuals might be important and be made certain in the same plan. But we cannot see what objection there is to the supposition that some, on account of their importance or peculiarity, may have been more specially provided for than others, either in the original plan in eternity or by modifica-

tions in time. Why, then, should we not expect special providences?

The inference we are now dwelling upon, if admitted, casts a bright and pleasant light on the subject of prayer. For an answer to prayer is a special providence, or rather prayer is one of the principal means by which special providence is developed. But how fatal a stab to the comfort of the Christian has often been given by the specious suggestion of scepticism, that prayer for any good dependent upon natural law is useless, because God will not work a miracle to gratify his most loving and devoted child. Nor need he, if our reasoning be correct. For he has only to employ some of the unnumbered agencies of change, which ever stand ready to do his will, and every evil which threatens us will be averted, and every good we need will be bestowed, even though nature's sternest laws must be neutralized. Much specious and subtle reasoning has been employed to undermine and tear away this pillar of the Christian's faith and hope, and to leave him to struggle despairingly in the iron grasp of law and fate. But the principles developed by this discussion rescue him from this gloomy dungeon, knock off the fetters of false philosophy, and bring him into the embrace of a loving Father, who has an ear ever open to his cry, a heart full of compassion, and an arm strong enough for his deliverance in every exigency.

4. Fourthly, we see in this discussion why, in the divine plan of the universe, natural laws are allowed to interfere with one another, and produce irregularities.

Bishop Butler does, indeed, intimate that such interferences may be a necessity in the nature of things. But surely the Deity could have ordained such laws as would not interfere. The result would have been endless uniformity and constancy, unless broken in upon by special miraculous intervention. But, as we have endeavored to show, the interferences in the existing system result in normal change, a higher and more important law than that of constancy; for it is essential to the permanence of the inani-

mate world, and to the happiness of animate creation. To be more specific, four important objects are secured by the interferences of natural laws.

The first is permanence in the planetary and astral revolutions. The minute perturbations, which the struggle between the centripetal and centrifugal forces produce, seem to be the grand means by which the stability of the solar system is secured. But this subject has been so fully considered in another place, that we need not go again into details.

A second important use of this arrangement of laws consists in the means it affords of executing the great designs of Providence without miracles. Man might, indeed, suppose that special intervention would be better. But it would have the inconvenience of leaving us in uncertainty as to what is before us, so that we could lay no plans which we could depend upon, and besides, we could not prepare ourselves for the new exigencies into which miracles might throw us. As it now is we can judge, to some extent, from the past what to expect in future. Yet by means of the complicated net-work of conflicting forces, which we have shown to exist in nature, God can as certainly and surely fulfil his special purposes as by an incessant repetition of miracles. There is not a law of nature which cannot be counteracted, intensified, or diminished in its action, just as much as is ever needed, by a wise arrangement of the various forces in nature on which events depend, and yet everything shall happen in accordance with natural law, without any appearance of counteraction, intensification, or diminution. This is certainly more wonderful than the most complicated system of miracles could be; and it shows how much superior to man's is divine wisdom. We could not imagine beforehand how things so unlike as nature's constancy and special adaptation to every want of individuals, could be reconciled. But the system of interferences among laws is one of the means by which it has been done,

and the history of nations and individuals shows how effectually.

A third important object accomplished by the interferences of nature's laws is discipline. With such natures as we possess, we must either be forced to go through a variety of discipline or be ruined. If the body be not hardened and strengthened by conflict with various natural forces, it will be too feeble and sickly for the dwelling place of a vigorous and healthy mind. So if the mental powers do not have to struggle with cross currents, they can never do anything but float unresistingly down the stream, a mere coiled-up, undeveloped germ. Most of all do the moral powers need to be forced into stern conflict with the various adverse forces that lie, as it were, in ambush along the path of life, and suffer none to pass unassailed. By every assault, if we maintain our ground, our powers are strengthened for meeting stronger enemies, and thus are they fitted at length for every earthly conflict and for a fuller development in a higher sphere.

A fourth important object secured by conflicting laws is the happiness of sentient beings. They produce this result in two ways: the discipline which they impose enlarges the capacity for happiness, and the endless variety which they spread through heaven and earth feeds that capacity to the full. For the love of novelty is one of the strongest passions certainly in the human breast, and its gratification one of the richest sources of enjoyment. But of this we shall speak more fully under our next inference.

Such benefits at least are the result of those interferences and collisions which exist among natural laws, and others doubtless are manifest to higher intelligences. Yet this is a feature in the divine plan that seems at first view a defect in nature. But how obviously it is a mark of consummate wisdom and benevolence.

