DARWINISM
AND
TELEOLOGY.

BY
D. MacDILL, D. D., LL. D.

Common Sense and Logic

APPLIED TO

DARWINISM AND TELEOLOGY.

—BY—

Rev. D. MacDill, D. D., LL. D.

PROFESSOR OF APOLOGETICS IN

XENIA THEOLOGICAL SEMINARY,

AND AUTHOR OF "THE BIBLE A MIRACLE," "THE MOSAIC AUTHORSHIP OF THE PENTATEUCH," AND OTHER WORKS.

1899.

MARSHALL & BEVERIDGE, PRINTERS,

XENIA, OHIO.

Preface.

In the following treatise, we employ, in some cases, arguments and considerations that have been employed before, for the reason that we have aimed at fulness of discussion.

Using freely thoughts not original with ourselves, we have endeavored to make, in the proper places, due acknowledgement of our indebtedness to others; but doubtless we have failed in some cases to do so.

Some facts and considerations are introduced more than once, because of their different aspects and because of their bearing on different parts of the general subject.

Contents.

CHAPTER I.

INTRODUCTORY.

SECTION I.—WHAT IS EVOLUTION?

SPENCER defines as follows: "*Evolution is an integration of matter and concomitant dissipation of motion; during which the matter passes from an indefinite, incoherent homogeneity to a definite, coherent heterogeneity; and during which the retained motion undergoes a parallel transformation.*" [1]

It was this famous definition which led the Contemporary Reviewer to remark that "the universe may well have heaved a sigh of relief when, through the cerebration of an eminent thinker, it had been delivered of this account of itself."

One of the objections to this definition is that it represents evolution as a change *always* from the indefinite, incoherent and homogeneous to the definite, coherent and heterogeneous; or, from the simple to the complex. It ignores the backward movement in evolution, though the author has recognized it outside of his famous definition. [2] The fact of degradation in evolution is asserted clearly and fully by other writers. Darwin says:

"Members of a high group might even become, and this apparently has often occurred, fitted for simpler conditions of life; and in this case natural selection would tend to simplify or degrade the organization; for complicate mechanism for simple actions would be useless or even disadvantageous." [3] Prof. Romanes says:

"The facts of deterioration or degeneration may be due either to a passive cessation of selection or to an

(1) *First Principles*, p. 396.
(2) *Biology* Vol. 1, p. 322.
(3) *Variation under Domestication*, Vol. 1, p. 8.

active reversal of it." [1]

Hæckel and Le Conte make similar declarations.

According to Darwinism, the whale and the porpoise are examples of degradation, being descended from terrestrial quadrupeds. Le Conte speaks of whales "coming from land animals by retrograde changes." [2] The serpents that are thought to have rudiments of legs must be regarded as examples of the degradation of legged animals into reptiles.

The definition above quoted is then erroneous, since it ignores the transmutation of the more complex into the more simple, and the higher into the lower. It is further erroneous in this respect that it applies only to *matter*. Evolution is not limited to the material and organic world. It includes in its domain mind, politics, literature, morals and even religion. Spencer himself, in his own book, entitled "*Illustrations of Universal Progress*," says:

"Whether it be in the development of the earth, in the development of life upon its surface, in the development of society, of government, of manufactures, of commerce, of language, literature, science, art, this same evolution of the simple into the complex, through successive differentiations, holds throughout." [3] But government, language, literature, science and art are not material things. Hence to define evolution as a process, involving merely *matter* and *motion*, is a great mistake.

A more accurate and sensible definition, though not so much lauded nor so frequently quoted, may be found, stowed away in the appendix to one of Spencer's volumes, as follows:

"The affirmation of universal evolution is in itself the negative of an absolute commencement of anything. Construed in terms of evolution, every kind of being is conceived as a product of modifications wrought by insensible gradations on a pre-existing kind of being; and this holds as fully of the supposed commencement of organic life as of all subsequent developments of organic life." [4]

According to this statement, it is to be observed, as follows:

1. Evolution is universal, including everything inorganic and organic, every development of physical, intel-

(1) *Darwin and after Darwin*, Vol. 1, p. 270.
(2) *Geology*, p. 529.
(3) *Illustrations of Universal Progress*, p. 3.
(4) *Biology*, Vol. 1, p. 482.

lectual, social, moral and religious life. Even Darwin's four or five primordial forms, and his one primordial form, must be delivered over to evolution. If there is one thing in all the universe not subject to the law of evolution, it is "the inscrutable Power" which figures so largely in the writings of Spencer.

2. According to this definition, everything (except "the inscrutable Power) and every development, material, mental, social, theological and political, was potentially existent in some antecedent, and has been derived from it. This seems to involve an infinite series and the negation of an absolute commencement. Each antecedent is supposed to be derived from a preceding antecedent, and this from another; thus back and back *ad infinitum.*

3. As there has been no absolute commencement, there must have been some time and somewhere an unthinkable process between *nothing* and *something*. How did the lowest existence get started? In order to bridge the chasm between *something* and *nothing*, Spencer seems to be disposed to fall back on the dogma of spontaneous generation. [1] But of this we shall speak hereafter.

Such is evolution as set forth by its most famous exponent and defender.

SECTION 2.—WHAT IS DARWINISM?

Darwinism is the doctrine of evolution applied to plants and animals. Darwin took into view only the *organic* world. His aim was to account for the origin of the various classes of organisms. His hypothesis is that at first only one primordial form, or at most only four or five primordial forms, were created; [2] and that from these, all existing species of plants and animals, by slight changes, continued from generation to generation, and through long periods of time, have been derived. The several points of Darwinism may be stated as follows:

1. The original existence of matter and of four or five primordial forms, or at least of one. Darwin held (at least at the time he wrote the book that has made him famous) that these primordial forms, or the one primordial form, originated by *creation.* His express declaration is that "the first creature, the progenitor of innumerable extinct and living descendants, was created." [3] The idea of

(1) *Biology*, Vol. 1, pp. 486-492.
(2) *Origin of Species*, p. 423. (3) *Origin of Species*, p. 422.

creation is emphasized by the tautology of the expression, "the first *creature* was *created*."

2. From these four or five primordial forms, or from this one primordial form, have descended the multitudinous genera and species of plants and animals that have since appeared upon the earth, both dead and living.

3. The main factor in the evolution of genera and species is *natural selection.*

4. Natural selection involves several facts (real or supposed) as follows:

(1.) Offspring are much like their parents—heredity, inheritance.

(2.) Offspring differ somewhat from their parents—differentiation.

(3.) There is a fierce struggle among the various plants and animals for existence. This struggle for existence results from their rapid increase. That increase being in many cases in a geometric ratio, the world would soon be overstocked if multitudes of plants and animals were not destroyed. Darwinism includes the Malthusian doctrine.

(4.) In the struggle for existence, the weaker individuals, those least adapted to cope with the difficulties of their environment, perish; the stronger individuals, those best adapted to their environment, survive. Or, at least, the stronger individuals live longer and have a more numerous posterity, imparting their peculiarities to them.

(5.) Adaptation to environment depends on heredity and variation. The offspring, that by heredity and variation, possess characteristics most suitable to their surroundings, are the healthiest and longest-lived. These therefore, with such of their offspring as are most like themselves, predominate in their species and give it character. Thus by heredity and variation, the struggle for existence and the survival of the fittest, the species change slightly from generation to generation, and thus become in the end a new species.

5. Another factor in the transmutation of species, according to Darwinism, is *sexual selection.*

Among some species of animals the pairing of the sexes is determined by the size, strength, beauty or other attractiveness of the males. Thus certain qualities of form, structure, or color are perpetuated and intensified, and in time differentiate and characterize the species.

6. *Use* and *disuse* constitute another factor in transmu-

tation. Organs are developed and strengthened by use, but are atrophied and destroyed by disuse. When species migrate, or their environment changes in some other way, organs in some cases become useless, atrophy and disappear. In this way transmutation and the formation of new species are favored or hindered.

Darwinism, then, is the hypothesis that, by means of slight modifications transmitted and accumulating from generation to generation through immense periods of time, all existing species of plants and animals, including man, have descended from a few original forms, or from one, that lived and perished long, long ago.

SECTION 3—THE ORIGIN OF MAN.

If Darwinism be applied to man, the conclusion seems to be quite natural, if not unavoidable, that he is descended from some branch of the monkey species. For although Sir John Lubbock holds that the ant race rank intellectually next to man, yet it is generally admitted that the apes, in their corporeal structure and psychical qualities taken together, differ from men less than do any of the other lower animals. If then man has passed from the lowest condition of animal existence, through various intermediate forms—fish, reptiles, four-footed beasts—on up to his present form and intellectual position, it seems naturally and logically to follow that he has descended from the animals that resemble him most in physical structure and intellectual capacity. If we are to count among our ancestors beings much lower than quadrupeds and reptiles—lower even than tadpoles, fish-worms and tumble-bugs, why should we hesitate to acknowledge ourselves descendants of the monkeys?

As a matter of fact, Darwin maintained that men are descended from the catarhines (perpendicular-nosed monkeys). His views are expressed as follows:

"There can hardly be a doubt that man is an offshoot from the Old World Simian stem; and, under a genealogical point of view, he must be classed with the catarhine division."—"And as man rom a genealogical point of view belongs to the catarhine or Old World stock, we must conclude, however much the conclusion may revolt our pride, that our early progenitors would have been properly thus designated."—"The Simiadæ branched off into two great

stems, the New World and Old World monkeys; and from the latter, at a remote period, man, the wonder and glory of the universe, proceeded." [1]

In view of man's descent as thus set forth, Darwin concludes that the human race began their existence in Africa, the original home of the catarhines. He suggests that man originated in a hot country, where he lost the hairy covering that he inherited from his quadrumanous ancestors. Even the absence of a tail and callosities in men is urged by him as a proof of their Simian descent, on the ground that this peculiarity is common to them and the anthropomorphous apes. He, however, maintains that the absence of a tail in man is only apparent. He gravely argues that the *os coccyx* (termination of the backbone) is a tail, reduced in size by disuse and friction, and thus made rudimentary.

"A tail, though not externally visible, is really present in man and the anthropomorphous apes, and is constructed on precisely the same pattern in both." [2]

In accounting for the diminutive size of the human tail, Darwin suggests that our monkey progenitors rubbed and chafed their tails by sitting on them, and thus wore them off, so as finally to have scarcely any tails at all. It is thus that he accounts not for the absence, but the invisibility of the tail in men and the anthropomorphous apes. [3]

The most of the thorough-going evolutionists entirely agree with Darwin in regard to the Simian descent of man. Prof. Haeckel, of Germany, among other things, says:

"The certain proof of our derivation from tailed catarhini is to be found in the comparative anatomy and the ontogeny of apes and man."—"We must necessarily come to the conclusion that the human race is a small branch of the group of catarhini, and has developed out of long since extinct apes of this group in the Old World." [4]

Haeckel, like Darwin, declares man to be a tailed animal, as follows:

"The rudimentary little tail of man is an irrefutable proof of the fact that he is descended from tailed ancestors." [5]

Huxley utters no word of dissent from the views of

(1) *The Descent of Man*, pp. 153, 155, 165.
(2) *Descent of Man*, p. 58.
(3) *Descent of Man*, pp. 58-60.
(4) *Hist of Creation*, Vol. 2, pp 274, 292. (5) p. 289.

Darwin and Hæckel in regard to the descent of man. He hails with exultation "the admission that there is nothing in man's physical structure to interfere with his having been evolved from an ape." [1] Monkeys of all kinds, apes, chimpanzees, gorillas, gibbons, orang-outangs, catarhines and platyrhines figure in his work entitled "*Man's Place in Nature*," from beginning to end. He concludes as follows:

"Where then must we look for primeval man? Was the oldest homo sapiens pliocene or miocene, or yet more ancient? In still older strata do the fossilized bones of an ape more anthropoid, or a man more pithecoid, than any yet known, await the researches of some unborn palæontologist? Time will show." [2]

It is evident that the only doubt in Huxley's mind in regard to man's descent was as to what kind of ape "the missing link" would prove to be.

Prof. Romanes, of Cambridge University, England, who was a zealous advocate of Darwinism, in his work entitled *Darwin and after Darwin*, speaks of man's descent from monkeys as a constituent part of the doctrine of Darwinism. Some of his declarations are as follows: "Our immediate forefathers, the quadrumana"—"Our quadrumanous ancestry"—"Take for example, the case of monkeys becoming men."—"To return to the case of apes becoming men." He takes up and replies to the question, "Why should not all monkeys have become men?" Like Darwin and Haeckel, he speaks of a rudimentary tail and gives pictured representations of the tail in the gorilla and in man. [3]

The late Prof. Drummond, of Scotland, seemed not to be willing to avow full belief in Darwin's views of man's origin. He remarks that the idea of his Simian descent has told almost fatally against the wide acceptance of the doctrine of evolution. In repelling the sarcasm that Darwinism makes man "a reformed monkey," he says that "it is certainly the fact that man is not descended from any *existing* ape." [4] This accords with the hypothesis that the "missing link," the anthropoid ape that was man's immediate ancestor, is extinct, or at least has not been found, living or dead. But after all this, Prof. Drummond goes the

(1) *Crits. and Address*, p 242.
(2) *Man's Place in Nature*, p. 184.
(3) *Darwin and after Darwin*, Vol. 1, pp. 76, 80, 96, 342, 344.
(4) *Ascent of Man*, p. 78.

full length in asserting man's Simian descent. He quotes, with express approval, the declaration of Prof. Romanes that the embryonic covering called *lanugo*, "appears to be useless for any purpose other than that of emphatically declaring man a child of the monkey." [1] He also, like so many evolutionists, speaks of men as having tails and muscles to wag them. He remarks that "it may seem disappointing to the evolutionist that a distinct external tail should not be found in man." But as a sort of apology for man and a consolation to evolutionists, he states that all the anthropoid apes most allied to man have long since parted with their visible, external tails. He seems to think that evolutionists should be well satisfied that man has even the stump of a tail left, and the muscles to wag it. As a further alleviation of the disappointment, the Professor gives the assurance that the phenomenon of club-foot is another proof of Simian descent. "Club-foot is simply gorilla-foot—a case of the arrested development of a character which apparently came along the line of the direct Simian stock." [2]

Mr. John Fiske, an admirer and follower of Spencer, an ardent champion of Darwinism, and a voluminous author, has much to say concerning the Simian origin of man. He speaks of "the time when men first appeared upon the earth as creatures zoologically distinct from apes" —"the ape-like progenitors of man"—"the human race originating by a slow process of development from a race of non-human primates, similar to the anthropoid apes"— "the marvelous shading off of collective apehood into Deity." [3] He says: "Man is not only a vertebrate, a mammal, and a primate, but he belongs, as a genus, to the catarhine family of apes. And just as lions, leopards, and lynxes—different genera of the cat-family—are descended from a common stock of carnivora, back to which we may also trace the pedigrees of dogs, hyenas, bears, and seals, so the various genera of platyrhine and catarhine apes, including man, are doubtless descended from a common stock of primates, back to which we may also trace the converging pedigrees of monkeys and lemurs until their ancestry becomes indistinguishable from that of rabbits and squirrels." [4]

(1) *Ascent of Man*, p. 94.
(2) *Ascent of Man*, p. 96.
(3) *Cos Philos*, Vol. 2, pp. 291, 322, 419. Excursions, p. 76.
(4) *Destiny of Man*, p. 20.

It is thus that this stalwart and zealous advocate of Darwinism speaks of man's origin. The declaration concerning "the shading off of collective apehood into Deity," seems to suggest the advancement of man's "brother apes," [1] as well as of man himself, toward Deification, and their development hereafter into gods. It is but fair to state, however, that Mr. Fiske holds that evolution has already done its best and can produce nothing higher than man.

Such are the views current among the Darwinists. We do not by any means say that all evolutionists hold these views. Prof. Le Conte is quite shy of this dogma of man's Simian descent. Prof. Gray, of Harvard University, who, according to his own declaration, "is in his own fashion a Darwinian," [2] ventures to affirm that "sober evolutionists do not suppose that man has descended from monkeys." [3] This statement surprises us in view of the facts above mentioned. Were not Darwin, Huxley, Romanes, Drummond, *sober* evolutionists? Prof. Gray himself has said: "The four-handed race will not serve for our forerunners—at least, not until some monkey, live or fossil, is producible with great-toes, instead of thumbs, upon his nether extremities." [4] It was the prevalence of this dogma among Darwinists that led Agassiz to say that "the resources of the Deity cannot be so meagre that in order to create a human being endowed with reason he must change a monkey into a man. This is, however, a personal opinion, and has no weight as an argument." [5]

After all, why should a Darwinian shrink from the hypothesis of man's Simian descent? It is certainly no more dishonorable to be descended from monkeys than from creatures lower than fish-worms and frog-spawn. It is true that a still humbler origin is ascribed to man in the Biblical cosmogony; for fish-worms, frog-spawn, and the lowest of living molecules are superior to particles of dust; and the sacred record declares that "the Lord God formed man of the dust of the ground." But this applies only to man's body. His soul came not from earth, but as a breath from the Lord God. The offensiveness of Darwinism consists in this, that it maintains that man's *soul*, as well as

(1) *Destiny of Man*, p. 29.
(2) *Darwinana*, Pref. p. VI.
(3) *Nat. Sci. and Religion*, p. 101.
(4) *Darwiniana*, p. 92.
(1) *Methods of Study*, Pref. p. 4.

body, had a brutal origin and that he is separated only by one or two removes from the monkeys.

SECTION 4.—IS DARWINISM CONSISTENT WITH THEISM? IS IT CONSISTENT WITH THE BIBLICAL ACCOUNT OF CREATION?

We have no hesitation in answering the first question affirmatively.

The compatibility of belief in Darwinism with belief in Theism is demonstrated by such facts as these: Darwin, at least when he was writing his greatest work, was a thorough-going Theist. In it he repeatedly recognizes creation and the Creator. Many of the most distinguished evolutionists have been or are Theists—Sir Charless Lyell, Lord Kelvin, Prof. Drummond, Prof. Gray, Prof. Le Conte, Prof. Romanes, Prof. Dana, Mr. Fiske,—in fact the great and overwhelming majority of evolutionists. Darwin, Spencer and other evolutionists have urged the acceptance of their hypothesis on the ground that it reflects more honor on God than does the traditional view of special creations, and therefore is more consonant with Theism.

Still further: The doctrine of evolution, or at least a doctrine of evolution, allows the belief that God created and rules the world through secondary causes and natural laws. Christians recognize God as the creator of their bodies, though at the same time they recognize their bodies as having originated, not by immediate, but mediate or derivative creation, which is an evolutionary process. All Christians believe God to be as really and fully the Author of their own bodies as if they had originated like Adam's by special creation. It must be admitted that God operates mainly through secondary causes and natural laws. Only the bodies of the first human pair and the original pairs of other species originated by immediate creation. After these, generation after generation of men and beasts and birds and reptiles and fishes, and of plants also, have originated by evolutionary creation.

The error of some evolutionists consists in pushing the evolutionary idea so far as to exclude special creation entirely. But the doctrine of evolution in itself is not inconsistent with Theism.

But evolution and Darwinism, as taught by Darwin, come into conflict with the Biblical cosmogony at several points.

1. The Bible affirms *the fact and doctrine of special creations.* It declares that the world originated by a special creative act. "In the beginning God created the heaven and the earth." [1] It declares that also man originated by special creation, Adam's body being formed of the dust of the ground and his soul coming as an inspiration from the Almighty. [2] It further declares that the first woman originated by a special creation, Eve being made of a rib taken from the side of Adam. [3] According to the sacred account, the lower animals and plants originated by special creation. For, although plants and land animals were evolved from the earth and aquatic animals were evolved from the waters, yet in all these cases of evolution the fiat of God was the creative cause. The earth had no power in itself to originate vegetables and terrestrial animals, and the water had no power in itself to originate aquatic animals. Though much of the material entering into the composition of the plants and of the bodies of the animals was taken from the water and the earth, the plants and animal bodies were not the result of mere natural laws and forces. But for the Divine fiat and Divine energy which accompanied it, neither plants nor animals would have been produced. Thus, according to the Biblical narrative, both plants and animals and the world itself began by special creation. But evolution and Darwinism, or at least many evolutionists, are altogether opposed to the theory of special creations. Some of the evolutionists and Darwinists are more intolerant of this theory than the advocates of it are of evolution.

2. The Darwinian hypothesis does not accord with the Bible account of the origin of man. Moses teaches that man is distinct from all other earthly beings, and had a distinct origin. According to Genesis, man is not derived, either as to body or soul, from any of the lower animals. The Darwinian notion that the human body is merely an improved brutal form and the human soul the psychical entity that formerly belonged to some beast, reptile, fish, insect or molecule, is altogether excluded.

3. Darwinism is inconsistent with the Biblical account of the origin of woman. According to that account, there was at first but one woman, made out of a rib or lump taken from the side of the man. Darwinism teaches that women, as well as men, were gradually developed out of

(1) *Gen.* 1:1. (2) *Gen.* 2:7. (3) *Gen.* 2:21-2.

lower animals.

4. Darwinism is not in accord with the sacred record in declaring that all existing species have been derived from antecedent species.

We are not sure that the sacred record forbids the notion that one species was ever derived from another. It is not certain that the phrase "*after their kind*," as employed in the first chapter of Genesis, is equivalent to "*according to their species*." [1] It may perhaps mean *according to their nature;* and if so, we do not know that there is anything in the Bible to indicate that no species is ever derived from an antecedent one.

But contrary to Darwinism, the Bible teaches that vegetables, water animals, land animals and man, all originated independently of one another, and at differnt times; plants on the 3rd day (or period); aquatic animals in the 5th period; terrestrial animals (including mankind) in the 6th period. Besides, it is stated in Genesis, that plants and terrestrial animals proceeded from the earth, and aquatic animals from the water. Thus the Darwinian hypothesis that land animals are descended from aquatic animals is set aside, together with the further hypothesis of the descent of all genera and species, living and dead, from one or from four or five primordial forms.

5. Once more: we think it is to be inferred from the sacred record that at first there must have been but a small number of plants and animals.

We think it probable that God called into being only a single pair in each species, just as originally there was but a single human pair. God said to Adam and Eve, "*Be fruitful and multiply and replenish the earth*." [2] A similar command had been previously given to aquatic animals and birds, "Be fruitful and multiply and fill the waters in the seas, and let the fowl multiply in the earth." [3] In regard to terrestrial animals, the same facts are implied, fewness in number at first and adaptation to increase. The Lord did not fill the world with plants and animals at once. Just as there was but one human pair when God gave that first commandment to increase and multiply, so there was, as we understand, but one pair at first in each species of plants and animals. Each pair and

(1) *Gen.* 1:11-12, 21, 24-5.
(2) *Gen.* 1:28.
(3) *Gen.* 1:22.

their descendants increasing in a regular geometrical ratio, as they would do until their vast numbers caused "the struggle for existence" to begin, would in a short time spread over the earth. Huxley furnishes the following calculation: He supposes a plant to yield fifty fertile seeds each year and each seed to produce a fertile plant, the increase being fifty-fold each year. The result is 1,953,125,000,000,000 at the end of the ninth year. If the dry-land surface of the earth is 51,000,000 of square miles, 1,421,798,400,000,000 square feet, and, if one square foot is allowed to each plant, there would be 531,326,600,000,000 fewer square feet than would be required at the end of the ninth year, and more than one fourth of the plants would be without standing room. [1]

A pair of animals increasing at a two-fold ratio every year would, in twenty years, number more than two millions, and in fifty years would number 2 quadrillions, 251 trillions, 799 billions, 813 millions, 685 thousands, and 248. To furnish standing room for such a multitude would require many worlds such as ours,

Such calculations accord with the Divine command given to the newly created species to increase and multiply and fill the earth.

But to return: according to the account of creation in Genesis there was at first but one pair of the human species, and but few of other species, probably but a single pair of each species. But Darwinism teaches that *many* human beings appeared by development at one time and also many individuals of each species in the same way. Thus is shown another divergence between Darwinism and the Biblical cosmogony. Besides, many Darwinists ignore the above mentioned facts in their arguments drawn from the geographical distribution of species.

6. Finally, Darwinism is inconsistent with what the Bible teaches in regard to the origin of human depravity and sinfulness.

The Bible doctrine is that man was created morally perfect, but that through the temptation of an evil agent he transgressed the command of his Creator and thus fell from his sinless and happy condition. This is the teaching not in Genesis alone, but elsewhere in the Bible. "God hath made man upright; but they have sought out many inventions." [2]—"As by one man sin entered into

(1) Huxley's *Origin of Species*, p. 119. (2) *Eccl.* 7:28.

the world, and death by sin; and so death passed upon all men, for that all have sinned." [1]—"For as in Adam all die." [2] But Darwinism teaches that man is in no sense a fallen being; that he has reached his present condition by a continued *ascent* from the very lowest of the lower animals; and that whatever human depravity and original sin there are, have been inherited from lions, tigers and hyenas, or other brutal ancestors.

Let it be observed that in the above discussion we speak of Darwinism as taught by Darwin and leading Darwinists, not as modified and recast by some advocate in order to meet difficulties and objections; as, for example, by Le Conte, who at times seems ready to give up Darwinism, in order to save the general doctrine of evolution. [3]

(1) *Rom.* 5:12.
(2) 1 *Cor.* 15:22.
(3) *Evolution and its Relation to Religious Thought*, pp. 270-1.

CHAPTER II.

DARWINISM NOT YET PROVED.

THE main point to be considered in this chapter is whether Darwinism *is to be accepted as an established* theory, or is to be regarded as *an hypothesis not proved as yet.*

Able men are found on both sides of this question. Prof. Hæckel, of Germany, decides that Darwinism ought no longer to be called an hypothesis, and that whoever still seeks for proofs shows that he does not understand the theory, or that he is ignorant of biological facts. [1] Huxley at one time claimed evolution to be a *demonstrated* theory. [2] Prof. Le Conte "is confident that evolution is *absolutely* certain—certain as the law of gravitation—far more certain." [3] Many other able and distinguished men have expressed similar views.

But many able men, and even some of the most distinguished Darwinists, do not hold these views. Darwin himself, in his "*Origin of Species*," speaking of the difficulties which beset his hypothesis, said: "I can never reflect on them without being staggered." [4] In a later work he wrote in the same modest style, thus: "The principle of natural selection may be looked at as a mere hypothesis, but rendered in some degree probable by what we positively know of variability of organic beings in a state of nature." [5]

Spencer, in comparing the hypothesis of evolution with that of special creations, says of the former: "It has the support of some evidence, instead of being absolutely unsupported by evidence." [6] He says further: "The hypothesis of evolution, then, has direct support from facts which, though small in amount, are of the kind required." [7]

(1) *Hist. of Credtion*, Vol. 1, p. 169.
(2) *American Adds*, Lect. III, p. 71.
(3) *Evolution and its Relation, etc.*, pp. 65-6.
(4) *Origin of Species*, p. 154.
(5) *Variation of Domestica t on*, Vol. 1 p. 9.
(6) *Biology*, Vol. 1, p. 351.
(7) *Biol.* Vol. 1, p. 353.

Without the fear of Hæckel before his eyes, Spencer speaks of evolution as an hypothesis, and we believe he never designates it in any other way.

One of Tyndall's declarations is as follows: "Those who hold the doctrine of evolution are by no means ignorant of the uncertainty of their data, and they yield no more to it than a provisional assent." [1]

One of Prof. Drummond's latest deliverances is as follows:

"No one asks more of evolution at present than permission to use it as a working theory." [2]—"Even were this theory perfected, its first lesson would be that it was itself a phase of the evolution of farther opinion, no more fixed than a species, no more final than the theory which it displaced." [3]

Again Prof. Drummond says in regard to Darwinism:

"There is everywhere at this moment the most disturbing uncertainty as to how the ascent even of species has been brought about. The attacks on the Darwinian theory from the outside were never so keen as are the controversies now raging, in scientific circles, over the fundamental principles of Darwinism." [4]

Prof. Virchow, of the University of Berlin, speaks thus:

"Evidence fails to show that by progressive development an ape can ever become a man.—The verdict is pronounced that all investigation down to the present day has not lead to evidence, but merely to conjecture.—The reserve which most naturalists impose on themselves is supported by the small actual proofs for Darwin's theory.—Facts seem to teach the invariability of the human species and the animal species." [5]

The celebrated Max Müller, of Oxford University England, says: "There is one barrier (between animal and man) which no one has yet ventured to touch—the barrier of language.—Language is our Rubicon and no brute will dare to cross it. [6]—I can imagine, with evolutionist philosophers, that an animal without organs of sense may in time grow into an animal with organs of sense. I can imagine it; it is not utterly inconceivable. But, taking all that is called animal on one side and man on the other, I must call it inconceivable that any known animal could

(1) *Fragments of Science*, p. 162.
(2) *Ascent of Man*, p. 6. (3) p. 7.
(4) *Ascent of Man*, p. 5. (5) *Popular Science*, pp. 13, 50-52.
(6) *Science of Language*, 1st series, p. 23, 354.

ever develop language." [1]

Prof. Whitney, of Yale University, after describing Haeckel as "one of those headlong Darwinians who take the whole process of development by natural selection as already proved and unquestionable, and go on with the fullest and most provoking confidence to draw out its details," proceeds as follows:

"But we cannot think the theory yet converted into a scientific fact; and those are perhaps the worst foes to its success who are over-hasty to take it and use it as a proved fact." [2]

Prof. Goldwin Smith goes only so far as to say that "man, instead of being created out of the dust of the earth by Divine fiat, has in *all probability* been evolved out of it by a process of development through a series of intermediate forms." [3]

Prof. Mivart maintains that evolution is not altogether without obscurities and cannot yet be considered as fully demonstrated; and that "the special Darwinian hypothesis is beset with certain scientific difficulties, some of which are absolutely insuperable." [4] He further declares that natural selection as accounting for the origin of man is "an utterly irrational and puerile hypothesis;" and, that no arguments have been adduced "to make probable his origin from speechless, irrational and non-moral brutes." [5]

Ruskin, in one of his "Lectures on the Relation of Natural Science to Art," given before the University of Oxford, 1871, says: "I have just used the expression, 'had Darwinism been true,' implying its fallacy more positively than is justifiable in the present state of our knowledge; but very positively I can say to you that I have never heard yet one logical argument in its favor, and I have heard and read many that were beneath contempt.' " [6]

Prof. Gray, of Harvard University, holds Darwinism as a provisional hypothesis, and proclaims himself "in his own fashion a Darwinian." [7] Yet he declares it to be "unproven and cumbered *prima facie* with cumulative im-

(1) *Lects on Darwin and Philos of Lang.* Eccl. Mag. July,. 1873, p. 154.
(2) *Oriental and Linguistic Studies*, pp. 293-4.
(3) *Lectures and Essays*, p. 89.
(4) *Genesis of Species*, p. 4.
(5) *Lessons from Nature*, pp 185-6.
(6) *The Eagle's Nest, Ten Lectures* &c., p. 156.
(7) *Darwiniana*, Pref. p. vi.

probabilities," [1] but notwithstanding as "not unlikely to be largely accepted long before it can be proved." [2] He further declares that, as compared with the Nebular hypothesis, "evolution is more complex, loose and less provable." [3]

Prof. Jevons, of University College, London, says: "The theories of Darwin and Spencer are doubtless not demonstrated; they are to some extent hypothetical, just all the theories of physical science are to some extent hypothetical, and open to doubt." [4]

From the above presentation of the views of scientists, many of them evolutionists, it may be inferred that the evidence for Darwinism is not so clear and convincing as some of its more ardent advocates suppose. It may be further inferred that the fact that a man rejects Darwinism, or hesitates to accept it as an established theory, does not prove him to be either ignorant, irrational or perverse. The intolerant and denunciatory spirit and tone of some Darwinists are *un-Darwinian*, and unfit them to be either witnesses or judges in the case. Of this class is Prof. Hæckel, of Jena. In the language of Prof. Whitney, of Yale University, "This gentleman, particularly, appears to be one of those headlong Darwinians who take the whole process of development by natural selection as already proved and unquestionable, and go on with the fullest and most provoking confidence to draw out its details." [5] Hæckel denounces not only the theologians, but also the speculative philosophers, the majority of the naturalists, including the zoologists and entomologists, for their rejection of Darwinism; and, among other things, he charges all these classes with superstition and shameful ignorance. [6]

Mr. John Fiske is another of the confident and dogmatic champions of Darwinism. He assumes and asserts that the evidence in its favor is indubitable and overwhelming. In order that our readers may judge for themselves of the spirit and tone of this controversial and voluminous writer, we present some specimens of his style. Prof. Mivart, who ventured to make some criticisms ad-

(1) *Darwiniana*, p. 109.
(2) " p. 54.
(3) *Natural Science and Religion*, p. 61.
(4) *Principles of Science*, p. 762.
(5) *Oriental and Linguistic Studies*, p. 293.
(6) *History of Creation*, Vol. 1, p. 294.

verse to Darwinism, was assailed by him in varied pharses and imputations, such as, "not commendable for scientific spirit"—"not a disinterested student of nature"—"real genius for twisting things"—"unintelligent study"—"cantankerousness"—"want of sagacity"—"guilty of remarks much better befitting ignorant priests." [1] Such is the style in which Mr. Fiske almost invariably refers to Prof. Mivart, who though in some sense an evolutionist, rejected some of the points and proofs of Darwinism. Yet the distinguished Huxley classed Mivart with A. R. Wallace, declared them both to be men of "acknowledged scientific competence," and commended them for "giving an attention, as rare as it is needful, to the philosophical questions which underlie all physical science." [2]

Mr. Fiske has also a special dislike for theologians, except for the few whose views coincide with his own. Fiske himself is an intense theologian. Theology seems generally to be uppermost in his mind. He often assails the current theology. At one time he declares it to be derived from polytheism; at another he affirms that it is descended from fetishism; at another, he oracularly decides that it is fetishism itself. His favorite theologians are Spinoza, Göthe, Lessing and Strauss. For such theologians as Augustine, Luther, Calvin, Knox, Edwards, Pascal, Paley, Chalmers, McCosh, and indeed for theologians in general, he again and again manifests his dislike and aversion. His writings abound in such declarations as the following: "thoughtless remark sometimes heard from theologians and penny-a-liners"—"this kind of misrepresentation is dear to theologians"—"intense hostility which all consistent theologians feel toward Mr. Darwin"—"Idealists, Positivists, theologians and penny-a-liners"—"natural theology is fetishism."

Thus writes Mr. John Fiske, author of "Cosmic Philosophy" and various other books. The thought of Prof. Mivart and theologians seems to fill him with aversion and impatience. He is a man of strong predilections and antipathies. He is by nature a dogmatist. His forte is assumption and asseveration. His most frequent argument is to affirm that a thing has already been proved and is indisputable. He often refers to matters in one of his books as having been established and settled in others. Though

(1) *Cosmic Philos* Vol. 2. p. 475, et passim.
(2) *Critiques and Addresses*, p. 219.

he is a man of intelligence and ability, yet his strength and charm as a writer and speaker result mainly from his cool assumption and unmitigated dogmatism. After all, such qualities, if real talents are not entirely wanting, make a man interesting and attractive. We further note that though Mr. Fiske declares those who do not accept evolution to be ignorant, lacking in mental discipline, blinded by "theological fetishism," and led by "priests, theologians and penny-a-liners," he nevertheless after all admits that evolution at the present time "is the possession of only a few disciplined minds." [1]

We conclude that Mr. John Fiske lacks the judicial mind; and that, though he may be a formidable champion in the arena of debate, he is not fitted to weigh evidence and argument. That such a one should declare evolution to be proved and established is not surprising nor of much consequence.

We have referred to Prof. Le Conte as holding and affirming that "evolution is certain—certain as gravitation; nay, more certain than gravitation." Thus he teaches in his book published in 1897. [2] But in a former book, published in 1874, he teaches very differently. In this earlier book he propounds the doctrine (though he admits that geology, the only witness in the case, seems to teach otherwise), as follows: "Now, of the various conceivable secondary causes and processes by means of some of which we must believe species originated, by far the most probable is certainly that of evolution from other species. This, be it observed, is by no means proved." [3]

When Le Conte declared that "evolution *is by no means proved*," he was, as he is now, professor of geology in the University of California, an able, scientific and cultured man. And there are yet many scientific and cultured men, evolutionists too among them, who, as we have shown, believe and maintain that evolution is by no means *proved* and is only an hypothesis. All these, together with his former self, must Prof. Le Conte virtually charge with some degree of blindness or perverseness, when he today affirms that evolution is *absolutely certain*.

Huxley, as we have said, at one time claimed that evolution had become an established theory. He claimed

(1) Cosmic Philos. Vol. 2, pp. 271-4.
(2) *Evolution and its Relation to Religion*, pp. 65, 66.
(3) *Religion and Science*, p. 23.

for it even demonstration. [1] But there are several considerations which detract from the value of his testimony in the case.

1. At the very time he put forth this claim, he enervated the word *demonstration* by the declaration that "the occurrence of historical events is said to be demonstrated when the evidence that they happened is of such a character as to render the assumption that they did not happen in the highest degree improbable." [2] This is a circuitous way of saying that an historical event is demonstrated by proving it to be in the highest degree probable. But the highest degree of probability is not *demonstration*. Evidently Mr. Huxley wished to say that evolution had been demonstrated, or is demonstrable, though he knew that the evidence was not sufficient to produce demonstration in the usual and proper meaning of the word.

2. Huxley in matters of opinion was of a dogmatic and imperious disposition. President Porter rightly applied to him Rev. Sidney's Smith's description of Macaulay—"*cock-sure of everything*." Such a man can hardly hold anything as a mere hypothesis for any considerable time. He is pretty sure, after using it as a working hypothesis for a short time, to begin to insist that it has been proved and established as a theory; and a little further on he is prepared to maintain that it has been *demonstrated* and is no more to be called in question or doubted than a proved proposition in geometry.

3. In claiming evolution to be conclusively established by proof, Huxley went back on his own dreclarations: "If it (Darwinism) fails to explain any one phenomenon, it is so far weak, so far to be suspected; though it may have a perfect right to claim provisional acceptance." [3] Now heredity, variation, extinction of species, infertility of hybrids, fertility of mongrels, Darwinism does not explain, as Huxley well knew. Again, he declared: "Our acceptance of the Darwinian hypothesis must be provisional so long as one link in the chain of evidence is wanting and so long as all the animals and plants certainly produced by selective breeding from a common stock are fertile and their progeny are fertile with one another, that link will be wanting." [4] He further said, "I adopt Mr. Darwin's

(1) *American Adds.*, Lect. III, p 71.
(2) *American Adds.*, Lect. III, p. 71.
(3) *Man's Place in Nature*, p. 127.
(4) *Mans Place in Nature*, p. 127.

hypothesis, therefore, subject to the production of proof that physiological species may be produced by selective breeding." [1] As is well known, and as must be admitted, the conditions thus required have not been fulfilled, nor the evidence, thus demanded, produced. According to the conditions and tests proposed by Huxley himself, evolution is not an established theory, but remains to this day an unproved hypothesis.

A consideration of the kind of evidence offered in support of evolution and Darwinism tends to the same conclusion.

It has sometimes been claimed that the evidence is inductive. Induction may be and indeed is employed in the establishment of some subordinate points involved in the discussion; but, from the very nature of the case, in reference to the main question, no inductive arguments are employed or can be employed. No one presents or can present an example of transmutation. No one has seen or claims to have seen an animal or plant changed from one species to another. Examples of the production of varieties are cited. But varieties or breeds are not species. It is indeed argued that as new varieties or breeds are frequently produced, so also new species are or may be produced; or that varieties will become new species, if only sufficient time is allowed. But such reasoning is not *inductive*, but analogical. The arguments employed in support of Darwinism are pretty much all of the latter kind. Analogical arguments are not entirely without force. They prove possibility, sometimes some degree of probability, but are not *conclusive*. [2] Darwin himself says, "Analogy may be a deceitful guide." [3] The Darwinist being thus without any examples of observed transmutation and therefore without inductive evidence,—recognizing analogical reasoning as at best inconclusive, and sometimes as fallacious,—is under the necessity of employing inferences, probabilities and conjectures in support of his views. The advocates of Darwinism deal much in this kind of argumentation.

The remainder of this chapter will be devoted to the illustration of this point. We begin with the loose reasoning of Darwin. We admire him indeed for his great

(1) *Man's Place in Nature*, p. 128.
(2) See chapter IX, p. 479.
(3) *Origin of Species*, p. 419.

candor, his keenness of observation and his inductive power. But his reasoning often involves much assumption, imagination and conjecture. Thus, within the space of one page, we have the following statements: "There *seems* to me to be *no great difficulty in believing* that natural selection has actually converted a swimbladder into a lung.—*I can indeed hardly doubt* that all vertebrate animals having true lungs have descended by ordinary generation from an ancient prototype, of which we know nothing.—We *can* thus, as I *infer* from Prof. Owen's interesting description of these parts, *understand* the strange fact.—But *it is conceivable* that the now utterly lost branchiæ *might have been* gradually worked in by natural selection for some quite distinct purpose.—*It is probable* that organs which at a very ancient period served for respiration have been actually converted into organs of flight.—It is so important to bear in mind *the probablity of* conversion from one function to another, that I will give one more instance. —Now I *think* no one will dispute that the ovigerous frena in the one family are strictly homologous with the branchiæ of the other family.—Therefore *I do not doubt* that little folds of skin have been gradually converted by natural selection into branchiæ." [1]

Let the reader observe however many assumptions, conjectures and uncertainties are introduced into this passage: "*seems to be no great difficulty in believing—I can hardly doubt—we can understand—as I infer—it is conceivable—bear in mind the probability—I think—I do not doubt.*" And all this within the brief space of one page. Possibly some one is ready to suggest, by way of excuse for such illogical argumentation, that when Darwin thus wrote, he was struggling with "the grave difficulties which, whenever he reflected on them, made him stagger," [2] and, that he was endeavoring merely to indicate the *possibility* of natural selection. This plea might perhaps be accepted as a palliation were it not for the fact that the same loose and illogical argumentation appears elsewhere. Thus assumption and conjecture with doubt and uncertainty characterize Darwin's account of the origin of man.

"The most ancient progenitors in the kingdom of the vertebrata, at which we are able to obtain an *obscure glance*, *apparently* consisted of a group of marine animals resem-

(1) *Origin of Species*, pp. 171-2.
(2) *Origin of Species*, p. 154.

bling the larvæ of existing Ascidians. These animals *probably* gave rise to a group of fishes as lowly organized as the lancelet; and from these the Ganoids, and other fishes like the Lepidosiren, *must have been* developed. From such fish a very small advance *would carry* us on to the Amphibians. We have seen that birds and reptiles were once intimately connected together; and the Monotremata now connect mammals with reptiles in a *slight* degree. But *no one can at present say* by what line of descent the three higher and related classes, namely mammals, birds and reptiles, were derived from the two lower vertebrate classes, namely Amphibians and fishes. In the class of mammals, the steps are *not difficult to conceive* which led from the ancient Monotremata to the ancient Marsupials; and from these to the early progenitors of the placental mammals. We *may thus ascend* to the Lemuridae; and the *interval is not very wide* from these to the Simiadæ. The Simiadæ then branched off into two great stems, the New World and Old World monkeys; and from the latter, at a remote period, man, the wonder and glory of the universe, proceeded." [1]

Let the reader observe that in this account of man's descent from molecules resembling the larvæ of bottle-like mites, almost every sentence contains a term indicative of mere inference, of assumption or conjecture—"*obscure glace—apparently—probably—must have been—a very small advance would carry us—no one can say by what line of descent—the steps not difficult—we may thus* ascend to the Lemuridæ—interval not *very wide* to the Simiadæ." Darwin was very sure, however, that man proceeded from the Old World monkeys, and that if any single link in the preceding chain of descent had never existed, man would not have been what he now is. [2]

If it should be asked why a man so candid and able as Darwin would deal so largely in assumption and loose argumentation, it may be replied, that being fascinated with the hypothesis of natural selection he deemed it necessary only to prove the *mere possibility* of the origin of the human race and other species in that way.

Doubtless, in the opinion of some, we shall be guilty of intolerable presumption in speaking of the argumentation of Spencer as loose and illogical. For he is regarded

(1) *Descent of Man*, pp. 164-5.
(1) *Descent of Man*, p. 165.

by many as possessing angelic intellect. He has been declared the greatest man in modern times, superior even to Newton. To those, however, who regard criticism of him as near of kin to sacrilege, we commend the estimate of him presented in Darwin's *Life and Letters*. Darwin wrote as follows: "I feel rather mean when I read him. I could bear and rather enjoy feeling that he was twice as ingenious and clever as myself; but when I feel that he is about a dozen times my superior, even in the master art of wriggling, I feel aggrieved. If he had trained himself to observe more, even at the expense, by the law of balancement, of some thinking power, he would have been a wonderful man."

And again: "Such parts of H. Spencer as I have read with care impress my mind with the idea of his inexhaustible wealth of illustration, but never convince me; and so I find with others." Once more: "With the exception of special points, I did not even understand H. Spencer's general doctrine; for his style is too hard for me." [1]

The artful wriggling, and the hard style with its consequent obscurity, which Darwin thus attributes to Spencer, are exemplified in his wonderful definitions. One of these, his definition of evolution, we have already quoted. His definition of life is as follows: "The definite combination of heterogenous changes, both simultaneous and successive, *in correspondence with eternal coexistences and sequences*." [2]

After all Darwin expressed great admiration for Spencer as being a wonderful man. We too admire him; we admire even his definitions. But we are now chiefly concerned with the character of his reasoning. Darwin declares it to have been to himself and others unsatisfactory and unconvincing. Spencer handles facts with the art and skill of a dialectician. Even when engaged apparently in an inductive process he substitutes his own inferences, exaggerations, extenuations and assumptions for facts.

Take his chapter on Genesis as an example. [3] In this chapter we have a careful presentation neither of facts, deductive inferences, nor analogical suggestions, but such statements as the following: "*There is reason to think* that among the lowest Protozoa, etc.—*We have good evidence*

(1) Darwin's *Life and Letters*, Vol. 2, pp. 239, 301, 371.
(2) *Biology*, Vol. 1, p. 74.
(3) *Biol.* Vol. 1, p. 219-223.

that the union, etc.—The marvelous phenomena *naturally suggest the conception*—It *seems* obvious that this mysterious power—*And if* these compound units, *if* under fit conditions, they manifest such power—*Then it becomes clear*—The same generative agents appear to be merely modified epithelium-cells—It *appears*, too, that in a succulent English plant—Sundry facts *tend likewise to show*—The evidence *goes to show*." [1]

Thus our celebrated philosopher goes on and on filling page after page with ideas, inferences and opinions that rest at best on mere probabilities, often on conjectures. Such argumentation would be damaging to the reputation of almost anybody but that of so distinguished a speculatist.

Even Huxley, keen and incisive though he was, often manifested a readiness and talent for making his own inferences and beliefs do service instead of facts. In his monogram on palaeontology and evolution, he largely does this, as follows:

"Is it not probable, then, if we go back to the Eocene epoch, we shall find some quadruped related to the Anchitherium? I *think* this desideratum is very nearly, if not quite, supplied by Plagiolophus.—It would be *hazardous to say*—But I do not *think* there can be any *reasonable doubt* —If the *expectation* raised by the splints of the horses.—I *could* as soon admit special creation, at once, as *suppose* that the Perissodactyles and Artiodactyles had no five-toed ancestors.—*If*, as there is *great reason to believe*, true birds existed in the Triassic epoch.—In fact there is even at present *considerable ground for suspecting* the existence of Dinosauria in the Permian formations." [2] Thus this able and distinguished scientist in his inductive argumentation did not restrict himself to facts ascertained by actual observation, but took in as facts things merely *inferred, believed, conceived, expected, supposed, and even suspected.* He also displayed talent and facility for founding sweeping conclusions on mere hypotheses. Speaking of the fundamental proposition of evolution, he said: "That proposition is that the whole world, living and not living, is the result of mutual interaction, according to definite laws, of the forces possessed by the molecules of which the primitive nebulosity of the universe was composed. If this be true,

(1) *Biology*, Vol. 1, pp. 219-222.
(2) *Critiques and Adds.*, pp. 195-199.

it is no less certain that the existing world lay, potentially, in the cosmic vapour; and that a sufficient intelligence could from a knowledge of the properties of the molecules of that vapour, have predicted, say, the state of the Fauna of Great Britain in 1869, with as much certainty as one can say what will happen to the vapour of the breath in a cold winter's day." [1]

In mere style, the first part of this passage is about equal to anything written by Spencer.

Mr. Fiske is an admirer of Spencer, and has evidently been influenced by some of his worse as well as better qualities as a reasoner. We note within a very brief space of "the *Cosmic Philosophy*" such symptomatic expressions, as the following:

"*Must* go on with increasing rapidity—*must* be much more conspicuous—Long ages must have elapsed—Would appear still to be impossible—We can see how was followed."[2] All this, together with the abundant use of *impossible*, *unimaginable inconceivable*, is decidedly Spencerian in style and spirit.

RECAPITULATION.—We have presented in the preceding part of this chapter, the following points:

1. Many of the most distinguished scientists have declared the evidence as yet adduced in favor of evolution to to be insufficient to *prove* and *establish* it as a theory. Many of these are evolutionists, believing that evolution will be proved by further investigation, but holding it at present only as a provisional hypothesis. Evolutionsits may be divided into three classes with reference to the question in hand:

(1.) Headlong evolutionists (to use Prof. Whitney's phrase), like Hæckel, Romanes and Fiske, who accept evolution fully and absolutely, as proved beyond all reasonable doubt.

(2.) Men like Huxley and Le Conte, who are or have been on both sides of the question as to the status of Darwinism.

(3). Evolutionists, like Tyndall, Virchow, Mivart, Gray, Drummond, Whitney and many others, who accept evolution as an *unproved* hypothesis. This is much the largest class. Even Spencer continues to call evolution an hypothesis.

(1) *Critiques and Adds.*, p. 272.
(2) *Cosmic Philos.*, Vol. 2, pp. 292-3.

2. There is no inductive proof adduced in support of evolution and Darwinism. This is not the fault of the advocates of these hypotheses. They do not adduce such evidence because there is none to adduce. No one has ever observed the change of an old species into a new one. From the nature of the case, there can be no inductive evidence; in fact, no positive evidence at all in favor of evolution. The evolutionist must rely on argumentation restricted to deductive inferences, analogies and probabilities, each mode of reasoning involving more or less of uncertainty and doubt.

3. As a matter of fact, the ablest and most distinguished Darwinians—Darwin, Huxley, Spencer and others, even when claiming and endeavoring to deal with facts, have dealt largely with probabilities, assumptions, and doubtful inferences.

In view of such facts it seems to us not unreasonable to doubt the doctrine of evolution, and to regard and treat it, not as a proved theory, but a mere hypothesis.

CHAPTER III.

THE INVARIABILITY OF SPECIES.

We propose to prove in this chapter that *species have been and are unchangeable.*

We do not use the word unchangeable in an absolute sense. We simply deny that species change in the Darwinian sense. Our proposition is that *one species* is not transmuted into another. In arguing this question, we shall largely employ facts conceded by the ablest and most distinguished Darwinists.

1. We hold that our proposition is established by the fact that there are *clear examples of the absolute permanence of species, and not one clear and admitted case of transmutation.*

By the absolute permanence of species, we mean that some species have existed through all the geological ages—through all the millions and millions of years of geologically recorded time. This fact is conceded by the most distinguished Darwinists. It is virtually admitted by Darwin himself, in his demands for "vast periods of time," "enormous intervals" for the operation of natural selection. He speaks of natural selection being at work for a thousand, ten thousand, even fourteen thousand generations. He brings in the chronological hypothesis of three hundred millions of years. Added to all this, he speaks of only a few species undergoing change at one and the same time. His notion is that while a few species are being transmuted, all the rest are stationary. But as the process of transmutation requires countless ages—"enormous intervals of time"—out of thousands of species there must be some whose turn has not yet come for the beginning of the change. [1] Thus the facts as presented, or at least imagined by Darwin, involve the immutability of many species, if not of some individuals of every species. We know indeed that Darwin said that those species which do not

(1) *Origin of Species*, pp. 400, 403, 95, 101.

change will become extinct. [1] But in regard to this matter of permanency of species, he made the following express declaration: "Both single species and whole groups of species last for very unequal periods; some groups, as we have seen, having endured from the earliest known dawn of life to the present day; some having disappeared before the close of the Paleozoic period." [2] As an example of this unending persistence of species through all geological periods, he refers to the genus Lingula, species of which (he declares) "must have continuously existed by an unbroken series of generations from the lowest Silurian to the present day." [3] Thus we have the testimony of Darwin to the fact that some species have existed without change from the earliest known dawn of life down to the present time. Spencer makes similar admissions. He says: "Some few species, and a good many genera, have continued throughout the whole period geologically recorded." [4] He also speaks of "the types that have persisted from ancient eras down to our own era." [5]

Le Conte admits that not only a few, but that most species are permanent. He says expressly: "In evolution *all* species do not change. * * * Only the more plastic forms change into other species." [6]

We thus prove that there are clear examples of the absolute permanence of species, by the testimony of Darwin, Spencer and Le Conte, three very competent and trustworthy witnesses to establish a fact of this kind.

This admitted fact is an important one. For this admitted immutability of some species, this persistence of some species through all ages, from the first known dawn of life on down to the present time, this permanence of some species through the revolutions and changes of all geologically recorded time, certainly is presumptive proof that all species are permanent. Suppose that the case was reversed, and that it was clearly proved and on all hands admitted that some species have been transmuted, and that it could not be proved that a single species has persisted unchanged from one geological epoch to another; most assuredly the Darwinists would in such circumstances claim, and they would have a right to claim, that all opposition

(1) *Origin of Species*, p. 275.
(2) *Origin of Species*, p. 278.
(3) *Origin of Species*, p. 277.
(4) *Biology*, vol. 1, p. 322. (5) p. 327.
(6) *Evolution in its Relation to Religious Thought*, pp 2667

to their hypothesis should cease. Why, then, should the double fact that some species are permanent, and that it is not in evidence that a single species has ever been transmuted, not be accepted as conclusive?

2. But we have another proposition to advance in regard to this subject, and it is this: that, according to the showing of Darwinists, *the stability of species is the general rule, and transmution the exception.*

We have shown by the testimony of Darwinists that some species are in fact permanent; we will next show by the same kind of testimony that *most* species are *permanent*, and that transmutation, if it takes place at all, is *exceptional.*

This is proved by the declaration of Darwin, already quoted, that "only a few species are undergoing change at any one period." [1] Let it be noted what this declaration involves. Of the 2,000,000 of species now existent only a few are changing, while the rest are stationary. This is true of the past, as well as of the present. Of the 8,000,000 of species of the past, only a few at any one period were undergoing change, while the rest were stationary. But as transmutation requires enormously long periods of time, permanence must have characterized the great majority of species in the past as well as in the present. Accordingly, Darwin further says: "And of the species now living very few will transmit progeny of any kind to a far distant futurity; for the manner in which all organic beings are grouped shows that the greater number of species of each genus, and all the species of many genera, have left no descendants, but have become utterly extinct." [2]

Thus Darwin held that few species undergo change at any one period, the great majority being stationary; and that few species will have any progeny, the great majority becoming extinct, without leaving descendants of any kind. According to these facts, permanence is the general rule and transmutation the exception.

Huxley expressed similar views. In 1862, in speaking of "persistent types", he declared the total change that has taken place in the different species of plants and animals to be *astonishingly small*, and that an impartial survey of the positively ascertained truths of palæontology *negative* the common doctrines of *progressive modifica-*

(1) *Origin of Species*, p. 401.
(2) *Origin of Species*, p. 423.

tion. He admitted indeed that among the *vertebra* there are a *few* examples of progression, but *denied* the existence of such examples among the animals of *any* of the other branches—Mollusca, Articulata and Radiata. [1] In 1870 he revised these statements and somewhat modified them. But, though he softened his former severity of style, he adhered *substantially* to the *ideas* expressed by him eight years before. He made the following declaration: "The significance of persistent types, and of the small amount of change which has taken place even in those forms that can be shown to have been modified, become greater and greater in my eyes the longer I occupy myself with the biology of the past." He further declared that only in the *higher* vertebrata, "the results of recent investigations seem to me to leave a clear balance in favor of the doctrine of the evolution of living forms one from another." [2]

Thus we have the testimony of Huxley to the stability of animal species in general. He declares that evidence of evolutionary change is found only among the *higher* vertebrata, and that permanence has characterized the great majority of species, including Mollusks, Articulates, Radiates and lower Vertebrates in all past time.

Spencer, though he refers approvingly to Huxley's views as presented above, seems disposed not to admit even the evidences of the slight modification as claimed by Huxley. He virtually declares that divergence and progression are not proved. He quotes Huxley's declaration: "Any admissible hypothesis of progressive modification must be compatible with persistence without progression through indefinite periods." He further declares that "the appearance of progress may be, and probably is, mainly illusive"; that the change from lower to higher types in successive strata may "indicate nothing more than successive migrations from pre-existing continents," and, that "while the evidence usually supposed to prove progression is thus untrustworthy, there is trustworthy evidence that there has been, in many cases, little or no progression." He finally divides types into two classes: (1st), the types that have persisted from ancient eras down to our own era; (2d), types that have from time to time made their appearance in the ascending series of strata types, of which some are lower and some higher than the types previously re-

(1) *Lay Sermons*, pp. 216, 224, 225.
(2) *Critiques and Addresses*, pp. 184, 186, 187.

corded. With regard to the latter class of types, he declares that the evidence does not enable us to say whence they came, and whether any of them arose by divergence from the previously existent types. [1] Thus Spencer teaches that, among animals, there are persistent types, species that have remained unchanged and unchanging from ancient eras to present times; and that, as to other types, the evidence does not indicate whether they originated by transmutation or otherwise.

In this we have the admission, that, so far as the evidence goes, it proves that species have been permanent, and that if the origin of species by divergence be accepted at all, it must be accepted without evidence. It seems to us that Spencer thus gives a deadly blow to Darwinism.

Le Conte is very emphatic and thorough-going in his admission of the actual permanence of a majority of species, as follows:

"In evolution *all* species do not change. On the contrary, most become rigid and either remain unchanged, almost indefinitely, or else die out and leave no descendants. Only the more plastic forms change into other species, but usually into several other species, and thus the number of forms may be undiminished, even though the larger number of old forms leave no descendants. It is true, therefore, of this as well as of other epochs, that the greater number of species are permanent." [2]

This declaration needs no comment. The distinguished author is an evolutionist.

Prof. Dana, though he takes the ground that "no species of animal survived from the beginning of life on the globe to the present time," [3] yet refers to the stability and persistence of species, thus: "The same grander types of structure that appeared in the Silurian age continued to be the grander types through all subsequent time." And again: "Peculiarities in Fauna and Flora of a continent or region continue on through successive geological eras." [4]

We think the above testimonies and statements of fact, by the most distinguished Darwinists, justify our proposition that, according to Darwinism, the great majority of species are permanent, and that transmutation is

(1) *Biology*, vol. 1, pp 323 327.
(2) *Evolution and its Relation to Religious Thought*, pp. 266-7.
(3) *Text Book of Geology*, p. 382.
(4) *Manual of Geology*, pp. 594, 599.

exceptional.

3. Another fact conceded by Darwinists is that *only part of a species is ever transmuted.*

According to Darwinism, as above shown, not only is natural selection exceptional in this regard, that it transmutes only a comparatively few species, but it is further exceptional in regard to the *individuals* of the few species which it transmutes. Indeed, according to Darwinism, natural selection does not operate on *species* at all, but on *individuals*, changing never one *species* into another, but only *some individuals* of a species into a new species, or into several new species.