5. Finally, we have reason to expect that change will continue to be the higher law forever.

Why should it not be? For in this world, thus far, it has

ever been the grand means of happiness. If we look back upon the earth's early history in the light which geology and astronomy cast upon it, we shall see that the result of the mighty changes it has undergone, has been an improvement of its condition; and with this came in an increase of happiness by the introduction of higher natures, capable of greater enjoyment. The Brachiopods, Echinoderms, Crustaceans, and Polypi of the Silurian seas had less capacity for happiness than the fishes of the Devonian period; and these less than the reptiles, fishes, and Cephalopods of the Permian and Triassic eras; and these less than the birds and marsupials of the Jurassic period; and these less than the more perfect mammals of the tertiary aeons; while far above them all stands man with the associated species of the existing creation. From the beginning the capacity for enjoyment, and the number of beings capable of it, have been increasing, so that the tide of happiness has never flowed in so deep and broad a channel as now. Infinite benevolence has ever stood ready to increase the sum of enjoyment as fast as the capacity of the world was enlarged, and that depended upon change.

The variety and beauty of existing nature are dependent chiefly upon chemical and organic changes. And to show how essential these are to human happiness, we have only to take up our abode where almost everything is monotonous and unvarying. Let the day, however beautiful, stretch itself over weeks and months, with the sun in his meridian glory; or, let the most lovely of the seasons become unchangeable; or, let man be made sure that his social condition, however pleasant for the time, admits of no improvement, and you have aimed a fatal blow at human happiness. It needs, in fact, but an imperfect experiment of this sort to convince any one that the physical, intellectual, and moral constitution of man was expressly adapted to change by his Creator, and that this is one of the chief aliments which we crave. Entire monotony is, indeed, the most terrible of all punishments. We should imagine that the slow dropping of

water upon our head would be a trifling matter. But in fact it soon becomes more terrible than the guillotine or the stake.

True, many of the changes witnessed in this fallen world become sad and painful. And we are prone to connect the great and salutary changes of the universe with our own dissolution, and fancy that suns and planets, like our own bodies, are hastening to ruin. With morbid sensibility we exclaim,

“What does not fade?

This huge rotundity we tread grows old,
And all those worlds that roll around the sun; —
The sun himself shall die, and ancient night
Again involve the desolate abyss.”

Oh no! it is not so. Revelation discloses a brighter view. Suns and planets shall not be annihilated, but renovated. There shall be new heavens and a new earth; and judging from what has been on this earth, it shall be a rejuvenated and more glorious world, fit to become the abode of righteousness only, a paradise lovelier than Eden. Our bodies, too, and those of our friends, which must moulder back to dust, shall not sleep in the grave forever, but be raised spiritual, incorruptible, and immortal.

“See truth, love, and mercy in triumph descending,
And nature all glowing in Eden's first bloom;
On the cold cheek of death smiles and roses are blending,
And beauty immortal awakes from the tomb!”

Now, does the analogy of nature allow us to suppose that a principle which has hitherto been mightier than any other in the government and preservation of the universe and in promoting its happiness, will be dropped out from the economy of the new earth? We know, on the testimony of revelation, that this principle will make some of its most wonderful manifestations in bringing forth a new and a spiritual body from the grave, in changing the corruptible into the incorruptible, the mortal into the immortal, and in developing from the ruins of the present world a new

heavens and a new earth wherein dwelleth righteousness. Will God, then, introduce everlasting monotony and permit no changes in heaven? Rather would analogy lead us to conclude that it may be a succession of higher and higher economies of life and enjoyment, into which the law of change shall introduce us. We conjecture not what these new developments may be, nor would we form so low an estimate of that world as to fancy them a repetition of the most beautiful flowers and fruits and gems and landscapes which earth now contains; but rather objects far more attractive and glorious; such as could not be understood and appreciated by our present powers, but such as an infinite God knows how to produce, and such as infinite benevolence will delight to scatter in rich profusion all along the upward pathway of our immortal existence.

ARTICLE III.

DOCTRINES OF THE NEW SCHOOL PRESBYTERIAN CHURCH.

BY REV. GEORGE DUFFIELD, D.D., DETROIT, MICHIGAN.

THE design of this Article is to answer a question often asked: "What is the difference between Old and New school Presbyterians?" Ecclesiastically, they form two distinct and independent bodies. Denominationally, they are known to be prosecuting different and separate interests. Yet they hold the same Confession of Faith; adopt and profess attachment to the same system and form of ecclesiastical government; have the same modes and forms of discipline; and designate themselves by the same popular and corporate name, "the General Assembly of the Presbyterian Church in the United States of America," and seem to be, and to be known in law, as the true and