We have not indeed observed that Darwin *expressly* recognizes the fact that only *some individuals* of a species are ever changed into a new species, but this notion is often *suggested* by him. Take the following declarations as examples. Having spoken of the extreme slowness of natural selection as often depending on local influences and on immigration, he says: "But the action of natural selection will probably still oftener depend on some of the inhabitants becoming slowly modified." [1] And again: "Hence the improved and modified descendants of a species will generally cause the extermination of the parent species." [2] He goes still farther: "New and improved varieties will inevitably supplant and exterminate the older, less improved and intermediate varieties." [3]

In these, and many similar declarations, it is taken for granted that only *some* individuals or *some* varieties of a species are ever transmuted, and that no species *as a whole* is ever changed into another species. These declarations assume that when a new species arises, the old species still persists, its individuals and varieties being merely reduced in number by the transmutation that has taken place.

These declarations further assume that the persisting individuals and varieties must perish. This affirmation, that persisting individuals and varieties must perish, illustrates how even Darwin, a man truly admirable for his intellectual gifts, could, in advocating his views, indulge in imaginative speculations in defiance of the plainest facts, even facts recognized by himself. He maintained that men are descended from the catarhine monkeys, but he

(1) *Origin of Species*, p. 101. (2) p. 280.
(3) *Origin of Species*, p. 408.

well knew that the catarhines were not exterminated. He supposed that the whales are the descendants of black bears, but he well knew that the whales did not kill off their ancestors, and that black bears are still abundant. Whatever Darwin may have believed in regard to the origin of dogs, he himself proceeded upon the idea that the fact, that wolves and jackals still exist in vast numbers, does not prove that dogs are not descended from them. He held that men, monkeys and all placental mammals have been derived from Marsupials, but of course he was well aware that pouched animals, as the opposum and the kangaroo, are still abundant. He was of the opinion that all breeds of the pigeon are descended from the rock-pigeon, yet the rock-pigeon is not extinct. He claimed that the peach is derived from the almond, yet almonds are abundant. He held that the nectarine is the offspring of the peach, yet the peach is not extinct.

Possibly some one will be ready to contend that natural selection has not had time to complete its work in true Darwinian style, and to say, "Wait a while—a short time geologically speaking—say some hundreds of thousands of years, and you will see the black bears all killed off, in the struggle for existence, by their offspring, the whales; o'possums, kangaroos and other marsupials by the placentals; rock-pigeons by fan-tails and tumblers; almonds by peaches; peaches by nectarines, and so on. Of the admissibility of this mode of explanation, we will speak farther on. At present we call attention to the fact that the Darwinian hypothesis of the derivation of new from old species supposes the survival of the latter. Darwin's declarations above quoted in regard to the improved descendants of a species exterminating the parent species, take for granted the continued existence of the old species after the new has been formed. As above stated, Darwin's view was that only *some* individuals or *some* varieties of the old species are transmuted, and that the old species still survives, though very liable or perhaps certain to perish in the struggle for existence. Thus, as above demonstrated, bears, wolves, jackals, catarhine monkeys, rock-pigeons, almonds, peaches and other species are considered as still existing after other species have been derived from them. Even if destined to become extinct through the competitive struggling for existence by derivative species, this fact supposes the survival of the old species, and the trans-

mutation only of *some* of its individuals or only of *some* of its varieties.

Some of the disciples of Darwin have adverted to the feature of their hypothesis, to which we are now directing attention, and have essayed replies to the objections founded upon it. Prof. Romanes endeavors to give answers to the following questions:

"If some species are supposed to have been improved by natural selection, why have not all species been similarly improved?

"Why should not all invertebrated animals have risen into vertebrated?

"Why should not all monkeys have become men?"

The learned Professor turns his attention more specially to answering the last question, Why did only *some*, not *all* monkeys, become men? And among other things, he says the wonder to him is that this improvement should have taken place even in one line of descent, and not that it should not have taken place also in others. [1] To some of us there are three wonders in the case. First, it is to us a very wondrous thing that monkeys should become men at all; second, it is a further wonder, that, if monkeys were to become men, the transmutation should have been restricted to the catarhines, or any other single species; third, it is also a wonder that, if the catarhines were to be improved and thus to become men, many of them were left out; so many indeed that this species of monkey is numerous at this present time perhaps as ever.

Le Conte, in trying to account for the fact (as he puts it) that spiders, dogs and monkeys (Le Conte seems to have disliked Darwin's hypothesis of man's Simian descent) could never become men, compares ascent in evolution to the way of everlasting life as revealed in the Scriptures, declaring it to be straight and narrow, and that "there be few that have found it—in fact, probably two or three only at every step." [2] This distinguished author seems to regard transmutation as rare and exceptional as saving faith among the Jews in the time of Christ.

Thus it is that Darwinians admit and set forth the fact that not only are most species permanent, but that also really no *species* is ever transmuted; natural selection operating only on some individuals or some varieties.

(1) *Darwin and after Darwin*, vol 2, p 342-6.
(2) *Evolution and its Relation to Religious Thought*, p. 15.

Taking into view all geologically recorded time, and the thousands and millions of species extinct and living, we may most assuredly say that, according to the representations and admissions of the Darwinians themselves, transmutation is indeed of rare and exceptional occurrence. Inasmuch as nature is uniform in her operations, accomplishing her ends by working according to general rules and not by means of exceptional cases, it is in the highest degree improbable and almost, if not altogether, incredible that, while the great majority of the various species of plants and animals are permanent in form and structure and become extinct without change and without descendants, the whole world should be continually stocked with new species, *by the transmutation of some individuals of a comparatively small number of old species.*

4. The improbability thus established that any old species are ever changed into new, is intensified by several plain facts and considerations.

(1.) *Within the period of human observation species have been universally permanent.* Men, horses, camels cows, sheep, goats, dogs, lions, tigers, bears, crocodiles, and other well known animals, have continued without change in form and structure for many thousands of years. Pigeons, dogs and other domestic animals, cultivated among the ancient Egyptians, were just as well developed thousands of years ago as are these species in our own times. The war-horse, as described in the book of Job, is as fine a specimen of the equine species as can be found at the present day. Darwin testifies that in Switzerland, during the Neolithic period, the domestic goat was commoner than the sheep; and that this very ancient race differed in no respect from that now common in Switzerland. [1]

Human efforts have combined with whatever there is in natural selection to effect changes in the form and structure of many of the lower animals. Fanciers, amateurs, sportsmen and all sorts of cultivators have joined their ingenuity and skill to natural variation and heredity to change as much as possible, cows, horses, dogs, pigeons, roses, lilies and other domestic species. But after thousands of years of persistent effort, the result is neither a new species nor an approach to a new species. Horses, dogs and pigeons, the species most assiduously cultivated, remain unchanged, possessing the same bones, nerves,

(1) *Animals and Plants under Domestication*, vol. 1, p. 105.

muscles, veins, joints limbs and organs with those of their own species in ancient times.

(2.) But it is scarcely worth while to speak of species remaining permanent for a few thousands of years, since *there are examples of ten times and a hundred times longer permanence.* The little animals that built the coral reefs of Florida began their work, according to Agassiz, about 200,000 years ago Dana estimates the age of some coral reefs at 384,000 years. [1] Yet the corals that lived and worked several hundred thousand years ago are declared to be identical in species with those of today. [2] If these microscopic beings have persisted so long, and are still persisting, we may expect to find larger and stronger animals remaining unchanged through periods of still more enormous length. The great antiquity ascribed to many existing species—the rhinoceros, bear, hyena, man himself, and many other animals, 200,000 years, 400.000, 800,000, implies permanence of species during these vast periods; permanence, too, amid all the hardships and horrors of the 160,000 years of the Glacial period. [3] The preservation of identity, for so long a period, and in such circumstances, seems to us the proof and promise of absolute permanence. Yet what are even these vast periods of persistence involved in the great antiquity of man and other living species, as maintained by many Darwinists, compared with some other admitted periods of permanence? Many of the invertebrate species of the Tertiary were identical *with those still living*; and, *living* species of Foraminifera *commenced in the Cretaceous.* These are the express declarations of Le Conte. [4] Now if we take geological chronology as reduced by Lord Kelvin, we have three millions of years for Cenozoic times. Those species then, which as mentioned above, have existed through the Tertiary on down to the present time, have maintained their specific identity during all that period—3,000,000 of years. But if, as Darwin and Spencer admitted, some species have persisted through all geologically recorded time, we have in them examples of persistence through about 50,000,000 of years.

(3.) It may be said that these examples of absolute permanence are few. But all the living things that are appropriately denominated *protozoa*, or primordials, must be re-

(1) *Manual of Geology*, p. 591 (2) Agassiz, *Classification*, pp. 53-4.
(3) Fiske, *Excursions*, pp. 30-51, 151. *Comic Philos.*, p. 295.
(4) *Geology*, pp. 503, 511.

garded as invariable. For if they changed into other species, the primordial species would cease to exist. If this second species should develop into another species, then both the primary and the secondary species would be annihiliated. It is thus shown that the protozoa, the primary species, must be permanent, unless their place, as often as it is made vacant by transmutation, is filled by special creation, or by spontaneous generation. For if the first species were changed into another, the place of this first species could not be filled except in one of the ways indicated. The first species being gone, if evolution takes place, it must be evolution *out of nothing* or evolution of living species out of non-living matter. In either case we virtually have *something out of nothing*, or at least an effect without an adequate cause. It were better to believe that the protozoa, the primordial species, have persisted through all the geological ages. But then again the next higher species, which we may call secondary, must be permanent also, for otherwise its place would have to be filled by special creation or by spontaneous generation. But if the second species were invariable, the third, for the same reason, must also be invariable. And so of all the rest. The ground may be taken that some *individuals* of the primitive protozoa varied, but that the *species* remained permanent. But, in that case, we still have permanence through all geologically recorded time, 50 millions of years as counted by Lord Kelvin, 300 millions as counted by Darwin,

(4.) The claim that natural selection is a very slow and gradual process, in view of the facts above stated, is evidence against the mutability of species. It is indeed claimed that all these facts are shown to be consistent with Darwinism, by this consideration, that natural selection takes long periods of time to do its work and that therefore temporary stability is to be expected. Darwin says: "If we look to long enough intervals of time, geology plainly declares that all species have changed; and they have changed in the manner which my theory requires, for they have changed slowly and in a graduated manner." [1] But Darwin, as we have showed, previously declared that some species and groups of species have persisted without change from the first dawn of life on down to the present time. We have showed, too, that Spencer makes the same dec-

(1) *Origin of Species*, p. 403.

laration, and that Le Conte admits that most species are permanent, and that but few change.

But now again comes Darwin and affirms that if we will but "look to long enough intervals of time geology plainly declares that *all* species have changed." [1] Well, both he and Spencer had looked (to use Spencer's expression), "through all geologically recorded time," and had found some species persisting unchanged through all that time. It seems then, if *all* species have changed, that some of them must have changed before the first dawn of life and before the beginning of geologically recorded time. But this involves self-contradiction and an impossibility, especially in view of the fact that it is geology, which Darwin says, plainly declares that *all* species have changed. But it is thus shown that geological time, vast as it is, is not sufficient to meet the requirements of natural selection. Darwin speaks of this process going on for many thousand —yea, a million, even a hundred million of generations. [2] He counted 300,000·000 of years as having probably elapsed since the latter part of the secondary period. [3] He, like many other geologists, supposed the whole period, since life began on earth, to be thousands of millions of years. But, since Darwin's time, the number of supposed years has been greatly reduced, The maximum estimate of Lord Kelvin is one hundred million of years. The Darwinists have no longer unlimited time for the working out of natural selection. And accordingly the later Darwinists have been compelled to abandon Darwin's maxim, *Natura not facit saltum*, and to maintain that natural selection is not always slow and gradual. Le Conte speaks of many changes from one species to another, or the introduction of new species, as rapid and paroxysmal. [4] Dana declares "the transitions with rare exceptions abrupt." [5] Even Fiske speaks of "immensely long periods of stability, alternating with relatively brief periods" of evolutionary change. Though this ardent Darwinist does not exactly say that nature jumps, he represents her, though for the most part as standing, yet occasionally as running quite fast. This representation partially coincides with Darwin's view of only a few species undergoing change at one time, all the rest of the millions of species remaining stationary. Our

(1) *Origin of Species*, pp 275, 423
(2) *Origin of Species* pp. 111-115. (3) p. 282
(4) *Geology*, pp. 313, 334, 344 (5) *Manual of Geology* pp. 600, 602, 603.

suggestion is that in view of these facts the logical conclusion must be that most of the species do not change at all. We think that, in connection with other facts, the proved and admitted stability of species for so long periods of time establishes the doctrine of invariability for all time. We hold indeed that this doctrine is established by the stability of species during the period of human observation and history. We are of course willing to grant a much longer period for the transmutation of one species into another, or the production of a new species from old organisms; but we insist that five thousand years are long enough time for the *beginning* of the change, and also for the visible manifestation of it. But there is no such manifestation, no evidence that the process of tranmutation has begun.

There are variations to be sure; *varieties* have sprung up, but varieties or breeds are not species. To call varieties "incipient species" is to take for granted the very thing in dispute. Besides, many living species have existed more than 5000 years, some of them (according to the geologists) ten times or one hundred times that period. But here they are before our eyes without any indications of change, without the slightest approach to transmutation. Surely 5,000, 10,000, or 50,000 years are long enough to produce some evidence of change. It takes about twenty-one years for a child to become a man. We do not expect a child to grow into a man in five years. But if the child does not grow any at all in five years, it will never become a man. We do not insist that horses, cows, elephants, kangaroos, pigeons, chickens, sharks and porpoises shall change into other species in 5,000, 10,000 or even 50,000 years; but we do insist that since, during these periods, they have made no progress toward transmutation, they never will be changed into other species. Transmutation is confessedly a long road to travel. If species or individuals make no progress in 5,000 or 50,000 years, they never can finish the journey.

We infer that the transmutation of species, if it were actually taking place, would manifest itself within the historical period, just as changes in the inorganic world have manifested themselves within that period. It is true that it is claimed that changes take place in the inorganic world only imperceptibly, and this supposed fact has been employed to nullify the above argument against Darwinism.

Prof. Jevons remarks that it might as well be argued that no geological changes are taking place, because no new mountain has risen in Great Britain within the memory of man. [1] This is not fair. We do not argue that transmutation does not take place, on the ground that it has not taken place within the historical period, but on the ground that within that period, and in the species that have existed much longer than that period, there are no indications of the slightest approach toward transmutation. But in the inorganic world there are visible indications of progressive change. It is surprising that Prof. Jevons, and those who adopt his logic, assume the contrary. As a matter of fact, geological changes have manifested themselves within the memory of man, to human eyes, and are manifesting themselves at the present time.

Reclus makes such statements as the following: The group of the Sandwich Islands is rising; a gradual subsidence may be noticed in the archipelagoes of the South Seas; since the first European navigators visited these seas, several islands have disappeared, and others, such as White Sunday Island, have considerably diminished in size; New Zealand is rising in certain places so considerably that English colonists, who arrived there a few years ago, have been able to notice that the headlands increase in height, and that banks of rocks are gradually obstructing the entrance of the ports; in ten years, the shores at Lyttleton have risen three feet; the New Hebrides, the Solomon Islands, the northern and western coasts of New Guinea, the numerous islands which compose the Sunda Archipelago, after having quite recently subsided, are all now rising; a portion of Australia is known to be experiencing a continuous movement of elevation at the estimated rate of four inches a year. [2]

The following statements are made on the authority of Dr. John C. Draper: The Andes are gradually sinking; Quito, as shown by actual measurements made at five different times, from 1745 to 1870, has sunk 246 feet in 125 years; Pichincha, 218 feet in the same time and 425 feet in the last 26 years; and Antisana 165 feet in 64 years. [3]

Dana, the geologist, testifies as follows: "In 1822, the coast of Western South America for 1,200 miles along by Concepcion and Valparaiso, was shaken by an earthquake,

(1) *The Principles of Science* pp. 437-8.
(2) Reclus, *The Earth*, pp. 562-5.
(3) *Year Book of Nature and Popular Science for* 1878, pp. 126-7.

and it has been estimated that the coast near Valparaiso was raised at the time 3 or 4 feet. In 1835, during another earthquake in the same region, there was an elevation, it is stated, of 4 or 5 feet at Talcahuano which was reduced after a while to 2 or 3 feet. In 1819, there was an earthquake about the Delta of the Indus, and simultaneously an area of 2,000 square miles, in which the fort and village of Sindree were situated, sunk so as to become an inland sea, with the tops of the houses just out of the water." [1]—"Along the coasts of Sweden and Finland, on the Baltic, there is evidence that a gradual rising of the land is in slow progress. Marks placed along the rocks, by the Swedish goverment many years since, show that the change is slight at Stockholm, but increases northward, and is felt even at the North Cape, 1000 miles from Stockholm. At Uddevalla the rate of elevation is equivalent to 3 or 4 feet in a century.

"In Greenland for 600 miles from Disco Bay, near 69° N. to the frith of Igaliko, 60° 43′ N., a slow sinking has been going on for at least four centuries. Islands along the coast and old buildings have been submerged.

"It is believed also that a sinking is in progress along the coast of New Jersey, Long Island, and Martha's Vineyard, and a rising in different parts of the coast-region between Labrador and the Bay of Fundy.

"The above cases illustrate movements by the century, or those oscillations which have taken place through the geological ages, raising and sinking the continents, or at least changing the waterline along the land." [2]

It is thus shown that the rising and sinking of mountains, islands, coasts and continents are matters of observation and measurement. Many additional facts might be given ; but we deem the above presentation sufficient to remind the reader that changes in the inorganic world, especially geological changes, are visible to human eyes, and that their progress in many cases are noted and measured. And what we claim is, that if the transmutation of species were actually taking place, the process and its progress would be observable, especially in the case of those living species which, as claimed, began to exist ten, twenty or fifty thousand years ago. But even these, some of which passed through the Glacial period (which began 240,000

(1) *Text-Book of Geology*, p. 361.
(2) Dana's "*Text-Book of Geology*, p. 362.

years ago and continued 160,000) show not a single trace of transmutation.

The annual elevation and subsidence of islands and continents, mountains and plains are measured by feet and inches, and are duly announced and recorded ; but there is no perceptible approach to transmutation of species in 5,000, 10,000, 100,000 years, and for much longer periods of time.

In regard, then, to the immutability of species, the following points have been established, by the testimony mainly of Darwinists:

1. It is admitted by Darwinists that some species have remained unchanged from the dawn of life to the present time—through all geologically recorded time—during millions and millions of years.

2. It is admitted by Darwinists that at any one time, and at all times, only a few species are undergoing the process of transmutation.

3. It is admitted by Darwinists that at one time, and at all times, nearly all the species, millions in number, are stationary and make no progress whatever toward transmutation.

4. It is admitted by Darwinists that no *species* is ever changed into another, transmutation being restricted to some individuals or to some varieties.

5. It is admitted by Darwinists that when some individuals of a species are transmuted into another species, the former species continues to exist, though liable, like species in general, to become extinct.

6. It is admitted by Darwinists that all species, but a few, remain unchanged during the whole period of their existence, and finally become extinct without leaving any descendants.

7. It is admitted by Darwinists that, during the whole period of human observation and history, all the efforts of cultivators and fanciers, added to the effects of heredity, variation and environment, have not produced a single new species nor even a perceptible approach to transmutation.

8. It is admitted by Darwinists that, among all the species that have survived from remotely ancient times, some of which are believed to have existed during tens of thousands, hundreds of thousands, or even millions of years, not one, either in any of its individuals, or in any of

its varieties, give any indications of progress toward transmutation.

In closing this chapter we remind our readers that our argumentation is based on facts stated or admitted by the most distinguished Darwinists. It was Darwin himself who declared that *only a few species are undergoing a change at any one period, and that transmutation requires immense periods of time.* It was Darwin who said that *only a few species change; that all but a few species die out without change and without descendants, and become utterly extinct.* [1] It was Huxley, the champion of Darwinism, who declared, in 1862, *that the ascertained facts of palæontology negative the doctrine of progressive modification, and* who declared, in 1882, that *only among the higher vertebra* (not among the vast majority of animals) *does there seem to be a balance of evidence in favor of evolution.* [2] It is Spencer who declares that even this *small appearance of evidence is probably illusive, and that the evidence usually supposed to prove progress is untrustworthy.* He declares further that *the gradation in fossilized types may prove nothing more than successive migrations.* [3] It is Le Conte, an evolutionist, who declares that *only the more plastic forms change into other species, and that nearly all species are rigid and permanent.* [4]

If these gentlemen had tried they could scarcely have more effectively knocked the props from under the hypothesis of the variability of species. It was, in view of such facts as these, that, at the beginning of this chapter, we did what some will consider a very presumptuous thing ; that is, proposed to prove that *species have been and are unchangeable.* We trust that those who read the chapter will acquit us of presumption.

(1) *Origin of Species*, pp. 401, 423.
(2) Crit. and Adds, pp. 184, 186, 187.
(3) *Biology*, vol. 1, p. 323.
(4) *Evolution &c.*, p. 266-7.

CHAPTER IV.

THE FERTILITY OF CROSSED VARIETIES AND INFERTILITY OF CROSSED SPECIES.

The argument is as follows: All the *varieties* that have sprung up naturally among plants and animals, and all the *varieties* that have been produced by the most careful, selective breeding, are fertile when crossed; and their progeny are fertile with one another. But crossed *species* are infertile; or, if fertile, their offspring are infertile. We have thus a test of species, since what are called varieties are fertile with one another and their progeny are fertile with one another, and as this is not true of crossed *species*, it is evident that the most careful and persistent selective breeding, co-operating with natural selection, has not produced a single genuine species. Men have cultivated pigeons, dogs, horses and other animals for thousands of years and joined their efforts to the powers of nature to secure as great changes as possible. But the resultant breeds of pigeons are fertile when crossed, and their progeny are fertile also. This is true of the various breeds of dogs, horses and other animals. Hence, the result has been, not the production of a single species, but only of breeds or varieties. Much less could natural selection, unaided by human effort and selective breeding, produce pure species. In view of such facts, Huxley declared: "Our acceptance of the Darwinian hypothesis must be provisional so long as one link in the chain of evidence is wanting; and so long as all the animals and plants certainly produced by selective breeding from a common stock are fertile, and their progeny are fertile with one another, that link will be wanting." [1]

From the discussion of this subject by Darwin and other writers we glean the following facts and principles:

(1) *Man's Place in Nature*, p. 127.

1. The sterility of species, when inter-crossed, or of their offspring, is necessary to prevent the mixing of species and the confounding of organic forms. If species were capable of crossing freely, the result would be the union of all species in the same country. In other words, all the species in the same country, horses, cows, sheep, dogs and swine, would be merged in one species, and what a species! [1]

2. The amalgamation of species is prevented in some cases by the sterility of the species themselves when crossed. In other cases, the species are fertile with one another, but their hybrid offspring is sterile. Thus the horse and the ass breed together, but their offspring, the mule, is sterile. Darwin remarks that to grant to species the power of producing hybrids, and then to stop further propagation by different degrees of sterility, "seems to be a strange arrangement." [2] But there are many strange facts in this world of ours.

3. The means by which sterility is produced are different. In some cases the sterility results from the death of the embryo; in others, the embryo is not developed, for which no reason can be assigned. In some cases the reproductive organs of hybrids are defective; but in some hybrids they are perfect in structure, and are only functionally impotent. Thus while the sterility of hybrids is a clearly demonstrated fact and its necessity for the pre vention of the amalgamation of species is easily recognized, the causes of it, or the means by which it is produced, are not understood. If sterility results from the death of the embryo, it is not known why the embryo dies. If it results from the non-development of the embryo, the cause of the non-development is unknown. If the reproductive organs of hybrids are defective, it cannot be ascertained why they are defective. If they are perfect in structure, but impotent functionally, the cause of the impotency is unknown. In many cases no cause whatever can be assigned for the sterility of hybrids. But it is none the less a *fact*; and its *final* cause, that is, its design or purpose, is readily recognized by all except those who say, "*There is no God*"; namely, the preservation of distinct species. Even Darwin admits that "species within the same country could hardly have kept distinct had they been capable of crossing freely." [2]

(1) *Origin of Species*, p. 217.
(2) *Origin of Species*, p. 230.

4. This law of sterility is a *general one*; perhaps we would be justified in stating it to be *universal*. We may at least say that this law, if not absolutely universal, is at least a very general one. Darwin admitted "the high generality of some degree of sterility" as the result of the intercrossing of species. He further declared that sterility "is an extremely general result, but that it cannot, under our present state of knowledge, be considered as absolutely universal." [1] Both Kölreuter and Gärtner, whom Darwin declared to be conscientious and admirable observers, make the law universal. Darwin himself admits that there are no known exceptions to the law of sterility so far as intercrossing and hybrids among *animals* are concerned. "I doubt whether any case of a perfectly fertile hybrid animal can be considered as thoroughly well authenticated." [2] And again: "I do not know of any thoroughly well-authenticated cases of perfectly fertile hybrid animals." [3] He claimed, however, such cases as existent among hybrid *plants*. But in many of these the decision of the question depends on the distinction between species and varieties.

5. In regard to intercrossed varieties, the law of fertility prevails. There may be exceptional cases of sterility, but fertility is general, if not quite absolutely universal.

It is conceded then, that in the case of intercrossed varieties, the general law is fertility; and that in the case of intercrossed species the general law is sterility.

But the inter-crossed varieties that have resulted from selective breeding and the operation of the law of natural selection are fertile and their descendants also are fertile. Therefore in all these thousands of years in which human effort and skill have united with the natural laws of variation and heredity to produce changes in vital organisms, not a single new species has been brought into existence.

When off the subject of natural selection, Darwin laid down the principle that even a slight degree of sterility of allied forms when crossed is accepted as proof that such forms belong to different species. "Even a slight degree of sterility between any two forms when first crossed, or in their offspring, is generally considered as a decisive test of their specific distinctness." [4] Le Conte too speaks of

(1) *Origin of Species*, pp. 218, 225.
(2) *Origin of Species*, p. 223. (3) p. 224.
(4) *Descent of Man*, p. 166.

"cross sterility as the constant character of species." [1] Thus, then, it is shown that the result of all the efforts of man in the way of selective breeding, added to the operations of natural selection during thousands of years, has been the production only of breeds or varieties, and not of a single genuine species.

In concluding this subject we remark as follows :

1. God and nature do many a thing in several ways. Variety as well as uniformity, "variety in uniformity," characterizes the work of God. Accordingly the confounding and wiping out of species are prevented in different ways : (1), by the mechanical impossibility of sexual union between different species ; (2), by antipathy or disinclination ; (3), by the sterility of the inter-crossing species ; (4), by the sterility of the resultant hybrids; (5), by the decreasing fertility and dwindling away of their posterity.

God's resources are infinite. He does many a thing in many ways.

2. The inter-crossing of the species, such as Darwin and his disciples speak of as rare and difficult, in fact never takes place in the course of nature, but is brought about by human effort, and only by careful and persistent human effort. Nor have such efforts after all produced a new species. The very species with which man has had the most and the longest to do—camels, horses, asses, cows, sheep, goats, dogs, cats and swine, still retain their identity as species. If any unnatural union, such as that of the horse and the ass, ever takes place in the state of nature, it has not been allowed to result in the amalgamation of species, or the production of a new species. Thus in the historical period, and during the geological ages, the barriers erected by God and nature have proved sufficient to keep the various species apart and distinct. Geology does not bring to light a single instance of the merging of two species into one. To be sure, only in the later age was man present with his attempts at artificial inter-crossing. But judging by the actual results in the historical age, we have no reason to believe that amalgamation would have taken place even if there had been away back in the Miocene age fanciers and experimenting scientists doing their level best to get up matrimonial alliances of camels with cows, beetles with butterflies, and snap-dragons with touch-me-nots.

3. At most, the efforts of the scientific experimenters

(1) *Evolution and its Relation to Religious Thoughts*, p. 78.

have produced only a few curious results among the lowest species of plants; and even there, when the artifical appliances are withdrawn, everything produces "after its kind." No two species are combined, and no new species is produced.

4. The question is not what a fancier or a scientific investigator may occasionally accomplish by the artificial conjunction of two organisms of different species and of opposite sexes, or by the mixing of the pollen of flowers of different species; but the question is, can he start a new species? Facts prove that where there is no tinkering of man with nature, species are not amalgamated; and that even where there is a tinkering with nature, resulting in the production of some half-and-half, anomalous creature, that creature and its posterity (if it has any) soon disappear, and the old species remain as before. Every such experiment is like throwing a pebble into the ocean. The pebble sinks and is seen no more; a bubble rises and the ever flowing tide rushes on.

CHAPTER V.

THE PALÆONTOLOGICAL ARGUMENT—BREAKS, CHASMS, ABRUPT TRANSITIONS, ABSENCE OF TRANSITIONAL FORMS.

According to genuine Darwinism, there have been no sudden changes in evolution, and could be none. Darwin held that all changes are slowly effected [1], and that there has been and is no sudden introduction of species. He admitted indeed that whole groups of allied species appear to have come in suddenly, bnt he declared the appearance to be *false*. [2] According then to the Darwinian hypothesis, there must have been an interminable number of intermediate forms, linking together all the species in each group by gradations as fine as our present varieties. This was expressly admitted by Darwin. He also maintained, in accordance with the principle that nature never jumps (Natura non facit saltum), that there is not, and never has been, any great difference between a species and the ones immediately preceding and succeeding it.

But the facts are just the opposite of what the Darwinian hypothesis demands. There are great differences between species related as predecessor and successor; numerous breaks and chasms in the series; abrupt transitions from lower to higher species. The intermediate forms are wanting. The geological record, at various points, indicates an entire absence of connecting links between preceding and in-coming species. It reveals gaps and chasms in the series of successive species of plants and animals. Not only is there evidence of the absence of transitional forms in the past, but the absence of such forms now is an undeniable fact. According to Darwinism, there ought now to be many imperfectly formed spec-

(1) *Origin of Species*, p. 401.
(2) *Origin of Species*, p. 402.

ies. If Darwinism be true, there was, at one time, a race of animals half reptile and half bird, and a vast number of other animals at various stages of metamorphosis between reptiles and birds; and, if natural selection has not ceased to operate, there ought to be many such animals now.

If all land animals are descended from water animals, when the fishes began to come out on land, before they entirely abandoned the water, they must have had very short and small legs. At first they had only nascent legs, which developed from generation to generation. There ought, however, to be fossils of fishes thus imperfectly metamorphosed into land animals, and there ought also to be fishes at the present time growing legs preparatory to coming out on dry land, if natural selection has not shut up shop and quit business entirely.

According to Darwinism, there must have been at one time a race of animals half bear and half whale, and besides a multitude of animals at various stages of transformation between the bear and whale. Also there ought to be at the present time some bears partially changed into whales. It was the report of Mr. Hearne's having seen black bears in North America swimming in the water to catch insects that furnished Darwin with the illustration showing how bears were transformed into whales. As black bears have adhered to the practice of swimming in the water to catch insects on down to the present time, some of them ought to be somewhat advanced toward whale-hood. Some of them by this time ought at least to be web-footed and to have flattened and forked tails.

What is true of bears is true of other species. If horses, cows, camels, sheep, goats, swine, lions, tigers, hyenas, gorillas and other living species, have existed 100,000, 50,000, or even 10,000 years, there ought to be among them individuals partially metamorphosed into other species. In short, if Darwinism be true, there ought to be everywhere examples of partial transformation; aquatic animals partially turned into land animals; reptiles partially turned into birds; quadrupeds partially turned into bipeds; and, as examples of evolution going backward, birds partially turned into snakes, and land animals partially turned into aquatic animals.

There are no such imperfectly formed animals in existence, or if they exist they have not been discovered. The notion that they exist, but have escaped the knowledge

of scientists, is absurd. Nor are the fossil remains of such animals found in the strata of the earth, a fact that indicates the absence of intermediate forms in all past time.

Besides all this, there are numerous breaks or chasms in the series of successive species. Time and again species have abruptly disappeared. Time and again have species appeared suddenly, and always full formed. These facts are indisputable and are admitted on all hands. Darwin says, "Breaks often occur in all parts of the series, some being wide, sharp and defined, others less so in various degrees." [1] Dana declares, as follows: "The transitions between species, genera, tribes, etc., in geological history, are, with rare exceptions, abrupt." [2] Spencer speaks of "breaks," "great blanks," "wide gaps," "great gaps." in the series of fossils. [3] Le Conte speaks of "gaps," "breaks," even of "paroxysms of more rapid movement in evolution." [4]

It may be proper to consider some of the breaks which palæontology brings to view.

1. One of the breaks, *chasm* we may call it, is *between living organic matter and non-living matter.* Life proceeds from life. The scientists in general testify that spontaneous generation does not as a matter of fact take place. Agassiz, Huxley, Tyndall, Beale, Lord Kelvin, Virchow, Dana, Gray, and many more of the most distinguished scientists of the age, as is well known, have declared that the evidence derived from observation and experiment proves that, as a matter of fact, life always proceeds from antecedent life. But at one time there was no life on earth or in it, as is demonstrated by the fact of the prevalence of intense heat. The existence of the igneous, azoic rocks is proof of the prevalence of intense heat and of the absence of vegetable and animal life. It is indeed possible that there were vegetables and animals on earth before the azoic rocks were formed, and that all fossils were destroyed out of these rocks by the prevalent heat. But if so, all living species must also have been destroyed. For when the earth was a molten mass, a red-hot ball, life upon it and in it was impossible. There was then a time when there was no life on earth. But life exists on earth now. Therefore life on earth *began.* But *how* did it begin? And *why* did

(1) *Descent of Man*, p. 156.
(2) *Manual of Geology*, p. 600.
(3) *Illustrations of Universal Progress*, pp. 355-61.
(4) *Geology*, p. 344.

it begin? Evolution does not account for the beginning of life. For life not being in non-living matter could not evolve or be evolved from it. Involution must precede evolution. The problem is how dead matter, after the earth cooled, became living matter. *How* and *whence* did life enter some non-living form, or forms, and thus make evolution possible?

It is a suggestive fact that Lord Kelvin (Sir W. Thompson) at one time proposed and advocated the hypothesis that life was brought to our globe by a meteoric stone. But how did the meteoric stone come to possess life? If the meteoric stone and the living organism which it brought to the earth, came from a distant planet, the question arises how did life come to that distant planet? The beginning of life on a distant planet is a problem as unsolvable by science as is the beginning of life on earth.

Quite a number of scientists have attempted to bridge the chasm between living matter and non-living matter by means of spontaneous generation. Hæckel suggested that life began with what he calls Protococcus, a species of Algæ (sea-weed) so minute that several hundred thousands of them occupy a space no larger than a pin's head. These he claimed to be the most ancient of all vegetable Monera, and he affirmed that they arose by spontaneous generation in the beginning of the Laurentian period. [1]

Huxley, though he admitted that Biogenesis (the theory that life proceeds only from antecedent life) is victorious along the whole line of investigation, still clung to the notion "of the evolution of living protoplasm from not living matter" some time in the remote past; and he indulged in the "expectation" that Abiogenesis (spontaneous generation) would be established as a scientific fact. [2]

Spencer objects to the doctrine of spontaneous generation, but he objects to the *name* rather than to the *thing*. He is willing to grant that "the evolution of life in its lowest forms may go on under existing cosmical conditions." But he believes "it more likely that the formation of such matter and such forms took place at a time when the heat of the earth's surface was falling through those ranges of temperature at which the higher organic compounds are unstable." He conceived that the moulding of such organic types commenced with portions of protoplasm more

(1) *History of Creation*, Vol. 2, pp. 80-85
(2) *Lay Sermons*, p. 366-7.

minute and indefinite than the lowest Rhizopods.[1] Thus Spencer really affirms the dogma of spontaneous generation, the production of life from non-living matter, or the origination of life by material and natural forces.

Le Conte condemns Dr. Bastain and Prof. Hæckel, together with the anti-evolutionists, for maintaining that spontaneous generation and evolution must stand or fall together. He even says that the conditions necessary to spontaneous generation are *now*, not only unreproducible, but unimaginable; and that if life were now extinguished from the earth, it could not be rekindled by any natural process known to us. He, however, supposes, and evidently feels that he is under the necessity of supposing, that abiogenesis or spontaneous generation did *once* occur, and only *once*, and that it will never occur again.[2] The dogma of spontaneous generation, as propounded by Le Conte and some other evolutionists, reminds us of a little boy that pleads to be allowed to do something naughty, and asks to be allowed to do it just once, only once, and promises never, never to do it again.

Fiske thinks the advocates of spontaneous generation have not made out their case, but notwithstanding indicates his own acceptance of it. His hypothesis is that life originated from the cooling of the earth and in the juxtaposition of carbonic acid, ammonia, nitrogen, hydrogen and oxygen. He speaks of "the association of vital properties with the enormously-complex chemical compound called protoplasm as an unsolved mystery" but at the same time speaks quite confidently of "the mode in which protoplasm must have arisen."[3]

Such is a specimen of the views propounded by leading Darwinians concerning the break between living and non-living matter. They almost unanimously attempt to bridge the chasm with some form or other of the unscientific dogma of spontaneous generation—a dogma which is based on the idea that the dead can produce the living and that an effect can exist without an adequate cause. The plea that life was evolved only once, and a very long time ago, and at a time when the powers of nature were much greater than now, merely indicates that those who offer it are not fully satisfied with their own views and are ready

(1) *Biology*, Vol. 1 pp. 480-1.
(2) *Evolution and its Relation to Religious Thought*, pp. 15-16
(3) *Cosmic Philos.* Vol. 1. pp. 430-434.

to shrink from them. If the production of life from non-living matter without the intervention of God's creative power, is *not* an effect without an adequate cause, then may such effects take place ten thousand times, ten million times, or an indefinite number of times. But if the production of life from non-living matter, without the intervention of God's creative power, is an effect without an adequate cause, then may such effects take place an indefinite number of times. Nor does it help the matter to say that the powers of nature have been weakened, and that the maxims, *omne vivum ex vivo*, and, *ex nihilo nihil fit*, are applicable indeed to our degenerate and decrepit times, but not to the time when nature was young and vigorous. For if so, what becomes of the doctrine of the conservation of forces? Whither has gone the lost power of nature?

Darwinism, as taught by Darwin, at least as first taught by him, steers entirely clear of these breakers. In his first and greatest work, he speaks of "the progenitors of innumerable extinct and living descendants" as being *created*. He makes even the tautological declaration that "this first *creature* was *created*." [1] He speaks of "one primordial form into which life was first breathed." [2] He speaks of "the laws impressed on matter by the Creator." [3] He argues for a *single* center, and against *multiple* centers, of *creation*. [4] These words and phrases ramove all difficulty in regard to the initial process of evolution. For granted that there is a Creator, and a first creature, and the laws of the Creator, and a primordial form with life breathed into it, certainly evolution could have a fair start. But Darwin, though he did not *formally* repudiate these views and declarations, seems not to have adhered to them; and many of his followers are not willing to grant anything for evolution to begin to work on but lifeless matter. They leave the chasm between non-living and living matter without a bridge.

2. A second break, a chasm indeed, is found between man and the brutes.

On this point we need do little more than quote the admission of Darwin, as follows: "The great break in the organic chain between man and his nearest allies, which cannot be bridged over by any extinct or living species, has often been advanced as a grave objection to the belief

(1) *Origin of Species*, p. 422.
(2) p. 419. (3) p. 423. (4) pp. 307, 310.

that man is descended from some lower animal." [1]

Let it be observed that it is admitted in the above quoted declaration that the *break is great* and that it *cannot be bridged over*. We further remark as follows:

(1.) The reply of Darwin, unlike his writings in general, is weak. He first says that this objection will not appear of much weight to those who, from general reasons, believe in the general principle of evolution. [2] This statement we admit to be correct. Of course the objection will not appear to be of much weight to any one who has already made up his mind to disregard it. Darwin's second reply is, that breaks are quite common—"Breaks often occur in all parts of the series." This fact only strengthens the objection. And the truth is that it took Darwin some time to throw off the influence of this very objection. For some time it was in his estimation one of the *grave* objections, the thought of which made him *stagger*, as he himself says. [3]

(2.) We need to be on our guard against the pernicious, we might almost say, demoralizing, influence from the classification made of man by the natural scientists. In classifying him, they recognize him only as a corporeal being, ignoring him almost entirely as an intellectual, moral and religious being. As a Vertebrate, he is classed with fishes, snakes, birds and beasts. As a Mammal, he is classed with rats, dogs, mice, monkeys, elephants, whales and kangaroos. As a Placental, he is classed with horses, cows, asses and hogs. But as to man's intellectual, moral, spiritual and immortal nature, by which he is likened to God and the angels, natural science is for the most part dumb. It has neither eye, nor ear, nor voice, nor tongue, nor thought, for man's greatest and noblest qualities. So it classes him with the brutes, even with the lowest of them.

(3.) Yet the gulf between man and the lower animals has not been entirely unnoticed by the professors of natural science. Even Huxley in a foot-note (in a *foot-note*, mark ye) incidentally speaks of "the immeasurable and practically infinite divergence of the Human from the Simian stirps." [4] The difference between man, in the totality of his being, and an ape has been declared greater than the difference between an ape and a mushroom. [5] The state-

(1) *Descent of Man*, p. 156.
(2) *Origin of Species*, p. 181. (3) p. 154.
(4) *Man's Place in Nature*, p. 122. (5) *Mivart*.

ment is true, if we compare the smartest and best trained ape, not with the lowest and most degraded of mankind, but with the civilized man. The gap exists between the ape and the mushroom and between the man and the ape. But there are no intermediate species to fill the latter gap, no bridge spanning the chasm. The missing link in the form of a speechless, ape-like man, or in the fossil remains of such a creature, has not been found.

3. A *third* break is found in *the earliest geological age.*

In proof, we present the testimony of Agassiz, who though not a Darwinist, is surely a competent witness as to matters of fact. He says, "Every class among Radiates, Mollusks and Articulates are known to have been represented in those earliest days, with the exception of the Acalephs and Insects only." And again, "Fishes exist wherever Radiates, Mollusks and Articulata are found together." Once more, "It is proved beyond doubt that Radiata, Mollusca, and Articulata are everywhere found together in the oldest geological formations, and that very early Vertebrata are associated with them, to continue together through all geological ages to the present time." [1]

Such is Agassiz's testimony. Since his time, both Acalephs and Insects, have been found in the Silurian. But we call attention especially to the fact, as stated by Agassiz, that not only Articulata, but Vertebrata, animals of the highest branch of the animal kingdom, existed in the earliest geological age, their remains being found in the lowest fossiliferous strata. This fact is copiously admitted by Prof. Romanes. In speaking of things which, as an evolutionist, he would not have expected, he says, that "animals of the highest sub-kingdom are proved to have abounded in the very lowest strata where there is good evidence of there having been any forms of life at all." Again, after stating a number of facts, he says, "These facts render it practically certain that some members of this very highest class of the highest sub-kingdom must have existed far back in the Primaries." [2] These facts, proved and admitted, are very significant. Here we find Vertebrata away down in strata, where only Radiata—Protozoa—Rhizopods, according to evolution, ought to be found—members of the highest branch of the animal kingdom in the very lowest strata where life is proved to

(1) *Essay on Classification*, p. 24.
(2) *Darwin and after Darwin*, Vol. 1, pp. 432-3.

have existed at all. Thus at the very beginning of the Palæozoic age there is proved to have been a leap from the lowest to the highest forms of animal existence.

4. Another break is found in the Devonian age.

Radiates, Mollusks, Articulates and Vertebrates all existed together. But among the last mentioned, there was a sudden advance in form and structure. The waters swarmed with fishes, and never since have fishes been more abundant, larger, or better armed. Some of these Devonian fishes were from 15 to 30 feet long, with heads six feet across, and eyeballs three inches in diameter. [1]

How is this sudden advance in Vertebrate life accounted for by thorough-going evolutionists? Many of them fall back on the hypothesis of the imperfection of the geological record, as suggested by Darwin. They suppose that all the gaps and breaks were filled with intermediate species, but that, for some unknown cause, the strata contain no remains of such intermediate species. In the case of the Devonian Vertebrates, Prof. Le Conte frankly admits that there was no break by geological unconformity and therefore no notable loss of record. He therefore admits that the gap in this case can be accounted for only by supposing "*paroxysms of more rapid movement* in evolution."[2] This idea of *paroxysms of rapid evolution* is contrary to Darwinism as taught by Darwin. But Le Conte is constrained to adopt this hypothesis in order to avoid the conclusion that the Devonian fishes came in without progenitors.

5. Another of the frequent breaks occurred in the Tertiary age.

Without calling attention to particular facts, we will refer to some authorities in support of the above proposition. Dana declares the break in the early Tertiary to be "truly great, even astounding." [3] Le Conte admits the appearances of sudden and great changes in the fauna of this age, and says that the fact must be accounted for, if at all, not by a gap in the geological record, but by the hypothesis of "*times of rapid evolution*." [4]

6. The Quaternary is recognized as revolutionary and as characterized by gaps and breaks. These are accounted

(1) Le Conte, *Geology*, p. 334-343. Dana, *Text Book of Geology* pp 237-240.
(2) *Geology*, p. 344.
(3) *Manual of Geology*, p. 602.
(4) *Geology*, p. 522.

for usually by geological unconformity and lost records.

Now all these gaps and breaks, and others which we have not expressly mentioned, are admitted by evolutionists, in this sense that the geological record does seem to indicate their reality. Most evolutionists, however, maintain that it *only seems* to do so, and that the gaps and breaks exist only in the geological record. Darwin, as we have mentioned, said that species often appear to come in suddenly, but that they *falsely* appear to do so. He charged this false appearance upon the imperfection of the geological record, and in this he has been followed by nearly all the Darwinians.

We remark as follows:

1. This hypothesis of the imperfection of the geological record was devised and brought forward in order to defend the Darwinian hypothesis of the slow formation of species by natural selection. Doubtless the main argument for the imperfection of the geological record is the fact, that this hypothesis cannot be maintained without it. Thus it is a mere assumption to meet a difficulty. To the evolutionist it seems logical and justifiable, because it is essential to the maintainance of an opinion which he has antecedently accepted. He is ready to follow Darwin in believing the geological record to be imperfect, as Darwin himself said, "to the degree I require."

2. At many of the breaks in the organic series *there is no evidence at all* of the imperfection of the geological record.

At the appearance of the Devonian fish; at the appearance of monkeys in the Miocene; at the appearance of the huge monsters of the Quaternary; at the appearance of man; at the sudden disappearance of species at various times without descendants—at none of these gaps and breaks is there a scintilla of evidence that intervening strata have been removed, or that their fossils have been destroyed. But the hypothesis of the slow formation of species by natural selection requires that these breaks and chasms shall be filled, and the claimed imperfection of the geological record gives the evolutionist an opportunity to fill them by *imagination*.

3. An insuperable objection to this hypothesis of the imperfection of the geological record lies in the fact, that if the claimed imperfection exists, it is a very one-sided affair. The transitional forms, the partially developed

species have all perished and their fossils, if any existed, have been destroyed, and fossils only of completely formed species have been preserved. Why this discrimination? Is nature so hostile to intermediate forms and partially formed species that she hunts out and destroys their fossils? It used to be said that nature abhors a vaccuum; and when it was found that water would rise to the height of 32 feet in an exhausted air-tight tube, it was said nature abhors a vaccuum up to the height of 32 feet. According to Darwinism, nature must hate transitional forms—her hate extending even to their fossils.

4. There is a further consideration:

According to Darwinism there must have been large and well-formed fish, a little inferior to the Ganoids, but preceding them, in the Devonian age. But why are the remains of these predecessors of the Ganoids not found? The fossils of smaller and feebler animals, both earlier, contemporary and later, have been found. Why not these? Why are the remains of the immediate predecessors and successors of the huge animals of the Miocene not found? The remains of many species of animals, much smaller and feebler, of animals antecedent, contemporary and subsequent have been found. Also, why is there a gap between man and his nearest of kin among the lower animals? Darwin has said, "The great break in the organic chain between man and his nearest allies cannot be bridged over."[1] But why? Fossil men have been found and fossil monkeys have been found. If there had been an intermediate species, animals perhaps less in size than men, but larger and stronger than most of the monkeys, would not some of their fossilized remains have been found?

5. It is admitted by some of the ablest geologists, including some evolutionists, that the gaps and breaks are not confined to the geological record, but existed in the series of successive species. We have shown that Le Conte repeatedly admits that there are, in the organic chain, gaps and breaks which he accounts for by what he calls *paroxysms* and *rapid movements* in evolution. Dana declares that *the transitions between species, genera and tribes in* geological history are, with rare exceptions, *abrupt*. He affirms "the abruptness of transition to be astounding."[1]

The admissions of these able and accomplished geolo-

(1) *Descent of Man*, p 156.
Manual of Geology, pp. 600, 602.

gists, (evolutionists as they are,) are decidedly unfavorable to the Darwinian theory of the formation of species by slight modifications through long periods of time, and also to the Darwinian notion of the extreme imperfection of the geological record.

6. There are three ways in which the abrupt transitions called gaps, breaks and chasms in the vital succession of the world, are accounted for by evolutionists. (1), imperfection of the geological record; (2), paroxysms of rapid evolution; and (3), the expectation that the fossil remains of intermediate species will yet be found in the earth's strata.

In regard to the last it may be said that those who adopt this mode of accounting for breaks in the organic chain, seem to be endeavoring to imitate the Bible characters who walked by faith, and not by sight. But as we think that disbelief in the Darwinian hypothesis is no impeachment of the veracity of God or man, we deem it reasonable and right to wait until the fossils of the intermediate and imperfectly formed species shall have been actually discovered, and also some half-formed species, or some animals among earth's living fauna partially transmuted into a new species, shall have been pointed out to us, before we give in our adhesion to Darwinism.

CHAPTER VI.

THE FAILURE OF DARWINISM AS AN EXPLANATORY HYPOTHESIS.

It is claimed in behalf of Darwinism that it explains many things that otherwise are inexplicable. Darwin himself gave, as the main reason for believing in his own hypothesis, that "it collects under one head of view and gives a rational explanation of many apparently independent classes of facts." [1] Again: "I cannot believe that, if false, it would explain so many whole classes of facts, which, if I am in my senses, it seems to explain." [2]

Hæckel claims, in behalf of Darwinism, that "all biological facts are explicable only through it, and that without it they remain unintelligible miracles." [3]

Spencer claims that "the power of this hypothesis to explain so many phenomena is strong evidence of its truth," [4] though of course he avoids the extravagance of Hæckel. This claim is also put forward by Huxley, Romanes, Le Conte, Fiske, and by Darwinists in general.

We do not admit this claim. We maintain that Darwinism is a failure as it respects the explanation of phenomena, and therefore lacks the main character even of a good hypothesis.

1. *Heredity and variation.* Darwin himself admitted our profound ignorance of these laws, the very ones on which natural selection is founded. Among his declarations are the following: "Our ignorance of the laws of variation is profound. Not in one case out of a hundred can we pretend to assign any reason why this or that differs more or less from the same part in the parents." "The laws governing inheritance are quite unknown." [5] Hæckel,

(1) *Variation of Plants and Animals* vol. p. 14.
(2) Darwin's *Life and Letters*, vol. 2, p. 6. (3) *Hist. of Creation*, Vol. 1, p. 123. (4) *Biol.* Vol. 1, p. 291.
(5) *Origin of Species*, pp. 19, 150.

though he boastfully claims that Darwinism has put us in a position to demonstrate an active cause for all the known morphological phenomena in the animal and vegetable kingdoms, is nevertheless constrained to admit that Adaptation and Inheritance are two mysterious properties, of which there is no prospect of an explanation in the near future. [1] Prof. Jevons, of College University, London, a distinguished Darwinist, puts the case thus: "Any one of Mr. Darwin's books admirable though they all are, consists but in the setting forth of a multitude of indeterminate problems." [2]

It is thus conceded that Darwinism can assign no cause either for heredity or variation, but continually deals with them without attempting an explanation.

2. Darwinism also finds itself unable to account for the *sterility of intercrossed species and the fertility of intercrossed varieties.* Darwinists admit these facts in whole or in part, argue about them and try to show that they are not incompatible with the Darwinian hypothesis. But they cannot assign the cause or causes of these facts. It is quite evident that the infertility of hybrids is essential to the preservation of distinct species and does actually keep them distinct. And it is the belief of many that this infertility of hybrids was *designed* by the Maker and Ruler of the universe to accomplish this very purpose. But the thorough-going Darwinists, many of them at least, are quite shy of final causes and all teleological views, and thus accept the sterility of intercrossed species and the fertility of intercrossed varieties as mysterious facts without cause or reason.

3. *The existence and equilibrium of the sexes.* These phenomena, according to Darwinism, are insoluble enigmas. It assigns no cause, and can assign no cause whatever, for them. Many of us are indeed ready to say that the two sexes exist in order that species may be propagated and preserved. But this is teleology. Such expressions suggest cause indeed, but only *final* cause, *i. e.*, *design* or *purpose.* But Darwinism, as generally construed, will have nothing to do with final causes; perhaps it does not positively condemn teleological ideas, but gives them the go-by. Now there are no *known* secondary causes for the existence of the two sexes among mankind and the lower animals.

(1) *Hist. of Creation*, Vol. 1, p. 32. (2) *Principles of Science*, p. 764.

Secondary causes are merely the means by which effects are produced. There are undoubtedly secondary causes for the existence of the sexes—means by which their continued existence is maintained. But these secondary causes are altogether unknown.

This may be said also of the equilibrium of the sexes. It is very desirable that it should be preserved; and it is preserved both among mankind and the lower animals. Statistics indeed seem to show that among mankind the number of male infants exceeds the number of females. But the excess is not more than enough to compensate for the greater mortality among men than among women, caused by the more dangerous pursuits of the former. But the equality of the sexes in point of numbers is not under human control. Neither is the determination of sex a matter of human choice and regulation. If it were so, the equilibrium of the sexes would not likely be preserved. But it is preserved and preserved too in a way altogether unknown to men. Doubtless secondary causes or means are employed to accomplish this purpose. It is certainly very improbable that the Great First Cause, the Inscrutable Power (as spoken of by Spencer) directly intervenes to determine the sex of every embryo and to maintain the equality of the sexes. God does this by secondary causes, which He has kept concealed from men, possibly lest they should attempt to take the control of these matters into their own hands. Here is a case in regard to which Darwinism is struck dumb. It knows not the cause or causes of sex or of the equilibrium of the sexes. It cannot even take the ground that they have a *final* cause, for that involves teleology, the doctrine of *design*. Hence Darwinism, except it be of that sort with which Darwin at first set out (expressly recognizing God as Creator and Ruler), cannot assign any cause, either secondary or final, to such phenomena as the existence of the sexes and their equilibrium, but must regard and treat them as unaccountable enigmas.

4. *The vast differences that are found between species in respect to degrees of fertility.* As a general rule, small and weak animals breed rapidly; large and strong animals slowly. The whale brings forth but one or two at a time: the smaller fishes breed by hundreds, by thousands and even by millions. The elephant brings forth but one at a time, and only once in about three years. Its period of gestation, according to Sir Samuel Baker, is twenty-two months

and some days. [1] The rat and the mouse breed each several times a year, the litter numbering from seven to twelve. The small birds, as the wrens and tits, have each from ten to fifteen young, and often two broods in a year. The golden eagle has annually but two eggs, and sometimes only one.

The vegetable kingdom furnishes similar phenomena. A fungus produces more spores in one night than an oak tree produces acorns in a century. During the time which a cocoanut tree takes to get ready to bear fruit, a wheat plant will have enough of descendants, if they all lived and multiplied, to fill the earth.

The smallest, most helpless, most easily destroyed creatures are the most prolific. The queen-ant of the African Termites lays 80,000 eggs in 24 hours. The gordius (hair-worm) lays 8,000,000 in less than a day. The paramecium will produce by fissure 268 millions in one month. Another animalcule "is calculated to generate 170 billions in four days." [2]

Now it is easy in one way to assign a reason for these facts. We can very readily see and say that small and weak animals should breed rapidly, and that large and strong animals, especially carnivorous ones, should breed slowly. Rats and mice, if they bred no faster than horses and cows, would soon become extinct. Horses and cows, if they increased as fast as most of the smaller animals, would starve to death. The whales, if they propagated as rapidly as do many of the fishes, would soon crowd the ocean and block ships in their course. Things are as they should be. Evidently the increase of the various species is so regulated as to preserve their equilibrium. Whoever believes there is a God in heaven, and reasons in accordance with logic and commou sense, will certainly conclude, that the more rapid increase of the smaller aud weaker animals, and the slower increase of the larger and stronger, are designed to prevent the extinction of the one class, and the too great predominance of the other.

But, according to Darwinism, these phenomena are unaccountable. There is no known cause of the great fertility of small and weak animals, and no known cause of the slow increase of large and strong ones. The Darwinist

(1) *Wild Beasts and their Ways*, p. 70.
(2) Many of these facts are taken from Spencer's *Biology*, Vol. 2, p. 423-459.

may recognize it as a fortunate thing indeed that the former class of animals are very prolific, but he sees no reason why they actually are so. He may recognize the slow increase of the latter class as another fortunate thing, but it also is to him an enigma. If great fertility is an advantage the larger and stronger animals are deprived of it; if slow increase is an advantage, the small and weak animals are deprived of it. But whether advantageous or disadvantageous, Darwinism can only accept these phenomena, as it accepts variation and heredity, i. e., as existent facts without any known reason for their existence.

5. Another example may be drawn from some *apparent exceptions to the rule of fertility as mentioned above.* The codfish is five feet long and weighs 100 pounds, yet it produces a vast number of eggs. Spencer says it "spawns a million at once." [1] Holder says: "Each female deposits about 9,300,000 eggs." [2] According to either statement, the cod is vastly more prolific than most animals of its size, and than some of the smaller fishes. But the eggs and the young are without protection and most of them perish. The eggs rise to the surface and float, being hatched in about 20 days. But the most of them are devoured before they are hatched, and many of them afterward. After all, the cod does not increase more rapidly than other animals of the same size. On the other hand the arius, a fish only six or seven inches long, produces only 10 or 12 eggs; but they are as large as marbles, and are carefully protected by both the female and male. They are carried first by the mother in a fold of the skin, and later the male carries them in his mouth. [3] The salmon are smaller than the cod, yet produce a less number of eggs. But they exercise much care for their safety. They ascend rivers in the breeding season, leaping water-falls with great skill and deposit their eggs in nests. In time the young salmon leave the fresh water, descending the rivers to the ocean. So too the stickleback, though a small fish, produces comparatively few eggs. But the sticklebacks are nest-builders and are "noted for their care of young." [3] The hippocampus (pipe-fish) also produces comparatively few eggs, but it very carefully protects its eggs and its young, the eggs being carried by the male in a caudal pouch. In

(1) *Biology*, Vol. 2, p. 433.
(2) *Elements of Zoology*, p. 187.
(3) Holder, *Elements of Zoology*, p. 169.

time he forces the young out by pressing the pouch against a stone. [1]

The ostrich, though much the largest of birds, lays as many as 15 or 20 eggs, some say about 30. [2] It at least produces more eggs than the eagle or the hawk, or than the oriole or sparrow, But the ostrich is careless of its eggs and its young. Its nest is merely a hollow place in the sand. The eggs are left to the heat of the sun by day, and are covered by the male ostrich at night. The female does not brood at all. As this bird is polygamous many of the nests are neglected by night as well as by day. The eggs in the outer row are often eaten by the old and young birds. Several females lay eggs in one nest, so that the number varies from 20 to 40, and even to 50, or sometimes to 70 or 80. Of course, in such cases, many of the eggs are not hatched. Darwin says: "In one day's hunting I picked up no less than twenty lost and wasted eggs." [3] These were scattered away from the nests. [4] There is one species of the ostrich, the emus, in which the male not only performs the duty of incubation, but has to defend the young from their mother; "for as soon as she catches sight of her progeny she becomes violently agitated and, notwithstanding the resistence of the father, appears to use her utmost endeavors to destroy them." [5] Many facts demonstrate the accuracy of the description of the ostrich presented in the book of Job: "which leaveth her eggs in the earth, and warmeth them in the dust, and forgetteth that the foot may crush them, or that the wild beast may break them. She is hardened against her own offspring, as though they were not hers; her labor is in vain without fear, because God hath deprived her of wisdom, neither hath he imparted to her understanding." [6]

Though the ostrich is prolific in eggs, her deficiency in the maternal instinct, and lack of care for her eggs and her young, are such that the species does not increase disproportionately fast. The abundance of eggs and the negligence in hatching and rearing counter-balance one another.

The bat does not breed as rapidly as other animals of

(1) Holder, *Elements of Zoology*, p. 191.
(2) Packard's *Zoology*, p. 208.
(3) *Origin of Species*, p. 194.
(4) *Voyage of a Naturalist*, vol. 1, p. 116.
(5) *Descent of Man*, p. 178.
(6) *The Book of Job*, 39 : 14–17.

the same size. It produces but one at a time, like the horse, cow, lion, tiger, elephant, and most of the larger animals. It does not need to breed rapidly. For it remains in concealment during the day, hybernates in winter, and the owl is about the only enemy it has to fear. It is as safe as most of the larger animals, and it breeds no faster than they.

Here, then, is another class of facts which Darwinism has no power to explain. It assigns no cause for the slow increase of the large and strong animals, and for the greater fertility of the small and weak ones. Surely weakness and exposure to danger do not promote fertility, nor strength and security tend to produce sterility. Nor is there any reason to believe that strong parental instinct and loving care of offspring tend to decrease fecundity. But here are the facts: small, weak, timid animals are very prolific; the smallest and weakest animals are the most prolific; animals that neglect their young are very prolific; large and strong animals are not very prolific; the largest and strongest animals are the least prolific; animals that are very careful for their young also increase slowly. Neither natural selection, sexual selection, use and disuse, nor any other cause or principle which Darwinism suggests, accounts for any of these phenomena.

But this much is evident, that great fecundity exists wherever it is needed; wherever it is not needed, slow increase is the rule. The species that can be destroyed and are destroyed in large numbers, are very prolific, and thus their extinction is prevented. The species that can and do protect themselves, increase slowly, and thus their too great predominance is prevented. The species that neglect their offspring, need to breed rapidly in order to maintain their existence, and they do breed rapidly. Those that care for and preserve their young do not need to breed rapidly, and as a matter of fact, they do not.

Admitting, then, that there is an intelligent, regulating power in the universe, we can account for the various degrees of fecundity among existing species. They are adapted and designed to prevent extinction of species on the one hand and undue predominance on the other.

6. *Natural malformations and monstrosities.* Of these Darwinism gives no rational account. This failure might not be to its discredit, since no other scheme accounts for

them, were it not for the claims that have been made in its behalf.

Darwin's teaching on the subject is as follows: In one place he states that unnatural treatment of the embryo causes monstrosities, but he does not claim that *all* monstrosities are thus caused.[1] Again he says that a large number of monstrous growths and lesser anomalies are due to arrest of development, but he admits that many monstrosities cannot be thus explained.[2] He however most frequently classes monstrosities as variations, thus: "Monstrosities cannot be separated by any clear line of distinction from mere variations."[3] "Monstrosities graduate so insensibly into mere variations that it is impossible to separate them."[4] But classing monstrosities as variations is a virtual confession that the former are unaccountable; for variation is assumed as a fundamental fact which admits of no explanation. Yet, after all, Darwin was inclined to attribute malformations and monstrosities to latent characters and tendencies, and to account for them by reversion or recurrence.[5] Prof. Drummond goes the whole figure in attributing malformations and monstrosities to reversion. He maintains even that club-footed people derive their deformity by inheritance from gorillas. He declares that "club-foot is simply gorilla foot."[6]

It seems to us that none of these suggestions and speculations account for malformations and monstrosities, and that men, who write as above, are hugely mistaken.

There are various kinds and degrees of natural malformation—infants born with fewer than five fingers on each hand; with supernumary fingers; with crooked fingers; with but one hand; without any hand; with but one arm; without any arm; without hand or arm; with two pairs of arms and hands; with but one leg; with three legs; without any leg; without either arm or leg; with feet on the shoulders and hands on the hips; with two heads; without a head; without a heart; without either head or heart; with two faces; with the face turned backward; with the face turned side-wise; with one head

(1) *Origin of Species*, p. 15.
(2) *Variation of Plants and Animals*, Vol. 2, p. 31-2.
(3) *Origin of Species*, p. 15.
(4) *Variation of Plants and Animals*, Vol. 2, p. 241.
(5) *Descent of Man*, p. 35-6.
(6) *Ascent of Man*, p. 95-6.

and two bodies; with one head, two bodies and one pair of legs; a head without a body. Voltaire, in his article on *monsters*, states that he had seen a woman who had on her breast the four teats and the tail of a cow. He also speaks of a girl born with a crawfish on her neck and the tail of a rat on her thigh.[1]

Malformations are not confined to the human race; they are found among the lower animals. The writer, in his boyhood, saw on his father's farm in Preble county, Ohio, a lamb with its head set on its shoulder. Some years ago, on a farm in Greene county, Ohio, near Xenia, there was born a calf with two heads and six legs. The writer, a few years ago, in Xenia, Ohio, saw, on public exhibition, a colt, about two years old, without fore-legs, which otherwise was well formed and in good condition.

Voltaire closes his article on monstrosities, referred to above, with the words, "*Que sais-je?*"[2] (What do I know?)

Since Voltaire's time, there have been much investigation and writing in reference to malformations, but they are no better understood now than then They are indeed classified, but not accounted for, though indeed many imagine that to classify is to explain. The phrases "arrest of development," "redundant growth," and many others employed by writers on this subject, do not assign causes, and in reality do not go one whit beyond Topsy's account of herself—"*I specs I jus growed.*" And Darwinism too is utterly helpless so far as explaining these monstrosities is concerned. The nature of many of them is such that the notion that they originate by reversion is absurd and intolerable, aside from the fact that reversion itself is inexplicable. Are we to believe that there existed in former times monstrous creatures, *normally* monstrous creatures, from which malformations and deformities descend by the law of inheritance? Is it credible that among the ancestors of men there were deformed and defective races of beings—three-legged, one-legged, and no-legged creatures; creatures without heads; with two heads; with Janus-faced heads; with faces turned side-wise or backward; or creatures fastened, two and two together, existing thus in a normal condition and begetting offspring like themselves? Even the notion that once among the ancestors of men there was a race of double creatures, like

(1) *Dictionnaire Phil.*, Monstres.
(2) *Dictionnaire Philosophique*, vol. 4, pp. 69, 70.

the Siamese twins, seems to us absurd and incredible. If any man thinks that logic and common sense allow him to conceive and entertain such notions, be it so; we do not argue with him. But it seems to us it were better at once to say that this whole subject of malformations and monstrosities is a profound mystery. There are malformations and monstrosities occurring from time to time, the very sight of which produces horror in every beholder and strikes dumb investigating enquirers. Were there no other forms than these, or if these were predominant; were it not for the wonderful and ingenious contrivances and adaptations, which appear around us, it would be impossible to believe that the world is governed by wisdom and benevolence. But these imperfect, deformed and monstrous creatures are exceptional and unaccountable. We know not *why* they exist. To claim that they are explained by Darwinism is preposterous. Better to say with Voltaire, "*What do I know?*"

7. *The facts in regard to bees and other insects.* These facts are as follows: In the bee-hive there is, properly speaking, but one female, the so-called queen, which is merely a breeder. The drones are the males, of which there are hundreds in every hive during the breeding and working season. The queen is impregnated but once, and the drone, which impregnates her, loses his life in the act. The working bees, of which there are thousands, as many as fifteen or twenty thousand, in the hive, called neuters, are in general altogether sterile. In the absence of a queen, or in case of an infertile queen, these sterile workers sometimes deposit eggs, which produce only drones. An unimpregnated queen also lays eggs, from which only drones are hatched. There are also sterile workers among the ants as among the bees. Now the impossibility of the origination of these so called neuters through natural selection is suggested by their sterility. Fertility and inheritance of slight modifications from generation to generation are essential to natural selection. Hence the origin of these sterile neuters in this way is clearly impossible. Darwin, with his usual candor, admits that at first the difficulty appeared to him insuperable and actually fatal to his whole theory.[1] He, however, takes up the case of neuters among ants, and tries to show that they may possibly have been originated in the way his hypo-

(1) *Origin of Species*, p. 209.

thesis demands. Success for this effort is claimed by Mr. Fiske, who speaks of "the signal success with which Mr. Darwin has explained the existence of neuters, or sterile females, among bees and ants." [1] But, (1.) Darwin attempted not to explain or to account for the existence of these neuters, but only to show why he believed their Darwinian origin *possible*. (2.) He assumes as an actual fact the origin of these neuters by natural selection and then declares that with all his faith in his own hypothesis he would never have anticipated that natural selection could have effected so much, had not the case of these neuters convinced him of the fact. [2] The viciousness of this proceeding in a logical point of view is evident. The question is, could natural selection produce neuters among bees and ants? Ought we to believe this result possible? "Yes (answers Mr. Darwin), but I would never have believed it possible, had not the actual origination of these neuters by natural selection convinced me of it." Mr. Fiske exclaims, "Signal success!" (3.) The existence of these steriles involves a series of difficulties, which neither Darwin nor any one else has attempted to solve. Darwin admits that there are many instincts very difficult of explanation, which may be opposed to his theory of natural selection; that there are cases in which we cannot see how an instinct could possibly have originated; that there are cases in which no intermediate gradations are known to exist; that there are cases of instincts so very nearly the same in animals so remote in the scale of nature that we cannot account for their similarity by inheritance from a common parent; that how the workers have been rendered sterile is a difficulty; that the prodigious difference between the working ants on the one side, and the genuine males and females on the other, constitutes "the great difficulty;" further, that, in case of the steriles, acquired modifications and instincts could never have been transmitted by inheritance; [3] and, that the climax of the difficulty is that, among several kinds of ants, the neuters are divided into several castes, differing from one another as well as from the fertile males and females, sometimes to an almost incredible degree. The most of these difficulties Darwin does not touch. All these difficulties, for many of

(1) *Cosmic Philos.*, Vol. 2, p. 20.
(2) *Origin of Species*, p. 214.
(3) *Origin of Species*, pp. 209-211.

which there is no solution even proposed, taken together intensify the impossibility of the production of these sterile neuters through natural selection. (4.) The truth is that the constitution of the bee and ant communities presents a large number of anomalies and mysteries, the most of which are not only unaccountable, but also impossible according to Darwinism. Why is breeding limited to one female called the queen? Why is the queen, although she has hundreds of husbands, impregnated but once? Why does the drone, that impregnates the queen, lose his life in the act? Why is the queen by one impregnation rendered completely fertile ever afterward? Why does an unimpregnated queeen produce off-spring? Why does this fatherless offspring always turn out to be drones? Why are the workers, imperfect females as they are called, infertile? Why are they imperfect? Why do they become prolific in the absence of a queen, or in case of an infertile queen? Why, when they do breed, are their progeny always drones? Why are the legitimate working-bees so very different from both their parents in form, size, instinct, artistic skill and industrial habit? How are queens, drones and imperfect female workers all developed out of the one common kind of eggs and grubs? What different kinds of treatment, or of food, or of chemistry, do the workers employ to produce so widely different results? Why is the queen, so peaceful and gentle in general, so fierce and deadly in her hostility against all rivals, stinging to death her own sisters and daughters? Why is but one queen tolerated in a bee-hive, while several are often found in an ant's nest? [1] Why the difference?

Such are some of the anomalies, mysteries and impossibilities which confront Darwinism in its effort to explain phenomena as originating through natural selection and the struggle for existence. This taking up of a *few* phenomena and pointing out that their existence does not perhaps give the lie to Darwinism, while hundreds of mysteries and anomalies are left untouched, is absurd. Sir John Lubbock, in reference to such matters as are above referred to, says: "The exact mode by which the differences are produced is still entirely unknown." [2]

8. There are *assumed or asserted in Darwinism as facts many things that are not explained.* Of these we present

(1) Lubbock's *Ants, Bees and Wasps*, p. 19.
(2) *Ants, Bees and Wasps*, p. 23.

the following as specimens.

It is asserted as a fact that only a few species are at any one time undergoing modification, while the great majority of species are stationary; but no cause is assigned. It is asserted that many species remain unchanged through enormously long periods, and that some species have remained unchanged from the dawn of life to the present time, through all the geologically recorded ages; but no cause is assigned. It is asserted as a fact that only some individuals or some varieties of a species, are ever transmuted into a new species, while some individuals or some varieties persist in the old form and keep up the old species; but no cause is assigned. It is asserted that, while some individuals or some varieties of some species are transmuted into new species, the great majority of species are permanent and finally become extinct without leaving descendants of any kind; or, if it is asserted, as by Le Conte, that some species become rigid and others remain or become more plastic, no cause is assigned for the difference.

Thus Darwinism goes on and on, setting forth facts or claimed facts, without giving any explanation, and doubtless because no explanation can be given.

9. Besides all this, we meet in Darwinian books and elsewhere, with *countless facts, of which Darwinism gives and can give no explanation.*

Take, as an example, the fact alluded to above that the female ostrich, and especially the females of the emu branch of the ostrich family, are deficient in the maternal instinct. Darwin expresses, but does not explain, the fact by saying that the male emu has to protect the brood from their mother in order to keep her from destroying them. The Bible more accurately expresses the fact, and also accounts for it, by saying, "She is hardened against her young ones as though they were not hers; her labour is in vain, without fear; because God hath deprived her of wisdom; neither hath he imparted to her understanding." [1]

But, according to Darwinism, why is the mother ostrich hostile to her own offspring? Of what benefit is this hostility either to the mother herself, to the offspring, or to the species?

Darwin found, at Bahia Blanca in South America, a black toad (phryniscuss nigricans) with red feet and stom-

(1) *Job* 39:16.

ach. He describes it, as follows: "If we imagine, first, that it had been steeped in the blackest ink, and then, when dry, allowed to crawl over a board, freshly painted with the brightest vermilion, so as to colour the soles of its feet and parts of its stomach, a good idea of its appearance will be gained. If it had been an unnamed species, surely it ought to have been called *diabolus*, for it is a fit toad to preach in the ear of Eve." [1] Darwin did not account for the colors of this toad, bnt Fiske has tried to do so. The latter, however, is silent in regard to the brilliant red of its feet and stomach, and fails to tell why its body is black rather than white or yellow.

As illustrations of the weakness of Darwinism as an explanatory hypothesis we suggest the following queries:

Why does not hair grow on the human forehead? Why does hair grow on the human head? Why are women beardless? Why does the male human voice change at the age of puberty? Why are some dogs hairless? Why have hairless dogs imperfect teeth? Why are white tomcats almost invariably blind? Why do deaf-mutes, even when intermarried, not transmit their peculiarity to their offspring? (This is declared by Darwin to be unintelligible. [1]) Why do dogs, in running, often hold up one hind leg? (It will hardly be maintained that the ancient ancestors of dogs had but one hind leg apiece, or that one hind leg or one hind foot was generally rheumatic or sore and had to be held up.) How are the horny excrescences that are found on the inside of the legs of horses, both before and behind, to be accounted for? Are they to be classed as rudimentary organs, relics of the spurs worn by the ancient ancestors of the horse? They are not in the right place for spurs, and besides they are possessed by females as well as by males. Possibly their design and use are to excrete excessive matter. But, in that case, will natural selection account for them? Are we to believe that formerly horses without such appendages fared badly in their environment and in the struggle for existence, and hence dwindled away and finally died out altogether?

Why is it that that the tails of no wild animals curl? Why are humming-birds confined to the New World, and pheasants to the Old? (The American pheasant so-called is the grouse. [2]) Why is it that all animals with horns

(1) *Voyage of a Naturalist*, Vol. 1 p. 124.
(2) *Variation of plants and animals*, Vol. 1 p. 465-6.

and cloven hoofs chew the cud?

What determines color, shape and other phenomena in the vegetable and animal kingdoms? Why are lilies white, the roses red, the violets blue, the sun-flowers yellow? Why is the breast of the yellow-hammer spotted? that of the robin, brown; that of the woodpecker, white? Why is the peach leaf oblong; the apple leaf, oval; the maple leaf, deeply notched; and the cottonwood, triangular? Why are the edges of the leaves of various species so different, dentate, saw-toothed, scalloped, wavy, sinuate, jagged, lobed, cleft, etc.? Why are some flowers staminate and others pistillate? What determines the number of sepals and petals? What causes the regular, delicate and beautiful spots and tints found in many of the species of flowers? Why are not all the flowers thus adorned?

We might thus proceed to almost any length and fill a whole book with the simple enumeration of phenomena which Darwinism does not and cannot explain. It fails to assign causes not only for a vast number of phenomena in the inorganic and organic worlds, but also for the very facts and laws on which it claims to be based or in which it consists. The phenomena it explains, or claims to explain, are but as a drop of the bucket compared with the ocean of facts which it ignores. Even granting all that is claimed for it in the way of accounting for things, we cannot but regard it as being in this respect a dead failure.

Nor could it be otherwise; for no principle or hypothesis, which leaves out Mind, Thought and Foresight can account for the grandeur and beauty, harmony and uniformity, ingenious contrivances and wise adaptations, that are found amid the variety and complexity of the universe. Granted a wise and contriving Mind, the Maker and Manager of the universe, we have an adequate cause of all things, though the secondary causes or means in many cases are at present, and perhaps may remain forever, unknown.

CHAPTER VII.

THE HOMOLOGICAL ARGUMENT.

THE homology, which, as we hold, furnishes an argument against Darwinism, is the similarity, including identity, which characterizes many genera and species existing in distant and different ages and countries; and which, if Darwinism were true, ought to characterize all genera and species existing in the same age and country.

The main point in the argument is this, that if Darwinism were true, the homology *would not exist in many places where it does, and would exist in many places where it does not.*

According to Darwinism, heredity and variation are constant factors in this sense that they operate irrespectively of environment. Everywhere, and in all ages, plants and animals transmit their own qualities and peculiarities to their offspring. Everywhere, and in all ages, offspring differ by slight modifications from their parents. Everywhere and in all ages, it is climate and other circumstances that make inherited modifications useful or useless, and hence determine what modifications shall be preserved and increased. Climate and other circumstances, which are included in what is called environment, are therefore potent in promoting differentiation and in the transmutation of species. Hence if Darwinism be true, differences in environment must produce differences in species; animals and plants, widely separated in time, and by many degrees of latitude, must be unlike; and species living in the same country and climate, and in the same circumstances, must be assimilated more and more. Especially would we not expect, if Darwinism be true, that flora and fauna widely separated by time and space would continue identical; on the other hand, we would confidently expect that heredity, variation and environment (natural selec-

tion) would at least in an age differentiate them and make of them different genera and species.

But this is just what has not taken place. For we find widely different genera and species living in the same country, climate and environment, generation after generation and age after age, and without any indications of assimilation ; and we find similar genera and species, and even identical genera and species, separated by vast distances and many degrees of latitude, living in widely different climates and environments, yet remaining identical or similar, generation after generation, and age after age.

We will present proofs and illustrations of the two following facts taken together : viz, the similarity (including identity) of genera and species in widely different environments, and the dissimilarity of genera and species in similar environments.

Darwin concedes and copiously affirms both these facts. In discussing the geographical distribution of species, he states that there is hardly a climate or condition in the Old World which cannot be paralleled in the New and then exclaims, "Notwithstanding this parallelism of the Old and New Worlds, how widely different are their productions."[1] Again, he speaks of large tracts of land in Australia, South Africa and Western South America, as having "parts extremely similar in all their conditions," and then says, "yet it would not be possible to point out three faunas more utterly dissimilar."[2] He states that "no two marine faunas are more distinct" than those separated by the narrow isthmus of Panama.[3] He further speaks of "the same species on the summits of distant mountain ranges, and at distant points in the arctic and antartic regions."[4] He states the fact that "the plants on the White mountains, in the United States of America, are all the same with those of Labrador."[5] He quotes the declaration of Dana that "it is certainly a wonderful fact that New Zealand should have a closer resemblance in its crustacea to Great Britain, its antipode, than to any other part of the world."[6]

These facts are fully recognized by Agassiz. The title of one of his sections is, "*Simultaneous existence of the most diversified types under identical circumstances.*" and of

(1) *Origin of Species*, p. 302-3. (2) p. 303. (3) pp. 103-4.
(4) *Origin of Species*, p. 309. (5) p. 315. (6) p. 327.

another is, "*Repetition of identical types under the most diversified circumstances.*"[1] In view of such facts, he affirms that "organized beings exhibit the most astonishing independence of the physical causes under which they live."[2]

These facts are recognized also by Spencer, who quotes largely from Darwin on this subject. He quotes with approval Darwin's declaration that, on the one hand, we have similarly-conditioned and sometimes nearly adjacent areas, occupied by two different faunas. On the other hand, we have areas remote from each other in latitude, and contrasted in soil as well as climate, which are occupied by closely-allied faunas."[3]

We assume, then, as proved and admitted that similar and even identical genera and species exist in widely distant and widely different environments ; and widely different genera and species in similar, and even identical environments.

It is scarcely necessary to remind the reader that the most diverse plants and animals are often found together in the same locality and environments—oaks and daisies, pines and pinks, turkey-buzzards and humming-birds eagles and doves, buffaloes and grasshoppers, crocodiles and minnows, elephants and musquitos, whales sharks and corals. These are examples of diverse animals found in the same regions and environments. On the other hand, man is a good illustration of the fact of the same species living in all sorts of environment, being found in almost all countries, climes and latitudes. Nor has he anywhere been transmuted into another species.

But, according to Darwinism, identical genera and species existing in different countries and latitudes, being differentiated more and more, would become new genera and species. Heredity and variation being constant factors, and environment also continually operating to develop useful organs and qualities and to eliminate useless ones, the result must be, in the end, transmutation.

The Darwinists overlook this matter. They call attention, as is shown above, to the facts of the existence of similar and identical species in widely distant and widely different regions. But they do so for the purpose of framing an argument in favor of the migration of species and in opposition to special creations. We will hereafter show

(1) *Classification*, pp. 12, 16.
(2) p. 17. (3) *Biology*, vol. 1, p. 388.

that the traditional view is entirely consistent with the theory of migrations. [1] But we maintain that while migration might satisfactorily account for the coming together of different species, even of widely different species, into the same country and environment, it does not account for their refusal to be assimilated. Neither does it account for the persistence of species in their own peculiarities, living in widely separated countries and in utterly dissimilar circumstances. According to Darwinists these things ought not so to be, and indeed cannot be.

Perhaps the Darwinist is ready to plead that natural selection has not had time to do its work. He may say, in reference to this as to some other matters, "Just wait long enough and you will see the many species that exist in different countries and latitudes differentiating into different species, and the diverse species existing in the same environment and in the same circumstances assimilating into one.

There are some considerations, however, that make such predictions more than doubtful. In the first place, it is admitted that some genera and species have remained unchanged in spite of all the efforts of natural selection for millions and millions of years, in fact through all the geological ages. It is true that Dana does not admit this fact, but even affirms that no species of animals has survived through a single one of the several geological ages. [2] As we have shown, however, Darwin admits that some groups of species have endured from the earliest known dawn of life to the present day; [3] and Spencer declares that "some few species and a good many genera have continued throughout the whole period geologically recorded." [4] Besides, Darwinists are under the necessity very often of falling back on the idea of the persistence of species through immense periods of time, and of all but maintaining the invariability of species. So too, having as they think accounted for the existence of similar species in widely separated countries and in totally different circumstances, by migration, they seem to treat the persistence of these species in similarity to one another as a matter of course and of no concern.

According to these views, there has already been a

(1) See Chapter IX, pp. 424-455.
(2) *New Text-book of Geology*, p. 382.
(3) *Origin of Species*, *p.* 278.
(4) *Biology*, vol. I, p. 322.

long continued persistence. Variation, the influence of environment and natural selection, have been resisted for many ages. According to the views of many of the Darwinists man, and the animals associated with him, were on the earth before the glacial period. We say nothing about such calculations as those of Darwin, who speaks of an infinite number of generations and 300 millions of years since the latter part of the secondary period. But according to current views concerning the glacial period, we have many years of stability in man and his contemporaries—the glacial period 160,000 years—80,000 years since that period—240,000 years since the beginning of the glacial period—men with dogs and cattle on earth long before this—the human period, in all perhaps 400,000 years. [1]

During this long period, men have been living in almost all countries and climes, subject to heat and cold, moisture and drought, and to the vicissitudes of almost every sort of environment; and yet there is but one human species. Thus it appears that natural selection has had abundant opportunity to do its very best or its very worst with man—to elevate or degrade him—has had him as a subject of experiment in almost all kinds of circumstances and for hundreds of thousands of years; and yet there are no indications of the introduction of a new human species.

The same may be said in regard to dogs, cows, and other associates of man. Among them all there are no indications of an approach to transmutation. It would seem that natural selection, even with the accompaniments of the glacial period to aid it, has proved a failure.

In view of such facts as are above presented, Prof. Le Conte finds it necessary to bring in certain modifications of the doctrine of evolution.

1. He suggests that evolution is not *uniform*, but *paroxysmal*. These are his own words. He admits, however, that nearly all evolutionists have assumed and even insisted on *uniformity*.

2. He takes the ground that most species become rigid and remain unchanged, and that only the more *plastic* forms change into other species. [2] It would thus appear that natural selection only takes in hand the species or individuals that are more *plastic* and the easiest to transmute, and even then takes an immense period of time to do its

(1) *Fisk's Excursions*, pp. 75-6.
(2) *Evolution*, pp. 257, 266-7.

work. But these modifications of evolution are introdnced to meet the difficulties and objections, which are above suggested.

We claim that the traditional (or Biblical) theory corresponds to the facts in the case. Migration of species, as we will hereafter show, is implied in the sacred record. Now the migration of species accounts for the existence of similar species in distant and diverse regions, and the invariability of species accounts for the continuance of their similarity notwithstanding the differences of environment.

CHAPTER VIII.

THE IMPOSSIBILITIES OF DARWINISM.

I. ONE of the Darwinian impossibilities is the *existence of nascent or new organs.*

It is claimed that the function of natural selection is not to originate new organs, but only to preserve small and useful variations. Natural selection, it is claimed, disfavors everything that is not useful to its possessor. But an *incipient* organ cannot be of any use to its possessor. According to Darwinism, every organ at first is a slight modification. It cannot, therefore, be advantageous at first. Any organ, or part, that is useless must be worse than useless, an inconvenience and a waste of material. It is true that Darwin says: "A nascent organ, though little developed, as it has to be developed, must be useful in every stage of development." [1] And again, "Nascent organs, though not fully developed, are of high service to their possessors." [2] It is true that a nascent organ somewhat developed might be useful; and in the quotation given above, Darwin takes care to speak of a nascent organ as "a *little developed.*" But an incipient organ, one just beginning, is only a slight modification or variation. According to Darwinism, such must every new organ be at first. Hence no new organ at its first appearance can be in any degree useful to its possessor. It must begin to be developed before it can be useful. But it must be useful before it can begin to be developed. The Darwinist thus reasons in a circle. Half time he puts (in common phrase) the cart before the horse; or, rather he tries to make the horse to go wrong end foremost and to go two opposite ways at once, in affirming, as he does, that an incipient organ must be useful in order to begin to be devolped, and

(1) *Life and Letters*, vol. 1, p. 7.
(2) *Descent of Man*, p 12.

that it must be developed in order to begin to be useful.

Let no one accuse us of misrepresentation. Darwin says: "Natural selection acts solely through the preservation of variations in some way advantageous, which consequently endure." And again: "As natural selection acts solely by accumulating slight successive, favourable variations, it can produce no great or sudden modification; it can act only by very short and slow steps." [1]

Let it be observed, (1) that natural selection acts solely on slight and advantageous variations; (2) that natural selection acts solely through preserving and accumulating such variations; and (3) that every incipient organ appears at first in the form of a slight variation. In these conceptions is involved the absurd impossibility, pointed out above, as follows: certain slight variations endure because they are advantageous; they become advantageous because they endure, being preserved and accumulated through natural selection.

It appears that Darwin, admirable as he was for power of observation and induction, never perceived the absurd impossibility involved in his hypothesis of natural selection. But some of his disciples have been made both to see and feel it. It has been brought clearly before them by the Duke of Argyle, as follows:

"It follows, as a matter of necessity, that every modification of structure must have been functionless at first when it began to appear. . . . Things cannot be selected until they have first been produced. Nor can structure be selected by utility in the struggle for existence until it has not only been produced, but has been so far perfected as to be actually used."

Dr. Romanes, of England, attempted to break the force of the argument as thus presented by affirming that some incipient organs are useful from the very moment of their inception. He refers to the eye as an example, and, evolutionist-like, assumes it to have been at first the mere end of a cutaneous nerve sensitive to light. He declares that the little speck of black pigment, which he imagines the eye to have been at first, was advantageous to its possessor in enabling him to shun darkness and to seek the light. All this is mere conjecture. But, by the way, we presume that what are commonly called *freckles* may be taken as specimens of "the pigment spots in the skin," which Prof.

(1) *Origin of Species*, pp. 102, 408.

Romanes speaks of as incipient eyes just a little developed. Why did the learned professor not enlighten us in regard to the practical use of freckles, those pigment spots in the skin, which we know do exist as a matter of fact? It would seem, according to Darwinism, that, if freckled people would intermarry during many generations, and, if by means of geographical distribution, migration and isolation this variety of people could be kept from what is called "the swamping effect of cross breeding," there would be in time a race of people with eyes all over their faces, and a few on their necks and hands. But the practical use of freckles or other pigment spots in the skin, or of the sore ends of lacerated nerves, while they are still freckles, pigment spots, and mere sore ends of lacerated nerves, is to us not demonstrated, but altogether imaginary. No such incipent eyes, nor indeed incipient eyes at all, are known as matters of fact. Romanes takes his illustration wholly from the region of fancy.

In the same illogical and fanciful way, the Professor suggests that an organ useful for the performance of one function may become fitted for the performance of another and more important function. He refers as an example to the claimed transmutation of the swim-bladders of aquatic animals into the lungs of air-breathing animals. Here he assumes as a fact what is not known as such. Besides, he assumes that the swim-bladders were well developed before their metamorphosis into lungs. But the question at once arises, how could swim-bladders in their incipient stage, and therefore useless, begin to develop? While in that condition, natural selection would have nothing to do with them except to make war on them. Thus the difficulty is merely shifted, not removed. After all, Romanes virtually admits the validity of this argument against Darwinism. In the first place he claims only that *some* incipient organs can be useful, thus conceding that some of them could not be. This latter fact is sufficient to demonstrate the failure of natural selection, which is the main point of Darwinism. In the second place he admits "that natural selection can only begin to operate, if the *degree* of adaptation is already given as sufficiently high to count for something in the struggle for *existence;*" and he declares the failure to perceive this fact to be one of the *oversights* and *fallacies* of the followers of Darwin. He further declares their course in

reference to these matters to be *clearly illogical*.[1] In treating of these points, he writes as if he himself were not a Darwinist.

Prof. Le Conte goes still further in his admissions. He admits that an organ must be already useful before natural selection can take hold of it and improve it; that it can not make an organ useful, but only *more useful*, that until organs have attained a considerable size or are pretty well developed, they would seem to be a hindrance to be removed by natural selection instead of a benefit to be preserved and improved; and that many organs must have passed through this *incipient stage*, in which their use was prospective. Admitting these facts, he of course must admit that they are insuperable objections to Darwinism. Hence he takes the ground that "these are not objections to evolution or derivation, but only to *Darwinism*, or any other special theory as a *sufficient explanation* of the process of evolution."[2]

Thus Prof. Le Conte gives up natural selection as inconsistent with admitted facts. But what is Darwinism without natural selection? Without this, its main and essential notion, it is a shabby affair, worthy neither of advocacy nor opposition, an organism without a backbone, a tree without a trunk. Even Fiske, who is an ardent champion of Darwinism, has found it necessary to reject Darwinism as taught by Darwin. He speaks of "the acceleration of the diversification of species,"[3] which is directly opposite to Darwin's view and oft repeated declaration that natural selection is a slow and gradual process. Fiske also affirms that "the effects of natural selection are by no means limited to slight changes," which is another contradiction of the teachings of Darwin. Had Fiske paid sufficient attention to the argument against natural selection drawn from the notion of incipient organs, to appreciate its force, he would probably, like Le Conte, have felt constrained to admit its validity against Darwinism, and to fall back on the claim that it does not touch the general doctrine of evolution.

II. Another of the impossibilities involved in Darwinism is *the existence of rudimentary organs of the atrophied sort.*

(1) *Darwin and after Darwin*, Vol. 1, pp. 352-4, 275.
(2) *Evolution and its Relation to Religious Thought*, pp. 270-1
(3) *Cosmic Philos.* Vol. 1, p. 48.

Of course Darwinians insist on the existence of useless, atrophied and dwarfed organs, in men and the lower animals, and employ this real or supposed fact as an argument to prove the descent of modern from ancient species. Thus the advocates of Darwinism pretty generally maintain that the *os coccyx* (cuckoo-bone) in man, i. e., the curved termination of the spinal column, is the relic of a tail, and indicates that men have descended from long-tailed ancestors. Thus too the pelvic bones in whales are considered to be rudimentary legs and are claimed as evidence that the whale is descended from quadruped ancestors. It is further claimed that the two little supernumerary teats on the udders of cows, mammæ in men, fœtal teeth in whales, dew-claws in dogs, muscles in men for moving the ears and scalp-skin, hair on the adult human body, and many other organs and parts of organs, are claimed as rudimentary and as proofs of descent of species from former species.

Without discussing at this time the question whether or not there are in reality rudimentary organs, we maintain that, *according to Darwinism*, there can be none. Our proposition is, that, according to Darwinism, a rudimentary organ is an impossibility

There are two facts or principles set forth by Darwinism which demonstrate the impossibility of the existence of rudimentary organs at the present time. One of these principles is that such organs are *useless*, and the other is that useless organs must dwindle away and be *obliterated*. These principles do not indeed utterly forbid the existence of rudimentary organs, but they require their existence to be temporary. They suggest that if such organs ever did exist, they long since became extinct.

As to the first point, it is sufficient to state that the definition of rudimentary organs is that they are organs atrophied and dwarfed by disuse. It is indeed true that Darwin divides them into two classes—those that are "absolutely useless," and those that are of "such slight service to their present possessors that we can hardly suppose that they were developed under the conditions which now exist." But he immediately adds, "Organs in this latter state are not strictly rudimentary, but they are tending in this direction." [1] According to Darwin, then, true rudi-

(1) *Descent of Man*, p p 11-12.

mentary organs are *absolutely useless.*

Now, according to Darwinism, absolutely useless organs are an impossibility, for the reason that natural selection will make war upon them and obliterate them. Darwin says: "Natural selection is continually trying to economize in every part of the organization. If under changed conditions of life a structure before useful becomes less useful, any diminution, however slight in its development, will be seized on by natural selection, for it will profit the individual not to have its nutriment wasted in building up an useless structure." [1] Here natural selection is spoken of as operating against "structures once useful which have become less useful." Of course natural selection will, then, make war upon structures or organs that have become *absolutely useless.* But Darwin further says: "The principle also of economy, explained in a former chapter, by which the materials forming any part or structure, if not useful to the possessor, will be saved as far as possible, will probably often come into play, and this will tend to cause the entire obliteration of a rudimentary organ." [2]

The testimony of Hæckel is as follows: "If, for example, an organ degenerates from non-use, this degeneration ends finally in a complete disappearance of the organ, as is the case with the eyes of many animals." [3] He also speaks of rudimentary organs as being "imperfect and on the road to complete disappearance." [4]

Huxley has fully recognized the uncertainty and weakness of the argument drawn from rudimentary organs. Speaking of dysteleology (Hæckel's word for anti-teleology, the doctrine of "purposelessness") he says: "I confess, however, that it has often appeared to me that the facts of dysteleology cut two ways. If we are to assume, as evolutionists in general do, that useless organs atrophy, such cases as the existence of lateral rudiments of toes, in the foot of a horse, place us in a dilemma. For either these rudiments are of no use to the animal, in which case (considering that the horse has existed in its present form since the Pliocene epoch), they surely ought to have disappeared; or they are of some use to the animal, in which

(1) *Origin of Species*, p. 134.
(2) *Origin of Species*, p. 395.
(3) *History of Creation*, Vol. 1, pp. 249. (4) p. 12.

case they are of no use as arguments against teleology." Huxley speaks of mammæ in male mammals as presenting a still stronger case. Alluding to the fact that there are on record cases of the breasts of men becoming functionally active, though there is no mammalian species whatever in which the male normally suckles the young, he says: "There can be little doubt that the mammary gland was as apparently useless in the remotest male mammalian ancestor of man as in living men, and yet it has not yet disappeared. Is it then still profitable to the male organism to retain it? Possibly; but in that case its dysteleological value is gone." [1]

These views of Huxley concerning rudimentary organs were by no means satisfactory to Darwin, and he remonstrated against them. He wrote to Huxley as follows: "I write (requiring no answer) to groan a little over what you have said about rudimentary organs. Many heretics will take advantage of what you have said." [2]

The cause of Darwin's dissatisfaction is quite evident. The *heretics*, as he called them, are the opponents of Darwinism.

We present the testimony of one more witness, that of Prof. Le Conte, who speaks of rudimentary organs as useless, and then says: "They are not, however, shed or dropped bodily at once. No; they are retained by heredity, but dwindle by disuse more and more until they pass away entirely." [3]

Of what has been shown concerning the impossibility of rudimentary organs, this is the sum:

(1.) Darwinists declare them to be useless. This is implied in the claim that they are disused. Darwin declares it to be a matter of astonishment, that while it is plain that most parts and organs are exquisitely adapted for certain purposes, it is equally plain that "these rudimentary or atrophied organs are imperfect and useless." [4]

(2.) Darwinists hold and teach that disused and useless organs must and do atrophy and waste away. Huxley, as quoted above, says that evolutionists in general assume this position.

(3.) It follows, therefore, that every disused and useless

(1) *Critiques and Addresses*, pp. 274-5.
(2) *Life and Letters*, Vol. 2, pp 299-300.
(3) *Evolution* &c., pp. 182.
(4) *Origin of Species*, p. 393.

organ must disappear. This too is affirmed by Darwinists, many of whom, as shown above, speak of the obliteration and disappearance of the so-called rudimentary organs as a matter of course. As we have shown, Darwin uses the word "obliteration"; Hæckel's phrase is "on the road to complete disappearance"; Huxley says, "ought to have disappeared"; and Le Conte speaks of the rudimentary organs as "passing away entirely."

It may be claimed, as in accordance with these views and representations, that rudimentary organs may have a *temporary* existence. Doubtless some of the Darwinists, if questioned, would be ready to answer that natural selection has not had sufficient time to do its work upon the surviving rudiments, but that it will obliterate them in the coming ages.

This plea of want of time will not do. In the human body it is claimed that there are seventy vestigial or rudimentary structures. Man is described as an old curiosity shop, a museum of obsolete anatomies, discarded, outgrown and aborted. [1] Some of these disused and useless organs, if indeed they are what they are claimed to be, must be of great antiquity. Take, as an example, mammæ in men. There is no species of mammals in which the male suckles the young. If the mammæ in men, therefore, are rudimentary and useless, they must have been in this condition during an exceedingly long period. Just as Huxley says, the mammary gland, if now rudimentary and useless in living men, must have been so in the remotest male ancestor of man. [2] Still farther; if the gill-slits in human creatures are, as claimed, rudimentary, they point to a time when the ancestors of men lived in the sea, and must have endured from that period to the present. Indeed Prof. Drummond says that prominent among the vestigial structures found in the human body are those "which smack of the sea." [3] Thus the origin of these structures ante-dates the time when the aquatic ancestors of man first came out on land. During the immense period that has elapsed since that event took place—100,000 years, 500,000 years, a million of years, many millions of years—these rudimentary organs have persisted in a disused, useless and atrophied condition. And still they have

(1) *Drummond's Ascent of Man*, pp. 83, 97.
(2) *Critiques and Addresses*, p. 275.
(3) *Ascent of Man*, p. 83.

not yet disappeared, and zealous Darwinists are constrained to ask for more time in order to allow natural selection an opportunity to obliterate them. No wonder that Huxley exclaimed, in reference to such facts, "They place us in a dilemma."

For these reasons we have said that, according to Darwinism, there are no rudimentary organs, and there can be none. The organs claimed as such, if disused and useless, would have disappeared long ago. Since they have not disappeared, they are neither disused nor useless, and are therefore not rudimentary.

It is thus shown that the existence of rudimentary organs in men, whales, serpents, monkeys and other animals, is, according to Darwinism, an impossibility.

III. Another impossibility involved in Darwinism is *the derivation of terrestrial animals from aquatic animals.*

Darwin indeed suggests that whales are metamorphosed bears; and it is claimed that porpoises as well as whales have descended from terrestrial quadrupeds. But the Darwinian doctrine is that land animals in general, including man, have descended from aquatic animals.

But common sense shows that the metamorphosis of water animals into land animals could not be effected in the Darwinian way, even granting (what is impossible) that slight modifications and incipient organs could be useful from the first; or, supposing (what is again impossible) that the water animals had organs to begin with, which by *further* development would fit them for the land. For these modifications, incipient organs, or pretty well developed organs, if fitting their possessors for the land, could not be useful to them as aquatic animals. Darwinism does not allow natural selection to preserve any modification or to develope or improve any organ with a view to *future* usefulness. It has no foresight or design. It works only for the preservation and improvement of modifications and organs that are advantageous to their possessors at present, and in their present environment. A fish, while it stays in the water, cannot acquire legs and lungs, and if it comes out on the land it will die. It can not survive long enough out of the water for its fins even to begin to grow into legs and its swim-bladder into lungs. As long as it remains a fish, it must stay in the water, and as long as it stays in the water, natural selection will make war upon all modifications of its form and structure that would unfit

it for its present environment. A fish, therefore, must remain if not a fish, at least an aquatic animal forever. Natural selection will not allow it to take on the form and structure of a land animal while inhabiting the water, and it cannot live more than a few minutes on land.

Spencer undertakes to show that a fish might indeed become a land animal. He evidently felt the force of Von Baer's ridicule, yet he gravely affirms that some fish "do take a walk" and "ramble about on land," and that one kind of fish *climbs trees*. The fishes, to which Spencer thus alludes, are crabs, gasteropods and lobsters. The tree-climbing-fish is a kind of lobster found in the Mauritius. [1] The fishes that thus go promenading occasionally over the land or that climb trees are simply amphibians. The impossibility of a real fish or other genuine water animal becoming an amphibian is just as clear as of its becoming a land reptile, quadruped or biped. Some amphibious land animals take strolls through the water. There is one kind of toad that can and actually does live *on trees* and also in the water. But the difficulty which confronts Spencer, and which he does not meet, is this: How, according to Darwinism, could well organized fishes, the most advanced of their species, acquire or develop organs which were entirely useless, if not a positive hindrance, to them, and which could be of use to them only in case they should cease to be fishes and come out on land. Spencer produces nothing to remove the absurdity of the conception of well developed fishes, while using their gills only in breathing water and their fins only in swimming, converting their gills into lungs and their fins into legs and thus preparing the way for their future offspring to forsake the water and pasture in the meadows.

Prof. Drummond has an off-hand way of accounting for the transmutation of man from a water animal into a land animal. According to his view, man made the change as easily as a boy learns to whistle. His account is as follows:

"When man left the water—or what was to develop into man—he took very much more ashore with him than a shell. Instead of crawling ashore at the worm stage, he remained in the water until he evolved into something like a fish; so that when, after an amphibian interlude, he final-

(1) *Biology*, Vol. 1, pp. 392-4.

ly left it, many ancient and fish-like characters remained in his body to tell the tale." [1]

This statement, like much else that has been written on the same subject, sets common sense and logic at defiance. Man, we are told, while being something like a fish, living in the water and breathing only water, became an amphibian. But how could he acquire or develop amphibious organs while living wholly in the water and breathing only water, as he must have done before he became an amphibian? Natural selection would develop, and in fact *tolerate*, only such modifications and organs as would be of advantage to him as a water-breathing animal. Hence natural selection would forever keep him a water animal and a water-breathing animal by barring the way to his becoming an amphibian. If while "something like a fish," he had any organs that would be useful to him on land, natural selection would make war on them and suppress them. But how easily Prof. Drummond slips over these and other difficulties! He is, however, by no means singular in doing so.

It is perhaps conceivable that according to Darwinism a land animal should become a water animal. For land animals can wade and swim in the water, and thus, according to the principles of Darwinism, a gradual modification of form and structure might possibly begin. We do not maintain that the metamorphosis of bears into whales, in the way supposed and described by Darwin, is self-contradictory or absurdly impossible; but we do say this in regard to the metamorphosis of whales into bears or into any other kind of land animal. For if a whale comes out on land (becomes stranded), it has no power of locomotion, and must soon die. In order to live, air-breathing though it be, it must remain in or on the water; and whatever changes it may experience through the struggle for existence and natural selection, these changes will only be such as are useful to it in its present environment. Natural selection therefore could not tend to transmute it into a bear or any other land animal.

Nor could the flying-fish ever be changed by natural selection into bird, reptile or other land animal. Its remaining in the water nearly all the time; its using its fins almost constantly in swimming, and its constant use of its

(1) *Ascent of Man*, p. 85.

water-breathing apparatus, must tend much more strongly to keep up its piscine form, structure and habits than can its jumping occasionally up into the air for a few seconds tend to transform it into an animal of the air or land.

But most of the aquatic animals never leap into the air and never come out on land. And the effect of natural selection, even in these few exceptional cases, must be to perpetuate aquatic forms, structures and habits. Natural selection itself must forever prevent the transmutation of aquatic animals into land animals.

IV. Another impossibility in Darwinism is *the increase of the number of species.*

We maintain that, according to Darwinism, there ought to have been and must have been, for many ages preceding our own, not an increase, but *a large decrease in the number of species.*

We have already shown [1] that the Darwinian doctrine is that but few species change, and that transmutation is exceptional. We again call attention to the declaration of Darwin already quoted in our chapter on the invariability of species, as follows: "And of the species now living very few will transmit progeny of any kind to a far distant futurity; for the manner in which all organic beings are grouped shows that the greater number of species of each genus, and all the species of many genera, have no descendants, but have become utterly extinct." [2] We have also quoted the express words of Huxley, declaring that the ascertained facts of palæontology "negative the common doctrines of progressive modification," and that persistency of type prevails everywhere among all the genera and species of all the four classes of animals except the higher vertebrates. [3] We have shown that Spencer affirms that even this appearance of slight modification "may be, and probably is, mainly illusive," and may "indicate nothing more than successive migrations from pre-existing continents." [3] We have laid before our readers the emphatic declarations of Le Conte, that "*most species become rigid and either remain unchanged, almost indefinitely, or else die out and leave no descendants; and that only the more plastic forms change into other species.*"

Now, according to these views, the increase of species

(1) Chap. 3.
(2) *Origin of Species*, p. 423.
(3) Chap. 3.

is impossible. The final result must be the absolute extinction of species. Even if Darwin's four or five, or his one primordial form, had in some way gotten a start in propagation and increase, the law that only a very few species (to use Darwin's words) shall transmit progeny to a distant future, and that the greater number shall become utterly extinct, will ultimately reduce them to their original small number and exterminate them altogether.

It appears that Le Conte alone perceived this difficulty. In order to meet it, he supposes that the few more plastic species that are changed into other species, are changed usually each into *several* species, that "thus the number of forms may be undiminished." [1] But the only evidence or argument in favor of this hypothesis is the fact that it is needed to help out Darwinism. It, however, is after all inadequate to remove the difficulty. For according to Darwinian views, as above presented, only a *few* species change, and the *many* become extinct. Le Conte's hypothesis, therefore, needs amendment by expansion. While he was at it he might as well have supposed that one species is transmuted into *many* as into *several* other species; rather better in fact, for the former hypothesis is what Darwinism needs, and there is just as much evidence for the one as for the other; that is, none at all. The very fact that there is need of such an hypothesis and the recognition of the fact by so able a man as Le Conte demonstrate that we have here one of the impossibilities of Darwinism.

V. Another of the impossibilities involved in Darwinism is *the origin of species, by natural selection, in a state of nature.*

Let it be observed that we are not now affirming that species could not possibly originate in a state of nature, but only that, *in a state of nature*, species could not originate *in the way suggested by Darwinism.*

Artificial selection does indeed produce varieties or breeds. But these are the result of design and care. The breeder brings together chosen males and females by pairs in order that peculiarities may be reproduced and increased in their offspring. But in a state of nature, the pairing of males and females is not brought about with a view to securing peculiarities in the offspring; supervision and

(1) *Evolution and its Relation to Religious Thoughts*, pp. 266 7.

care are absent. To be sure the phrase *natural selection* implies that nature chooses. But the phrase is figurative; nature is not a person, and Darwinism excludes all care, design and foresight in natural selection. But these are essential factors in artificial selection. Even after varieties have been produced, these begin to revert back to the original type whenever the care and efforts of the cultivator are withdrawn. Such reversion has to be carefully guarded against by fanciers and cultivators. They must select individuals whose pairing is likely to transmit and increase certain peculiarities, and this selective pairing must be carefully attended to, generation after generation. Even one unsuitable pairing will in a great measure or altogether destroy what has been gained by selective breeding and careful cultivation. Yet with all the care, foresight and efforts of breeders and fanciers; though maintained for thousands of years, the results are not new species, but only varieties. And when human care and effort are withdrawn, and intercrossing is allowed to take place, reversion to the original type inevitably takes place. Indeed free intercrossing must be prevented in order that a well defined variety may be produced and maintained.

It is evident, then, that intercrossing must be prevented in order that species may be produced in the Darwinian way. Darwin admits that free inter-crossing will wholly stop the work of the selective breeder, [1] and hence he declares that "isolation is an important element in the process of natural selection," and that "isolation is of considerable importance in the production of new species." [2] He even declares that "isolation appears the chief element in the production of new forms." [3] But Romanes was not satisfied with any of these admissions, as is shown by the following declaration: "Although Darwin in his latter years came to recognize more fully the swamping effect of free intercrossing, it is evident that he never worked out any of these matters." Romanes expressed his own belief by saying that "in the case of *polytypic* evolution, such evolution, by natural selection alone is absolutely impossible." [4] He also puts in capital letters, among his general conclusions, the declaration that, "*Without isolation or the prevention of free intercrossing, organic evolution is in no case*

(1) *Origin of Species*, p. 96. (2) pp. 97, 98.
(3) *Life and Letters*, Vol. 2, p. 28.
(4) *Darwin and after Darwin*, Vol 3, p. 108.

possible." [1] Hence Romanes admits that there are two "fatal difficulties" connected with natural selection as advocated by Darwin; the one being the contrast between natural species and domesticated varieties in respect to cross-sterility, and the other "the swamping effects of free crossing." [2] Hence he introduces the hypothesis of *physiological* selection. Le Conte also notices this "swamping" business, and says: "This difficulty has been severely felt by all Darwinists." [3] The difficulty thus referred to is the fact that the individuals of each species breed together, and as long as they do so, divergences and peculiarities will be, as it were, absorbed, and thus the formation of new species will be prevented. Darwin claimed that geographical isolation would prevent the swamping effects of intercrossing. Romanes and Le Conte, on the contrary, however, suggest and maintain that physiological selection, by which they mean *sterility of varieties* with one another, is just the thing that is needed as an additional agent in the production of new forms.

We claim, however, that this whole hypothesis of the prevention of the free intercrossing of animals of the same species, in a state of nature, by isolation and physiological selection, is contrary to observation, logic and common sense. "Without outlet for migration (says Le Conte) commencing varieties could not pass into species, because swamped by cross-breeding." [4] Certainly migration is conceivable as a means of isolation. But *how* can a commencing variety or a commencing species be isolated by immigration? The individuals that constitute the commencing variety or the commencing species will not go off by themselves and form a separate herd or flock. To suppose such a thing is absurd. This is not the way either men, beasts or birds migrate. No one ever saw bandy-legged sheep, like Seth Wright's ram, leave the rest of the flock and go off by themselves. The stump-tailed bulls and cows do not secede from the rest of the herd. The Dominica hens never demand to have a poultry yard all to themselves. Such divisions as these never take place among the lower animals. The writer has fed sheep, swine, cows, horses, dogs, cats, chickens, turkeys, ducks,

(1) *Darwin and after Darwin*, Vol. 3, p. 145.
(2) Vol 3, p. 41.
(3) *Evolution, etc.*, pp. 76, 77.
(4) *Evolution* etc., p. 77.

and guinea-fowls, and has a life-long acquaintance with most of the domestic animals, and, in his judgment, such isolation as is referred to above is a preposterous idea. Animals may indeed migrate, and in doing so may separate; but in all such cases the separation will not be according to peculiarities of color, form or structure. Each company or group will embrace all peculiarities.

As to physiological selection, which is selective infertility, advocated by Romanes and Le Conte, we remark, as follows:

1. This hypothesis is *not proved*. Some individuals of the same species are indeed infertile with one another. But some individuals of every species are absolutely infertile. But these are exceptional cases, and their cause is unknown. Those individuals of the same species that are infertile with one another, do not differ from one another more than do other individuals of the same species. Nor do they exhibit nascent peculiarities suggestive of new species. That these cases of infertility have anything to do with the origination of new species is nothing but a supposition.

2. This hypothesis of selective infertility is not accepted by many evolutionists.

3. The necessity for this hypothesis is the admitted fact of the impossibility of the origin of new species in the way indicated by Darwin.

4. It is quite evident that the proof of this hypothesis, as well as the necessity for it, is the fact that Darwinism, as taught by Darwin, has to be recognized as a failure. Romanes begins his discussion of "physiological selection" by declaring that "there are two fatal difficulties against natural selection as a sufficient explanation of the origin of species."[1] Le Conte too admits these difficulties, and says of one of them that it has been "*severely felt by all Darwinists*."[2] Hence the hypothesis of isolation by selective infertility.

Thus we have clear evidence that "the swamping effects of free intercrossing" in a state of nature would render impossible the production of new species in the way proposed by Darwinism, as taught by Darwin. As we have showed, this is admitted by Romanes and Le Conte, who endeavor to remove the difficulty by proposing amend-

(1) *Darwin and after Darwin*, vol. 3, p. 41.
(2) *Evolution*, &c., p. 76-7.

ments to Darwinism, which, however, most other Darwinists do not accept. The very reason assigned by these two distinguished advocates of evolution for the introduction of their supplementary hypothesis of "physiological selection," is the admitted fact that in a state of nature, according to Darwinism, as taught by Darwin, the production of new species by natural selection is an impossibility.

VI. *The cell-making instinct and skill of the hive-bee* is another of the Darwinian impossibilities.

The exquisite beauty of the honey-comb and ingenuity of its structure are universally recognized and admired. The bees are correctly said to have solved a difficult mathematical problem in constructing cells in such a way as to secure the greatest strength and capacity with the smallest expenditure of material. The bottom of each cell rests on three partitions of cells on the opposite side of the comb; and the partitions between the opposing cells are composed of rhomboidal planes united at the centre. By actual measurement, Miraldi showed that the angles formed by the inclination of these planes are 109° 28′ and 70° 32′, *precisely* the angles which secure the greatest strength and storage capacity with the least work and least expenditure of material. But, according to the calculation of Koenig, the angles should be 109° 26′ and 70° 34′; and for some time the discrepancy was explained by the supposition that either the bees make a mistake in fixing the angles of the rhomboidal planes, or that there had been a mistake made in the measurement of them. But Lord Brougham, not satisfied with this explanation, applied himself to a fresh investigation of the question, and succeeded in showing that, owing to the neglect of certain small quantities, the result previously obtained was erroneous to the exact amount of two minutes, the precise extent of the discrepancy between the calculation of the mathematicians and the angles constructed by the bees. Thus it was demonstrated that the bees all the time were right, and the mathematicians wrong.[1]

Thus it is shown that the bees manifest more than human skill and accuracy. They solved a difficult mathematical problem, in attempting which skilled mathematicians blundered. Without tools and in the dark, they form structures which for beauty, precision and adapta-

(1) Brougham's *Supplement to Paley's Nat. Theology*, p. 51. Carpenter's *Human Physiology*, p. 643.

tion can scarcely be equalled by the most experienced and skillful artisans, with all their tools and appliances.

All the bees in the hive, i. e. all the working-bees, work together, yet each one works according to its own will or instinct; for it may be said of the bee, as of the ant in the book of Proverbs, "which having no guide, overseer or ruler, provideth her meat in the summer and gathereth her food in the harvest."[1] The queen is not a ruler, but a mere breeder. All the working bees must therefore, have the same instinct and will. For, the world over, all the combs are constructed in the same way, and with the same skill and precision. They never disagree, nor make mistakes. Yet the working bees, whose ingenuity, skill and achievements are so admirable, learn nothing from practice and experience, but act from instinct or native genius. They live never more than a few months, and only six or seven weeks in the working season. They cannot inherit their skill and working instinct; for they are the offspring of the queen and a drone, which do no work, and which therefore have neither skill nor the working instinct. The working-bees, though denominated neuters, in case there is no queen, produce offspring, but they are drones. Hence the skill and working instinct of the bees cannot be inherited nor be the result of habit. We hold that these facts, viewed in the light of logic and common sense, very clearly indicate that the working bee, with its exquisite skill and its instinct and habit of industry, cannot have originated in the Darwinian way.

Darwin took in hand this cell-making instinct of the bee and tried to account for it by natural selection. His effort was simply to show its origin in this way to be *possible*. He succeeded in showing how he himself came to believe in such an origin as possible. His argumentation demonstrates the fact that he chose thus to believe simply because otherwise he would have been compelled to give up his favorite hypothesis of natural selection.

Let us recall the main point in this section. The working bees cannot inherit their industrial instinct and artistic skill from their parents, the queen and the drones, because these cannot transmit that of which they are entirely destitute.

VII. Another impossibility involved in Darwinism is the *determination of the number of fingers on the human*

(1) *Prov.* 6:7-8.

hand by natural selection. The normal number is five. But there are examples of six-fingered men, Then how has the normal number been determined? Why have people in general just five fingers, no more and no fewer on each hand? The Darwinists are bound to maintain that this matter was determined by natural selection and the survival of the fittest. But what does this imply? It implies that people with more or fewer than five fingers on each hand were not in harmony with their environment, labored under a disadvantage in the struggle for existence, and so were eliminated. It implies that six-fingered people were handicapped with the super-numerary digit, were less vigorous than five-fingered people, did not live so long, and had fewer and less healthful children. Thus the six-fingered people were crowded out and finally disappeared. But this is absurd. It is impossible that the sixth finger should exert so disastrous an influence. This, then, is another of the impossibilities of Darwinism.

VIII. Still another is the *determination of the number of toes by natural selection.* Most quadrupeds that have toes have five on each foot both before and behind. But one species has five toes to each fore foot and four to each hind foot. Several species have four toes to the fore feet and five to the hind feet. Some have four toes to each foot both before and behind. There are other variations.[1] To say that the number of toes is fixed by natural selection is absurd. The attempt to account for the number of toes possessed by each species, five before and five behind, in some cases, five before and *four* behind, four before and five behind, four both before and behind, and so on, by the principle of natural selection, and the weeding out and destruction of all that had not the proper number, leads only to contradiction and absurdity. The impossibility of such a process is self-evident. But the conception of the world as created and managed by an intellectual and moral Being with a special view to the development and welfare of the human race, and of the complex system of variety in uniformity as well adapted to this purpose,—the conception, we say, of a Divinity in the world, thus shaping and arranging things for the entertainment and improvement of the human mind, the greatest thing in this lower world, by the harmonious blending of variety in uniformity and

(1) Agassiz, *Essay on Classification*, p. 44.

of invariability with constant change, involves neither absurdity nor impossibility. It matters little that we cannot see in all cases the secondary causes by which God accomplishes his wise and benevolent purposes.

IX. Another impossibility is the *production of variety and peculiarities of colors through natural selection.* We do not by any means say that *all* the claims of Darwinists in the matter of color are in themselves unreasonable and impossible. It is certainly conceivable that dark-colored animals would be at a disadvantage among perpetual snows, and hence that they died out in time, leaving the snowy regions exclusively to white animals. Nor is it in itself incredible that the brown color of rabbits, that live in the brush, should have originated in a similar way. We might indeed object that, according to this Darwinian mode of accounting for the color of animals, jack-rabbits that live among the prairie grass, and birds that live in the forests, ought to be green, at least in the summer time. But color among plants and animals is a matter of minute facts, and by these the possibility of Darwinism is to be determined. Its theory of color may seem possible and plausible when considered in a general and loose sort of way; but when applied to particulars, its absurdity and impossibility at once begin to appear. For example, how could natural selection produce the short, white tail of the rabbit? Indeed the rabbit's tail, as a rudimentary and useless organ, ought, according to Darwinism, to have disappeared long ago. It was the bounden duty of natural selection, instead of furnishing the rabbits with little white tails, to have made them without tails at all. Perhaps some Darwinist is disposed to fall back on sexual selection, and to insist that the cotton tail with its graceful curl is of use to the male as an attraction, in courting time, to gain the admiration and favor of the female. But both males and females have the same kind of tail. Besides, they all make their tails most conspicuous when they are running away from their enemies. The notion of the production of the white tails of rabbits, through natural selection, implies the killing off of all the rabbits with brown or black tails, or with tails different from those now fashionable among brown rabbits.

Again, natural selection could not produce the peculiarities of color among birds. We select the woodpecker as an example. How is the color of its head to be ac-

counted for? Why is its head, and no other part, red? To be sure, a red head may be regarded as "a thing of beauty and joy for ever," at least among woodpeckers, and hence useful to the male in pairing time. But the female woodpeckers have red heads as well as the males. The color of the head is, therefore, not to be attributed to sexual selection. Nor is this peculiarity of any conceivable benefit to its possessor. If the head of the woodpecker were white like its breast, or black like its wings, it would be just as strong and healthful and just as successful in catching worms and insects.

Darwinism fails also to account for the brilliant and beautiful colors of the peacock. The hypothesis of Darwin is that these are the results of sexual selection, which amounts to this: that the ancient peahens admired and favored peacocks with long and variegated tails. Hence the peacocks the least gifted in this respect were compelled to live bachelors and to die without posterity. The result was a wonderful increase in the size and variegation of the peacock's tail. The facts indicate a remarkable æsthetic taste and appreciation on the part of the ancient peahens. As Darwin says, the oval disc or ocellus is certainly one of the most beautiful objects in the world, consisting of "an iridescent, intensely blue indented center, surrounded by a rich green zone, this by a broad coppery-brown zone, and this by five other narrow zones of slightly different iridescent shades." Now, if the Darwinian hypothesis is true, the ancient peahens must have recognized and admired these many different-colored zones and different iridescent shades. What wonderful eyes those ancient peahens must have had, and what an appreciation of different colors and shades, as brought to view in Darwin's account of the evolution of peafowls from pheasants or some similar species of birds! Speaking of the superior beauty of tail-coverts ornamented with double ocelli, he says: "Many female progenitors of the peacock must, during a long line of descent, have appreciated this superiority."[1] Of this account of the evolution of peafowls, Ruskin wrote as follows: "I am informed only that peacocks have grown to be peacocks out of brown pheasants because the young feminine brown pheasants like fine feathers. Whereupon I say to myself, Then either there was a distinct species of brown pheasants born with re-

(1) *The Descent of Man*, pp. 430, 434.

markable eyes in their heads,—which would be a much more wonderful distinction of species than being born with remarkable eyes in their tails,—or else all pheasants would have been peacocks by this time! And I trouble myself no more about the Darwinian theory."[1]

We will show farther on that the peacocks' tail gave Darwin a great deal of trouble. The source of the trouble was the difficulty of accounting for the origin of the peacock's tail either by natural or sexual selection. The anxiety and annoyance which Darwin experienced from this source are demonstrated by the fact that he himself declared that the very sight of a feather in a peacock's tail made him sick.[2] There are perhaps others who, if they had the insight and logic of Darwin, would feel very badly whenever they should see or think of a peacock's tail.

The above facts are presented as illustrations of the impossibilities involved in Darwinism. Many other similar illustrations might be given. The essence of the Darwin hypothesis is natural selection, and the main idea in natural selection is that it kills off and thus eliminates the individuals and species that are destitute of the modifications, peculiarities and characteristics which it favors. It succeeds only by destroying. It is powerless to produce or to promote any thing that is not necessary or useful in the struggle for existence. Whatever, therefore, is attributable to natural selection as its cause, whether a peculiarity of form, size, color, structure, organ, muscle, bone, sinew, teeth, eyes, ears, limbs, fingers, toes, and everything else, must be considered as having been necessary to their po ssessors in so high a degree that without them continued existence was impossible.

Thus it it demonstrated that the possibilities of natural selection are very limited and its impossibilities absolutely countless. Countless facts pertaining to form, size, color, structure, organs, instincts and habits among animals; countless facts in regard to peculiarities among plants; their flowers with petals, sepals, stamens, pistils, tints, spots, stripes, shadings, and endless variations; their leaves, saw-toothed, dentate, scalloped, sinuate, jagged, one-lobed, two-lobed, three-lobed, many-lobed, veined,

(1) *The Eagle's Nest, or Ten Lectures, before Oxford University*, p. 156.

(2) See next chapter, and also Darwin's Life and Letters, vol. 2, pp. 7, 90.

feather-veined, radiate-veined, palmate-veined, etc., etc.,—all these and countless other variations and peculiarities are not only inexplicable, but impossible on the Darwnian hypothesis.

CHAPTER IX.

DARWINIAN ARGUMENTS CONSIDERED.

Many of the arguments, which Darwinians are accustomed to employ in support of their hypothesis have already been considered, and in whole or in part answered. Hence in regard to some of these arguments nothing, or at most, little need now be said.

I. *The palæontological argument.*

This argument might better be called *geological*; for all the ancient facts employed in its construction are derived from the science of geology. Darwinists appeal to this science for proof of their claim that there has been a regular gradation in the order of vital existences. But the opponents of Darwinism also appeal to geology to prove several points of the greatest argumentative importance, such as the sudden and abrupt appearance of species, the non-existence of half-formed species, or intermediate forms as connecting links between preceding and succeeding species, and the co-existence of the most highly organized types (as Vertebrates) with the lowest types (as Radiates) in the earlier geological ages and in the lower fossiliferous strata. The proofs of these points, fatal (if proved) to the Darwinian hypothesis, and the admissions of them by Darwinists, have been presented in our 5th chapter. The Darwinists, at least many of them, seem to regard the palæontological facts, which geology sets forth, as adverse to their views. For, almost their whole argumentation on the subject consists in attempts to prove, or rather in assertions of, great imperfection in the geological record. They virtually declare the geological record untrustworthy in order to get rid of its testimony against them. All this, together with the damaging admissions of Le Conte, Dana and others in regard to sudden and paroxysmal operations and changes, is treated of in the chapter above named, to

which we refer the reader. [1]

II. *The argument drawn from rudimentary organs.*

This argument we have discussed in our 8th chapter. We there have showed that, according to the principles of Darwinism and the admissions of some of the ablest of the Darwinists, there can not either be nascent or atrophied organs.

Natural selection, we are told, preserves and promotes only what is advantageous to its possessor, and makes war upon everything that is injurious, and even upon everything that is useless to its possessor, as being a waste of material and a hindrance. But a mere modification, or a budding organ, one just commencing in a rising or protuberance, cannot be useful or advantageous to its possessor. Therefore natural selection will operate against it and eliminate it. Indeed, according to Darwinism, a nascent organ can never get even a start. Those four or five primordial forms or one, of which Darwin speaks, could never acquire an additional organ.

So too in regard to disused and useless organs. Since they are useless to their possessors, it is claimed natural selection atrophies and dwarfs them. But the process must go further. These useless organs must be obliterated, for which due time must of course be allowed. But as man and earth's present fauna, according to the showing of Darwinism, have existed for hundreds of thousands of years, all rudimentary organs must long ago have been obliterated and destroyed. Thus both nascent and atrophied organs are alike impossible, according to Darwinism. See chapter 8th as mentioned above. [2]

III. *Natural malformations and monstrosities.*

These matters are discussed in chapter 6th.

IV. *The morphological argument.*

The basis of this argument is the similarity in the structure of organic forms of different species. It is assumed that the various kinds of animals would not have been similarly constructed if they had not been descended from the same ancestors. The idea of the Darwinist is that similarity of structure is explained by common descent, and that it can be explained in no other way. Darwin says:

"What can be more curious than that the hand of a man

(1) Chap. 5. (2) pp. 333-336.

formed for grasping; that of a mole for digging, the leg of a horse, the paddle of a porpoise, and the wing of the bat, should all be constructed on the same pattern?" Next the author declares that nothing can be more hopeless than the attempt to explain this similarity of pattern by utility, or the doctrine of final causes. Then he affirms that the explanation is manifest on the theory of natural selection of successive slight modifications. [1]

This example of homology is doubtless as good as can be selected. Is the reasoning founded upon it conclusive?

The similarity claimed we admit. We do not indeed see much similarity between the *hand* of a man and the *leg* of a horse, though there certainly is between the *arm* of a man and the *leg* of a horse. We do not see much similarity between the *hand* of a mole and the *leg* of a horse, though there may be between the former and the *hoof* of a horse. Though, therefore, the statement of Darwin above quoted is not marked by his usual accuracy, we admit the similarities claimed as existing between the organs of animals of different species. We claim, however, that these similarities may be accounted for on the principle of adaptation and design. Though the hand of the mole is constructed on the same pattern with the human hand, the hoof of the horse and the paddle of a porpoise, it is perfectly adapted to the business of digging and scraping dirt. The human arm is none the less useful because it is constructed like the fore-leg of a horse and the wing of a bird. The usefulness of none of the homologous organs would be increased by a difference in construction. They are constructed alike, and ought to be constructed alike, because they are to be used in similar or analogous ways. The radius and ulna in the fore-leg of a horse and the arm of a man contribute in both cases to facility of motion and to strength. The same is true of the wing of the bat and the paddle of the porpoise, and of all other homologous organs. The handles of many different instruments are very much alike, for instance, the hoe, the hand-rake and the hay-fork. The handles of these implements are made as they are, simply with a view to their usefulness; but the result is similarity. Their possession of common qualities is no evidence that these qualities are inherited from a common ancestor; or that they resulted from a desire of the makers to have handles look alike; or that they were produced

(1) *Origin of Species*, pp. 377-8.

through some blind principle or law operating without design. If the handles in question were constructed differently, they would be less convenient and useful.

Our further and main reply to Darwin's morphological argument is this, that according to his own hypothesis *nothing useless can permanently exist in any organic structure.*

We have heretofore shown that natural selection promotes and indeed tolerates only what is advantageous and that it makes war upon and eliminates whatever is disadvantageous or useless. A useless organ, or a useless part, is a hindrance and a waste of material besides, and therefore cannot endure; in fact could never come into existence. According, therefore, to Darwinism, every organ, and every part of every organ, in all animal structures is useful. When Darwin, therefore, maintains that there are in various animals organs, or parts of organs, that cannot be accounted for on the ground of utility, and must be accounted for on the hypothesis of inheritance, he turns against his own avowed beliefs and principles.

As an example of uselessness in organic structures, he refers to the skull, and says:

"Why should the brain be enclosed in a box composed of such numerous and such extraordinary shaped pieces of bone? As Owen has remarked, the benefit derived from the yielding of the several pieces. in the act of parturition of mammals, will by no means explain the construction in the skulls of birds." [1]

The main point, then, in Darwin's argument is the assumption that there are useless bones in the skulls of birds. We reply as follows:

1. According to Darwin's own teaching there ought to be no useless bones in the skulls of birds or of any other animals. If there ever had been, natural selection would long ago have obliterated them.

2. Darwin admits that the peculiar construction of the skulls of vertebrates facilitates parturition. He might even have said that it is *essential* to parturition, at least in many cases. For were it not for the yielding of the skull, parturition would perhaps, in a majority of cases, be impossible and in all cases would be extremely painful and dangerous. Darwin offers, as an offset to this fact, the plea that the explanation does not apply to birds, since they are not

(1) *Origin of Species*, p. 379 380.

born but hatched. But hatching is analogous to parturition. The birth of the bird is consummated when the growing chick bursts the egg-shell. This bursting of the shell is preceded by compression of the body of the chick, but especially of the head. The first chipping of the shell is accomplished by pecking, which requires a movement of the head backward and forward. Hence the necessity for compressibility in the head of the chick in hatching, as well as in the head of the fœtus in partuition. This compressibility is secured in both mammals and birds by the division of the skull into several parts. Thus is accounted for the construction of the skulls of both classes of animals on the same pattern.

3. The construction of the skulls of vertebrates (both mammals and birds) out of many pieces of bone is advantageous not only in parturition and hatching, but afterward. This fact is most evident in the case of human beings. The infant skull, which contracts by compression in parturition, afterward expands in accordance with the natural growth of the brain. It also gives room for inflamation, to which young children are liable, especially in time of dentition. But when the critical period of childhood has passed, and the brain has become well developed, the fontanelle hardens and the sutures close, so that the skull becomes almost solid bone by the union of its pieces. What is here said of the skulls of human beings applies to those of other vertebrates, though in a less marked degree. All this indicates foresight and design rather than the unintentional result of the operation of a mere blind and thoughtless abstraction, like natural selection.

Let it be noted, too, that the formation of a compressible skull, of many bony pieces, in the womb, before the compressibility of the skull can be of any utility, is contrary to Darwinism, which teaches that natural selection never anticipates future wants, but fits organisms only for their present environment.

4. Darwin and his followers in this argument presume too much on human ignorance as a disproof of facts. They assume the uselessness of certain organs or parts of organs in the bodies of men and other animals, on the ground that their particular use is not perceived. They find certain bones in a man's head or in the fore-leg of a horse, which they decide in their own minds have no visible use and hence need an apology for their existence. The as-

sumption of uselessness in such cases is based simply on ignorance. Because they do not know what is the utility of some bone, or some part of a bone, or of the division of a bone into several pieces, they conclude that there is no utility in the case. Thus they make human knowledge the test of truth and assume too that what they do not now know never can be known. It is thus they reason when they conclude that because the particular use of an organ or structure is not known, therefore it is useless. The impropriety of such reasoning has been recognized by some of the ablest Darwinists. Prof. Romanes says:

"Our inability to detect the use of any given structure or instinct is no proof that such a structure or instinct is actually useless, seeing that it may very probably possess some function hitherto undetected or possibly undetectable." [1]

The assumption that an organ or structure is useless on the ground that its particular use has not been detected is especially inexcusable on the part of Darwinists, inasmuch as their main hypothesis involves the conclusion that no useless organ or structure can permanently exist.

5. Lastly, Darwin in this argument neither explains nor removes the difficulty, but merely pushes it farther back. He thinks it useless for men to carry so many pieces of bone in their heads. He therefore accounts for the phenomenon by supposing that these bones have been entailed on men by inheritance from ancient and beastly ancestors. But how did these ancestors get these supernumerary bones? We have been abundantly taught that natural selection never does anything needlessly, and preserves and increases only the necessary and the useful. If the pieces of bone in question are out of place and useless in a man's head, they could not be proper in the head of a tiger, kangaroo, monkey, or other beast. In fact, these bones, if useless, could not have been produced by natural selection. They must, therefore, have belonged to the four or five primordial forms or one primordial form, which Darwin supposes to have been the beginning of the organic world. But as God originated these by creation (such is the Darwinian hypothesis) they of course possessed no organs that were useless.

V. *Geographical Distribution.*

It is claimed that the facts which pertain to the dis-

(1) *Darwin and After Darwin*, vol. 2, p. 170.

tribution of plants and animals throughout the earth are inconsistent with the theory of centers of creation. These facts are as follows: the marked difference between the productions of countries that are alike in soil and climate, as for instance the New and Old Worlds; the differences between the species on different sides of barriers, such as large rivers and ranges of mountains; the great difference between the fishes on the western coast of Central America and those on the eastern coast, with only a narrow isthmus between them; the fact that there is not a single mammal common to Europe and South America; [1] the peculiarites of the faunas of Australia and New Zealand; the restriction of humming birds to America, not one of the 400 species being found in the Old World; and various other facts. [2]

These facts, it is claimed, indicate that the countries and lands have been supplied with plants and animals by migrations, and the conclusion is drawn that the theory of special creation is not true.

1. It however seems to us that the theory just mentioned is not incompatible with the geographical distribution of species or with any of the facts pertaining thereto. The theory of special creations involves the notion of centers of creation; and centers of creation imply migration. Probably no one is absurd enough to imagine a center of origin on each side of every wide river, every mountain-range, and every other barrier. Species do migrate and in migrating do often invade each others' ranges. No hypothesis inconsistent with these well known facts can be true. The very idea of centers of creation implies that plants and animals did not originate everywhere, but only at certain points, and that from these points migrations took place. In accordance, then, with this hypothesis of special creations, there must have been migrations, invasions by species of each others' ranges, similar species at great distances from one another, dissimilar species near one another and even mingled together, and all the phenomena which Darwinists adduce under the head of geographical distribution in favor of their hypothesis.

Even according to the Biblical account there was at one time a single great center. According to that account, there was at first but one human pair, and their place of

(1) Darwin, *Origin of Species*, pp. 302 9.
(2) Romanes' *Darwin and after Darwin*, vol. 1, pp. 205-213.

residence was the center for at least a large number of the lower animals. The Lord God brought the cattle, the fowls of the air and the beasts of the field to Adam and he named them. [1] We are not now quoting the sacred record as proof of facts, but merely as showing what the theory of special creations is. From Eden, then, as a center, both men and the lower animals, at least many of them, migrated. After the flood, the center was near Ararat, [2] and a little later in the land of Shinar. [3] If the flood was universal, here was the center for a time not only for the human race, but also for the land animals in general. If the flood was not universal, Shinar was the temporary center for at least a large portion of the lower animals as well as for men. From Babel the general dispersion took place, a dispersion indeed of men, but also of the animals connected with them. [4] Whatever the sceptic may think or say of the historical character of the Bible narrative, he cannot but admit that it suggests the dissemination of animal life by migrations and dispersions. Besides, as we have elsewhere suggested, probably only a single pair of each species of animals was at first created. That the lower animals were few in number at first is implied in the command given to the fishes and (aquatic) fowls: "Be fruitful and multiply and fill the waters and let fowl multiply in the earth." [5] This same first command was given to the original human pair: "Be fruitful and multiply and replenish the earth." [6] We infer, then, that as in the case of mankind, so also in the case of the lower animals, but a single pair of each species was at first created.

A geometrical increase of the single pairs would soon stock the earth with inhabitants. According to this view, all the phenomena of geographical distribution are just as well accounted for by the theory of special creations as by the Darwinian hypothesis.

2. There is one fact pretty generally admitted, which shows that it makes little difference, so far as the phenomena of geographical distribution are concerned, whether the theory of special creations, or the hypothesis of the origin of species by descent, be accepted, and that is *the fact of the glacial period*. In whatever way species may have originated, it is evident that the world must have

(1) *Gen.* 2:19-20. (2) *Gen.* 8:4. (3) *Gen.* 11:1-2.
(4) *Gen.* 11:8-10.
(5) *Gen.* 1:22. (6) *Gen.* 1-28.

been stocked with plants and animals mainly by dispersions and migrations after the glacial period. Darwin says that during this period Europe and North America suffered under an Arctic climate, and that thus the inhabitants of the arctic regions and also of the more temperate regions were forced to migrate southward. He affirms that there is evidence of glacial action south of the equator, even as far south as New Zealand. He affirms farther that "plants and animals, both in the Old and New Worlds, began slowly to migrate southwards as the climate became less warm, long before the commencement of the glacial period." [1] Both A. R. Wallace and Romanes hold that glacial epochs have several times over occurred in temperate lands and mild climates, and that the effects of such great and repeated changes on the migration, modification and extinction of species, must have been of overwhelming importance. [2]

Now common sense must decide that the effects of inincreasing cold and glaciation upon plants and animals would be the same, in whatever way they originated, whether by special creation or by natural selection. Even if animals proceeded from the ground, at God's fiat, in every continent, country, and island, still they would be compelled to migrate on the approach of the intense cold or to perish imbedded in ice like the extinct mammoths. Then on the return of a warmer temperature, the vacant regions would be supplied by a second migration. Thus all that is claimed for distribution and migration by the Darwinists might take place in accordance with the hypothesis of special and immediate creations.

3. If it is claimed that there are serious difficulties in reconciling some of the facts of distribution with the last mentioned theory, we reply that the same is true of natural selection, as has been fully admitted by Darwin himself, as follows: "Undoubtedly there are very many cases of extreme difficulty"—"The difficulties encountered are grave enough."—"I am far from supposing that all difficulties are removed."—"very many difficulties remain to be solved." —"I have said that many difficulties remain to be solved."—"A far more remarkable case of difficulty"—"I do not deny that there are many and great difficulties." [3]

(1) *Origin of Species*, pp. 319, 325
(2) Romanes, *Darwin and After Darwin* I, p. 207.
(3) *Origin of Species*, pp. 307, 331, 345, 400.

So far as Distribution as well as other points are concerned, Darwinism seems to be beset by as many difficulties as the theory of special creations, if not by more. Why is it that so many Darwinians appear to be completely oblivious of this fact?

VI. *Classification.* The argument drawn from this source seems to us to be very weak, and hence we shall spend but little time upon it. The argument, as we understand it, is this: that, if Darwinism, the theory of the origin of plants and animals by descent, is true, it would furnish a true and convenient principle of classification; therefore Darwinism is true. In reply, we say:

1st, that we have already a true and convenient principle of classification, viz., *resemblance.* We class together things that are alike.

2nd, The classification of Cuvier is still retained and is likely to be. Its author was not a Darwinian, and it was accepted by men who were not Darwinians. It was formed and accepted by men who believed in the theory of special creations; yet it is admitted to be a true, good and convenient classification. There is no pressing need for another.

VII. *The embryological argument.*

This argument, drawn from the similarity of the embryos of different animals, is analogical; and it is based on the principle that things that are known to be similar in some respects are likely to prove similar in others. Darwin and his followers reason thus: The embryos of men and other animals are similar, therefore men and other animals have the same origin and are descended from common ancestors. Or, the argument may be stated thus: The human, canine, equine, bovine and porcine embryos are all very much alike in their first stages of development, therefore men, dogs, horses, cows and swine are all descendants from a common parentage for back in the past.

The strength of the argument depends on the degree of similarity. A great deal has been said on this matter of embryological resemblances. It has been claimed that the human embryo in its development takes on at different times the form and likeness of the fish, reptile, bird and quadruped, so that men before their birth resemble in succession these several classes of animals. Emphasis is laid upon the fact that the human embryo cannot be distinguished at first from that of the dog or of any other ver-

tebrate. Hæckel tries to mortify the pride of aristocrats by reminding them that all human embryos, those of nobles as well as of commoners, during the first two months of development, are very much like "the tailed embryo of dogs and other mammals." [1] Hæckel further claims that the human embryo in its development passes through the same transformations which its animal progenitors have passed through during immense spaces of time, inconceivable ages ago. [2] This means that man in his progressive embryonic state, resembles in turn the various orders and classes of animals, from the monad and the oyster up to the higher animals; and that when he has developed as an embryo into a vertebrate, he successively takes on the form and appearance of a fish, reptile, a bird and a quadruped.

Romanes presents similar views as follows: "Man's development starts from the specially elaborated nucleus of an egg-cell. When his animality becomes established, he exhibits the fundamental anatomical qualities which characterize such lowly animals as polyps and jelly-fish. And even when he is marked off as a vertebrate, it cannot be said whether he is to be a fish, a reptile, a bird or a beast. Later on, it becomes evident that he is to be a mammal; but not till later still can it be said to which of mammals he belongs." [3]

To the same effect is the statement of Le Conte: "The embryo of a higher animal of any group passes *now* through stages represented by lower forms, because in its evolution (phylogeny) its ancestors did actually have these forms." [4]

Thus the Darwinists maintain that there is an analogy between the various stages of development of the human fœtus and the way in which mankind as a race reached their present exalted condition. In this way proof is claimed for the Darwinian hypothesis, that man, as represented in his ancestors, was at one time a beast; at another, a bird; at another, a reptile; at another, a fish; at another, a polyp; and at another, an animal still lower. Mr. Fiske says: "The human embryo begins to develope as if it were going to become a fish; and then changes its course and acts as if it were going to become a reptile or bird;

(1) *Hist. of Creation*, vol. 1, p. 295. (2) p. 310.
(3) *Darwin and After Darwin*, vol. 1, p. 119.
(4) *Evolution and its Relation to Religious Thought*, p. 149.

only after much delay it assumes the characteristics of mammals." Such is the embryological argument.

We think that this argument owes its plausibility, if not all its strength, to exaggeration. More than half the facts, on which the argument is supposed to rest, are imaginary.

1. The similarity in question is confined to *embryos within the some class.* Darwin, whose presentation of facts is in general careful and accurate, did not recognize the similarity as existing between embryos of different classes, thus: "The embryos of distinct animals *within the same class* are often strikingly similar." He speaks also of "the points of structure, in which the embryos of widely different animals *of the same class* resemble each other." [1] Agassiz expressed the same idea by saying, "A vertebrate never resembles, at any stage of growth, anything but a vertebrate, an Articulate anything but an Articulate, etc. [2]

The testimony of Spencer, as to the *facts*, and we do not quote him for the sake of his *opinions*, is of similar import, but more pointed and decided, as follows: "An impression has been given by those who have popularized the statements of embryologists, that during its development, each higher organization passes through stages in which it resembles the adult forms of lower organisms—that the embryo of a man is at one time like a fish and at another like a reptile. This is not the fact. The fact established is that, up to a certain point, the embryos of a man and a fish continue similar, and that then differences begin to appear and increase—the one embryo approaching more and more towards the form of a fish; the other diverging from it more and more. And so with the resemblances to the more advanced types." [3]

The embryological facts, then, are as follows:

(a) The similarity of embryos is restricted to animals within the same class. It does not cross the lines which separate vertebrates, mollusks, articulates and radiates.

(b) The human embryo in its development does not take on in succession the likeness of the lower organisms, nor even of the higher, as the fish, reptile, bird and beast. In regard to this point, Spencer's emphatic declaration is, "This is not the fact." He attributes the wrong impres-

(1) *Origin of Species*, pp 381, 382.
(2) *Method of Study*, pp. 90-91.
(3) *Biology*, vol. 1, p. 143.

sion to those who have "popularized embryology." While we would not denominate such scientists as Hæckel, Romanes, Fiske and Le Conte mere popularizers of embryology, we do not accept as proved and certain what they have presented in argumentation, so far as their statements are virtually and emphatically denied by such men as Darwin, Agassiz and Spencer.

(c) All embryos are egg-cells and are at first very much alike. As to the embryos of vertebrates, man, beast, bird, reptile and fish, of course at first they are scarcely distinguishable. They are more alike at first than they ever are afterward. As they develop they diverge more and more. As Spencer puts it, the embryos of a man and a fish at first are similar; up to a certain point continue similar; then differences begin to appear, the one approximating more and more towards the form of a fish, the other diverging from it more and more.[1] Thus embryonic development is a process of differentiation. The similarity of embryos is destroyed by development. The only fact, then, which which we have to deal with is this, that embryos at first and before development are similar.

2. Taking up this one fact, the question to be determined is whether the similarity that exists between embryos before development proves or tends to prove that all animals have had a common descent. Does the fact that the human, canine and piscine embryos are originally alike prove that men, dogs, and fishes are descended from the same ancestors?

It is important to remember that in this case as in many others the similarity is only in appearance. After all, embryos do differ as is demonstrated by the fact that different kinds of animals are produced from them. Difference in results proves a difference in antecedents and causes. The fact that differences between embryos do not appear before development cuts no figure in the case. The infant cubs of the bear and tiger are gentle as lambs. The difference between a wise man and a fool is not discoverable by the eye or the microscope. The differences between things are shown by development and its results. "By their fruits ye shall know them." So the similarity of egg-cells is only apparent, as is demonstrated by results. Undeveloped embryos seem alike as objects seen indistinctly. A mule, a horse, a cow, a gate-post and a man all

(1) *Biology*, Vol. 1, p. 143.

look very much alike, when seen at a distance. On a nearer view the similarity disappears, and they are seen to be different. As the beholder approaches these objects, the man does not put off the appearance of the mule, cow, horse and gate-post, but he simply takes on more and more his own proper appearance; so of all the rest. Just as the human, canine, equine and bovine embryos develop, their differences become perceptible. It is unscientific and absurd to deny the reality of these differences simply because they are not at first visible to the human eye.

3. The fact that the similarity of embryos is within the same class, and that the embryos of vertebrates, mollusks, articulates and radiates are not very similar, completely upsets the argument, so far as the doctrine of universal evolution is concerned. The argument is that, since man and the other vertebrate animals are alike in their embryonic state, therefore they are all descended from common ancestors. But by parity of reasoning, since the embryos of man and the other vertebrates differ from the embryos of the mollusks, therefore vertebrates and mollusks are not descended from common ancestors. The argument cuts both ways; it proves too much for the thorough-going evolutionist. If resemblance of embryos by analogy suggests sameness of descent, then unlikeness of embryos certainly suggests difference of descent. And, since embryonic resemblance does not cross the lines which separate the four great classes of animals, it follows, if the argument we are dealing with is a valid one, that all the animals have not a common parentage, but are descended from four original progenitors, or have been evolved out of four primordial forms. Thus four breaks or chasms would have to be admitted in the descent of animals. All this might be accepted perhaps in accordance with Darwin's suggestion of the derivation of species from a few primordial forms, but of course is intolerable to evolutionists of the more modern school.

4. This is an analogical argument. It is founded on the principle that things that are similar in one respect are likely to be similar in others. Thus it is supposed that because men and other vertebrate animals are similar in their embryonic state, therefore they are all descendants from the same ancestors.

It seems to us that a better analogical argument may be drawn, in favor of evolution, from the fact that all the

individuals of every species originate by a process of evolution. This is an incontrovertible fact, and furnishes an indisputable basis for an analogical argument to prove that the human race and every species originated by evolution; thus the individuals, which now constitute every species, being derived from parents, originate by a process of evolution, therefore the species were derived by a process of evolution from preceding species. This argument shows or at least suggests that evolution is possible, and that it is a reasonable hypothesis.

But the evidential value of analogy is very much overrated. It suggests possibility and may be successfully employed in the way of refutation, but is almost worthless as an argument for the establishment of any truth. Analogy sometimes creates a presumption or a slight degree of probability; but it often suggests nothing more than a mere possibility. All the force which it may have as an argument, on either side of a question, is entirely overcome by the smallest amount of positive counter evidence.

The reason of this is that there are so many irregularities in nature. Very often the discovery of new facts sets analogies and probabilities at defiance. How often do the improbable and the unexpected take place!

In all the departments of nature there are frequent divergences from analogy. In most of the vegetable species, reproduction is by the asexual process. But in some of the vegetable species there are males and females, a divergence from analogy. According to analogy all terrestial flowers should have nectar, but some are entirely destitute of it. According to analogy, acorns and hickory-nuts should grow on crawling vines or small plants, but pumpkins and gourds on oaks and elms. If the anti-teleologists are right, the danger of people having their heads broken by the fall of large fruits from the tops of tall trees had nothing to do in causing the present arrangement, by which little fruits grow on large trees and large fruits on little plants. The existence of one mother (called the queen), hundreds of drones and thousands of working neuters in each hive of bees is contrary to all analogy. A very similar anomaly is found among the white ants called Termites, in each nest of which propagation is carried on by a single pair called king and queen, or father and mother, the latter of which lays an egg every minute. The bee

communities present many additional anomalies.[1] The polyandry of queens, each having several hundred husbands; the fertility of unimpregnated queens; their continued fertility from the one impregnation, the loss of life by the drone in the act of impregnation; the fertility of the working bees, called neuters, without impregnation, in the absence or disability of the queen; the fertility of the unimpregnated queen and of the neuters resulting in the production only of drones; the killing of the drones by the workers at the close of the breeding and working season; —all these facts are contradictions to analogy.

Nearly all birds make each its own nest, and have a strong parental instinct. But the cuckoo lays its eggs in the nests of other birds and takes no care of its offspring. The most of the fishes deposit their eggs in nests, or in suitable places for hatching, but the eggs of the hippocampus (pipe-fish) are carried about by the male in a caudal pouch, or in hemispherical pits in its skin. The eggs of the Arius Boakeii are carried in the mouth of the male until they are hatched.[2]

All these facts are entirely contrary to analogy. They are just such as we would not expect, judging from previously known facts.

But we find also that in the astronomical world irregularities are not infrequent. According to analogy, Jupiter ought to have but four satellites, whereas it has five. According to analogy, the earth having one satellite, Mars 2, Jupiter 5, Saturn 8, Uranus ought to have 16 or 18 satellites, and Neptune 32 or more; whereas Uranus has but four known satellites and Neptune but one. Nearly all the bodies of the solar system revolve from west to east, and reasoning analogically from known facts we would conclude that all the planets and their satellites, and probably all the celestial bodies, revolve in the same direction. But it is now ascertained that this analogy must be set aside in the case of the four satellites of Uranus and the one satellite of Neptune, which revolve from east to west. Judging by analogy, we would expect to find between Mars and Jupiter, a planet of intermediate size, in the region of the asteroids. But no such planet is found. It has indeed been suggested, in order to preserve the analogy, that the asteroids are the shattered fragments of

(1) See chapter 6th, pp. 289-297.
(2) Spencer *Biol.* vol. 2, p. 415.

a former planet. But be it so; the hypothesis does indeed save the analogy at one point, but only to break it at another. For a shattered planet is a great anomaly. Certainly neither planets nor fixed stars have often exploded.

Such facts, many more of which might be presented, indicate that, while in general, regularity and uniformity prevail in the world, at the same time we need never go very far to find irregularities and anomalies. There are laws that are inflexibly uniform in their operation, as the law of gravitation, laws of attraction, the chemical laws of affinity, etc. But the law of analogy is not of this sort. Indeed analogy is not a law at all in the proper sense of the word. As we have shown above, so far as the establishment of truth is concerned, analogy is a fallacious guide. Its main use in the discovery of truth is by way of suggesting possibilities and hypotheses. Analogy suggests that other planets beside the earth may have inhabitants, but does not prove it. Analogy suggests that, as the satellites circulate round their primaries, and the primaries round the sun, so the sun and the whole solar system circulate round some unknown central body, and that unknown central body round a larger unknown central body, and so on. Analogy furnishes this conjecture, but does not furnish proof. So analogy suggests that as each individual of every species is derived from preceding individuals by an evolutionary process, so may each species have been evolved from preceding species. Analogy furnishes the hypothesis and suggests the possibility of evolution, but furnishes no proof of its actuality.

By means of analogy some remarkable predictions, or rather *happy guesses*, have been made. Voltaire in his *Micromegas*, A. D. 1750, represents his travelers as visiting the planet Mars; and, although remaining on it but a short time because of their fear that they might not find sleeping-room, as discovering that it was attended by two satellites. Dean Swift, in his *Gulliver's Travels* (1726) represents the astronomers of Laputa as having, with their superior glasses, discovered two satellites of Mars. It is certainly remarkable that Voltaire and Swift did thus anticipate the discovery of these two satellites. But they reasoned from false premises, In their time Jupiter was supposed to have but four satellites, the fifth not being discovered till 1892. Hence they reasoned thus: the earth has one satellite and Jupiter four; therefore Mars, the in-

termediate planet, has two. The conclusion was indeed correct, but was reached through mistake. The knowledge of the real number of Jupiter's satellites would have spoiled the proportion. According to the present proportion, Uranus ought to have sixteen satellites at least, twice as many as Saturn ; but it has, so far as known, only four.

We have thus spoken of the uncertainty of analogy as a source of proof and argument, for the reason that, though Darwin expressly declares that "analogy may be a deceitful guide,"[1] there are many Darwinians, able and learned men, who rely largely upon it as proof of their hypothesis. These in their argumentation say again and again, in substance, often in express terms : "If Darwinism be true, we would expect to find things so and so, and we are not disappointed." In all such reasoning the appeal is to analogy, with all its uncertainty and its liability to be set aside by experiment, observation, discovery or other form of positive evidence.

VIII. There is one more argument which Darwinists are accustomed to employ in favor of their hypothesis, and it is this : that we must accept Darwinism or we will have neither theory or hypothesis to account for the origin of species. This argument is generally presented with special reference to the theory of special creations, in some such way as follows : there are but two hypotheses proposed to account for the origin of species—*special creations* and *natural selection*. But the former is out of the question ; it is abandoned or soon will be and ought to be. It is now either natural selection or nothing. Hence we must accept natural selection.

But even if the falsity of the theory of special creations were clearly demonstrated, it would not follow that Darwinism is true. It may be that both the one and the other is untrue. Most assuredly the admitted or demonstrated falsity of the one does not prove the correctness of the other. If a murder has been committed, and only two men are suspected of the perpetration of the crime, the fact that one of them is shown to be innocent does not prove the guilt of the other. It would not be well to urge that we must believe the second man to be guilty on the ground that otherwise we could not even guess who committed the murder. If there are but two proposed ways of going to the North Pole, and it should be demonstrated

(1) *Origin of Species*, p. 419.

that one of these ways is impracticable, it does not follow that we must endeavor to reach the North Pole by the other. Perhaps a third and better way will be discovered. In the meantime we would perhaps better stay at home and make no effort to go to the North Pole. We do not, then, accept the dictum of Spencer that, "We have to choose between two hypotheses—the hypothesis of special creation and the hypothesis of evolution."[1] We may reject both alternatives, and wait for a third hypothesis.

But, after all, there is something to be said, and a good deal to be said, in favor of the theory of special creations, as we endeavor to show in a succeeding chapter. [2]

(1) *Biology*, vol. p. 331.
(2) See Chapter VII.

CHAPTER X.

DARWINISM AND TELEOLOGY.

It is claimed, in behalf of Darwinism, by some of its advocates, and only by some of them, not, as we think, a majority, that it has destroyed teleology, at least that branch of it which teaches that the various adaptations and contrivances in nature indicate design, and thus prove the existence of a rational and intelligent Creator and Ruler of the universe. Huxley at one time claimed that Hæckel, of Germany, had given "the death blow to teleology." [1] Similar language was employed by Prof. Romanes during the time of the eclipse of his Christian faith. Among other things he said that the evidences of design, including the evidences of beneficence, have been tapped at their fountain-head by Darwinism, and that the appearance of any future Paley, Bell or Chalmers has been made impossible. [2] Fiske affirms that teleology "rests on a rotten foundation;" [3] proclaims that "natural selection has dealt destruction to the theistic arguments of Paley and the Bridgewater Treatises." [4] Prof. Le Conte decides that "evolution has destroyed forever" what he contemptuously describes as "the man-like, cabinet-making, watch-making design of Paley and older writers—a separate petty design for each separate object." [5]

Spencer, who sets the fashion for so many talkers and writers, oraculously pronounces teleology a failure. Speaking of rudimentary organs he says: "Here, as before, the teleological doctrine utterly fails." [6]

Such is the attitude of some evolutionists and Darwinists toward teleology. Is the claim thus put forward

(1) *Critiques and Addresses*, pp. 272.
(2) *Darwin and After Darwin*, Vol. 2, pp. 411-2.
(3) *Cosmic Philos.* Vol. 2, p. 286.
(4) *Idea of God*, p. 129.
(5) *Evolution* etc., p. 357.
(6) *Biology*, vol 1, p. 386.

correct? Has the argument drawn from evidences of design in nature to prove the existence of God been nullified and destroyed?

We hold that teleology has not been and cannot be destroyed; that it is established on sure foundations; and that whatever comes in conflict with it ought to be and will be rejected. If, then, Darwinism be in any degree anti-teleologial, which, however, we do not affirm, it ought to be, and will be, rejected; or must be modified so as to harmonize with the facts and truths of teleology.

I. *Teleology is a well established truth.*

The history of human opinions shows that belief in design as manifested in nature, like belief in God, human responsibility, and the immortality of the soul, *are too deeply imbedded in the human mind ever to be eradicated.*

The teleological argument has been accepted and employed by the most learned and ablest men both of ancient and modern times. Belief in it has not been confined to the learned. It appeals to the common sense of the great mass of mankind; and, to this day, it is one of the strongest popular arguments against atheism.

1. Teleological views *appear in the Old Testament Scriptures.* The old Hebrew writers believed in *final causes*, as is shown by such declarations as these: "He that planted the ear, shall he not hear? He that formed the eye, shall he not see?" [1] Similar ideas are expressed elsewhere in the Psalms [2] and also in the book of Job. [3]

2. The best and ablest Greek philosophers were teleologists. Socrates referred to the construction of the human body—the eyes, ears, nose, mouth, teeth and other organs, as proofs of contrivance and wisdom. After referring to the structure of the eye; to the eyelids, opening like doors when needful and closing at the approach of sleep; to the eye-lashes, guarding the eye and, like a fence, keeping off wind and dust; to the eye-brows, prepared as a kind of shed to turn off the perspiration which otherwise would enter and injure the tender organ; to the teeth, some in front suited to cutting, and some back in the mouth suited to masticating; to the mouth, so situated that nothing can enter it without passing near the nose and eyes for the detection of unsuitable food; and to other adaptations and adjustments, he then asked if it is possible to doubt that such an arrangement of parts is the work,

(1) Ps. 94:9. (2) Ps. 19 and 104. (3) Chaps. 38, 39.

not of chance, but of wise and benevolent design. By such illustrations, the great philosopher of common sense is represented by Xenophen as bringing his pupil Aristodemus to declare his belief in the existence of a wise and benevolent Creator. "I have no longer any doubt (replied Aristodemus), and indeed the more I consider it, the more evident it appears to me that man must be the *masterpiece* of some great artificer, manifesting unmistakable marks of the love and favor of the maker." Socrates further taught that as the eye of man sees many objects, and as the soul governs the body, "so there is a Being whose eye pierces through all nature, whose ear hears every sound, and whose bounty and care are co-extensive with the creation." [1]

Such are the teleological views held and taught by Socrates. It is well known that similar views were held by Plato, his pupil and friend. Teleological ideas abound in some of his writings, especially in the Timæus. All through this book, with constant recurrence, are found such thoughts as can be translated into English only by such words as *God*, *Deity*, *Divinity*, *Divine*, *God of Gods*, *Creator*, *Maker*, *Artificer*, *design*, *purpose*, *contrivance*, *pattern*, *plan*, *model*. Like Socrates, but much more extensively, he illustrates by examples drawn from human physiology. He says, "Our Creator planted the human head with hairs in order to guard the brain and protect it from the extremes of heat and cold." He speaks of the purpose of the liver; the purpose of the intestines; and the purposes of mouth, teeth, tongue, lips and other organs. [2] Thus he specifies the most of the organs and parts of the human body, accounting for them on teleological grounds. [3] The way in which he speaks of God as the Artificer of the universe, planning and constructing according to his own far-seeing wisdom, and making everything to accomplish a beneficent and beautiful design, is of course distasteful to that class of Darwinists who make an outcry against what they call *anthropomorphism* in teleology.

Aristotle also, who represents the culmination of Grecian thought, recognized design or purpose as one of the four kinds of cause. He identified the final cause of a thing, or the reason for its existence, with the *good*, the end aimed at by God, the First Cause, or Prime Mover. [4]

(1) *Memorabilia*, 1:4. (2) *Timaeus*, 47, 52, 53. (3) 16.
(4) *Metaphys*, I, 2, 3; XI, 7.

Neither Socrates, Plato, nor Aristotle referred expressly to mechanical contrivance exhibited in human machinery, in order to illustrate or establish the teleological idea.

3. This, however, was done by Cicero. The watch was not employed by him as an illustration, for in his time the watch was unknown. But the clock is found among his many illustrations of design and contrivance—"How happens it that when you view an image or picture, you imagine it is wrought by art; when you behold afar off a ship moving in its course, you do not doubt but that it is steered by wisdom and skill; when you see a dial or a clock, you understand the hours are declared by art, not by chance; and yet you should think that the world, which contains all these arts and artificers, is void of design and reason." Cicero further referred to what now would be called an orrery, but which he described as a sphere, invented by Posidonius to show the movements of the sun, moon and planets. He supposed this instrument to be carried to Scythia or Britain, and asked, who in those barbarous countries would doubt its having been constructed by intelligence? He next adverted to the Epicureans, "who doubt whether the universe is not the effect of chance or necessity rather than the work of reason and a divine mind, and who think the imitations of the revolutions of the celestial bodies display more ability than the production of them by nature."[1]

4. The teleological argument has been accepted by *nearly all the great thinkers of Christendom in times preceding our own;* or, rather should we say that *nearly all the people of Christendom, unlearned and learned alike, have in past times held the teleological idea.* For the belief has been almost universal that the wisdom of God is manifested and proved by what are called the works of nature. But wisdom is the ability to employ and adapt means to accomplish good purposes.

As a matter of fact, then, we must consider as teleologists the fathers and leaders of the early Christian church; the theologians of the middle age; the reformers of the 16th century; the theologians both Protestant and Catholic; the philosophers, scientists, and the literary men in general, together with the great mass of enlightened people for eighteen hundred years. About the only exception among the thinkers of the past age was Kant, who

(1) *De Natura Deorum*, 2:34.

cast doubts upon the teleological as well as upon other arguments in favor of the existence of God.

It is indeed sometimes claimed or suggested that at least one other of the great thinkers of the past was opposed to teleology. We refer to Bacon, who is often quoted or alluded to as condemning final causes. He certainly did condemn, and in very strong terms, the abuse of this doctrine, but not the doctrine itself, nor its proper use. He declares that teleology (finales causæ) not only has in many cases rendered science unfruitful, but has even *wonderfully corrupted philosophy*.[1] But this mischief he attributes not to final causes themselves, but to their misuse; viz, the mixing of them up with physical enquiries, as by Plato and Aristotle. After specifying many examples of design and condemning the intermingling of such teleological facts with physical and secondary causes, he immediately adds, "*Not because these final causes are not true and worthy of being investigated, but are injurious outside of their province.*"[2] After all then, the father of the inductive philosophy believed in the excellence and usefulness of teleology, when rightly handled. Francis Bacon thought in this manner—"I had rather believe all the fables in the legend and the Talmud, and Alcoran than that this universal frame is without a mind."[3]

5. *Very many of the modern sceptics called Deists, and even the most distinguished of them, have recognized the validity of the teleological argument.*

Of this class was Lord Bolingbroke of England. This man was certainly neither superstitious nor prejudiced in favor of teleology. He was thoroughly sceptical though a Deist. He was of the class who are often called infidels. His "Philosophical Works," in five volumes, are a contiued attack on Christianity. Yet he advocated Theism and divided denunciation and abuse between the clergy and the atheists. He abused nearly everybody with whom he differed. Leslie Stephen, a thorough-going Agnostic, says: "Bolingbroke succeeds in calling everybody who differs from him fool, knave or madman."[4] He professedly labored to vindicate the character and works of God against "the attacks of atheists and divines." He was a thorough-

(1) Phosophiam miris modis corripuerunt. (*Novum Organum* 1:48).
(3) *Essay* 16, on Atheism. (2) *De Augmentis*, lib 3, cap. 4.
(4) *Hist. of Eng. Thought*, vol 1. p. 177.

going teleologist. Referring to what Cicero said concerning the sphere of Posidonius, he declares that if the orrery were sent in our days to the Hottentots, "these savages would smile at the stupidity of any of their brethren, if any so stupid should be found among savages, who could imagine such a machine to be the effect of chance, or to have contrived and made itself." [1] He also reproduces the illustration of the clock and declares that as the adaptation of means to ends in its construction proves the intelligence of the workman, so the adaptation of means to ends in the universe indicates the wisdom of the Creator.

Lord Herbert of Cherbury, another distinguished Englis Deist, though sceptical in regard to Christianity, accepted and relied on the teleological argument as proof of the existence and moral character of God. Hallam declares it to be a remarkable fact that Lord Herbert in his "*De Religione Gentilium*" employed the same illustration which was afterword employed by Paley in his presentation of the teleological argument.

Voltaire also anticipated Paley in the use of the illustration of the watch. Whatever may have been the character and opinions of this famous Frenchman, he never was an advocate of atheism. He denounced atheism and fanaticism both as monsters. When comparatively a young man, he presented, in his "*Treatise on Metaphysics*," the teleological argument for the existence of God. To theism and teleology he adhered all his life. Parton says: "*The watch proves the watch-maker*, was his constant argument for the existence of God, at every point of his life, and he developed it in his treatise some years before Paley was born." [2]

Hume was equally decided in his acceptance and avowal of theism and teleology. "The whole frame of nature bespeaks an Intelligent Author; and no rational inquirer can, after serious reflection, suspend his belief a moment with regard to the primary principles of genuine Theism and Religion." And again: "Though the stupidity of men, barbarous and uninstructed, be so great that they may not see a Sovereign Author in the more obvious works of nature to which they are so much familiarized, yet it

(1) *Phil. Works*, vol. 4, p. 158.
(2) Parton's Life of Voltaire, vol. 1, p. 333.

scarcely seems possible that anyone of good understanding should reject that idea, when once it is suggested to him. A purpose, an intention, a design is evident in everything; and when our comprehension is so far enlarged as to contemplate the first rise of this visible system, we must adopt, with the strongest conviction, the idea of some intelligent cause or author." * * * * "What a noble privilege is it of human reason to attain the knowledge of the Supreme Being; and from the visible works of nature, be enabled to infer so sublime a principle as its supreme Creator?" [1]

We call special attention to the declaration—"*A purpose, an intention, a design is evident in everything.*"

Thomas Paine, though he perhaps did not know the meaning of the word teleology, gave expression to teleological sentiments, as follows: "The true Deist has but one Deity, and his religion consists in contemplating the power, wisdom and benignity of the Deity in his works, and in endeavoring to imitate him in every thing moral, scientifical and mechanical."—"The Creator made nothing in vain."—"When we examine an extraordinary piece of machinery, an astonishing pile of architecture, a well executed statue, or a highly finished painting, * * * our ideas are naturally led to think of the extensive genius and talents of the artists. * * * How then is it, that when we study the works of God in Creation, we stop short, and do not think of God?" [2]

Another of the famous sceptics of modern times, J. S. Mill, after years of investigation and reflection, accepted the teleological argument as legitimate and valid. He was from childhood indoctrinated by his father in atheism, and he remained an atheist till near the close of his life. But in his "*Three Essays*," written not long before his death, with a view to setting forth his most mature opinions, he declared that "the adaptations in Nature afford a large balance of probability in favor of creation by intelligence." This large balance of probability in favor of the existence of a Creator he attributes mainly to the argument from marks of design. Though he says the force of this argument is generally overrated, yet he declares it to be "an

(1) Hume's *Essays.—The Nat. Hist of Religion*, Introd., and Sec. XV.

(2) *Age of Reason, Discourse to Soc. of Theophilanthropists Paine's Works*, pp. 41, 46, 291.

argument of really scientific character, which does not shrink from scientific tests." He further declares that "the argument is not one of mere analogy. As mere analogy it has its weight, but it is more than analogy. It surpasses analogy exactly as induction surpasses it. It is an inductive argument." [1] There are several considerations that impart great value to Mills' judgment in this matter: (1), his previous life of scepticism and atheism; (2), his ability as logician, as shown by his elaborate work on logic; (3), his acquaintance with, and acceptance of, Darwinism and of the doctrine of "the survival of the fittest." [2] There is not the shadow of a ground in his case for the charge of ignorance, prejudice, or theological bias. His clear, calm and dispassionate treatment of the subject is in marked contrast with the course of many on the other side, who assume and assert and keep on asserting that Paley's argument has been destroyed.

6. *A majority of the most distinguished scientists of our age have accepted teleological views.*

On this point we quote the following declaration of Prof. Cocker, of Michigan University:

"The belief that a principle of adaptation to special ends pervades all existence, and that it must be assumed as the ground of the scientific explanation of the facts and phenomena of the universe, is avowed by the first scientists of the age." [3]

One of these scientists who thus avow the teleological belief is Prof. Cocker himself. Another is Lord Kelvin (Sir William Thompson), who, in his inaugural address at the meeting of the British Association of Science at Edinburgh, said: "I feel profoundly convinced that the argument from design has been greatly lost sight of in recent speculations. * * * Overwhelmingly strong proofs of Intelligence and Benevolent Design lie all around us; and if ever perplexities, whether of a metaphysical or scientific character, turn us away for a time, they will come back upon us with irresistible force, showing us through nature the influence of a *Free Will*, and teaching us that all living beings depend upon one ever-acting *Creator* and *Ruler*." Another of these teleological scientists was Agassiz. We need but name him. Another was Hugh

(1) *Three Essays on Religion*, pp. 167. 168, 170.
(2) *Three Essays on Religion*, p. 172.
(3) *The Theistic Conception of the World*, p. 129.

Miller. Another was Dr. Hitchcock, President of Amherst College, Professor of geology and natural theology, and author of a work on geology. [1] Another was Dr. McCosh, late President of Princeton University, author of many very able works, not a determined opponent of Darwinism, but a thorough-going defender of teleology and the argument from design. Another was Professor Jevons of University College, London, an evolutionist and Darwinist, who says: "So far as we can see, infinitely diverse living creatures might have been created consistently with the theory of evolution, and the precise reason why we have a backbone, two hands with opposable thumbs, an erect stature, a complex brain, about 223 bones, and many other peculiarities, is only to be found in the original act of creation. I do not, any less than Paley, believe that the eye of man manifests design." He also speaks of the causes which produced the eye as being "subject to the arbitrary choice of the Creator." [2]

Another of the scientific teleologists is Prof. J. Parsons Cooke, LL. D., Professor of chemistry and mineralogy in Harvard University. In his work, published in 1864, but re-written and re-published in 1880, entitled, "Religion and Chemistry, a Restatement of an old Argument," he says: "Paley has compared the mechanism of nature to a watch, and, so far as the argument for design is concerned, the analogy is perfect." He further says: "The unity of design implies the oneness of the designer, and although the adaptations just considered may not exclude every possible atheistic theory of cosmogony, yet they show conclusively that, if there is design anywhere, there is design everywhere; if there is design in the least, there is design also in the greatest, and design in the atom may thus confirm the evidence of design in man." [3]

Among the teleologists are also to be counted Prof. Gray, Professor of Botany in Harvard University; Prof. Winchell, of Michigan University; Prof. Dana, of Yale; Prof. Guyot, of Princeton University; Sir J. W. Dawson, LL. D., F. R. S., Principal and Vice-Chancelor of McGill University, Montreal, Canada. Of these, Gray and Dana are favorable to the doctrine of evolution. Dawson is a decided opponent of Darwinism.

(1) See his "*Religion of Geology*," Lect. VII.
(2) *The Principles of Seience*, p. 763.
(3) *Religion and Chemistry*, pp. 30, 64.

Such are some of the facts embraced in the history of teleology. Our list of teleologists, including those that have held teleological ideas as well as those that have accepted the argument from design, is as follows:

1. Moses, David, Isaiah, Paul and the Hebrew writers in general.

2. Socrates, Plato, Aristotle and other philosophers among the ancient Grecians.

3. Cicero, the most cultured man among the ancient Romans.

4. Irenæus Origen, Clemens Alexandrinus, Augustine, and in general the fathers and leaders of the early Christian church.

5. Anselm, Bernard, Abelard, Aquinas, and in general the theological chiefs of the middle age.

6. Philosophers, scientists and literary men of a later age—Bacon, Newton, Copernicus, Galileo, Kepler, Pascal, Cuvier, Leibnitz, Locke, Boyle, Bentley, Reid, D. Stewart, Shakespeare, Milton, Moliere, Le Sage, Saint Pierre, Beattie, and many others.

7. The ablest and most distinguished sceptics—Voltaire, Hume, Rousseau, Paine, Lord Herbert, Bolingbroke and John S. Mill.

8. Statesmen—Cromwell, William of Orange, Grotius, Burke, Brougham, Webster, Lincoln, Bright, Gladstone.

9. Modern theologians—Luther, Calvin, Knox, Melancthon, Turretine, Edwards, Butler, Paley, Chalmers, Fenelon, Bellarmine, Owen, Howe, Cudworth, Barrow, Charnock, Robert Hall, Hengstenberg, Tholuck, Wesley, Watson, Hodge, Whewell, Dick, Wood, the Alexanders, Mason, Guthrie, Shedd, Kurtz, Flint, Breckinridge, Channing, Dabney, Peabody, Calderwood, Spurgeon.

10. Philosophers, scientists, and literary men of our own and immediately preceding times—Agassiz, Miller, Cousin, Carlyle, Sir William Hamilton, McCosh, Trendelenburg, Lord Kelvin, Principal Dawson, Prof. Cocker, Prof. Dana, Prof. Gray, Prof. Guyot, Prof. Winchell. Just here we quote again the declaration of Prof. Cocker, of Michigan University, that teleology "is avowed by *the first scientists of the age*."[1] Truly Dawson, Cocker, Kelvin, Gray, Dana, Guyot and Winchell are among the first scientists of the age.

Besides all this, for eighteen hundred years, the be-

(1) *The Theistic Conception of the World*, p. 129.

lief of the great mass of the people has been teleological.

In view of these facts, the boastful claim that teleology has been destroyed by Darwinism is out of place, and is well nigh ridiculous. On the other hand, there is a strong presumption that ideas so generally accepted by the greatest minds in ancient and modern times are well-founded and true.

II. *The anti-teleologists virtually give up the case by admissions which not only nullify their arguments, but overthrow the doctrine which they advocate.*

We hold that this is done by all the anti-teleologists, with one possible exception, Spencer.

1. We begin with Darwin. Many, of course are ready to point to him as an instance of a great and logical mind rejecting teleology. We think, however, that all the facts of his inner consciousness taken together, his doubts and struggles, his advances and relapses, his atrophied faculties and tastes (our meaning will be made evident in a little while), his apathies, and his oft-repeated admissions, —all these taken together are decidedly favorable to the teleological view and argument. In early life he greatly admired Paley's *Natural Theology*—"hardly ever admired any book so much—could almost have said it by heart."[1] His five years' course in the universities of Edinburg and Cambridge was a waste of time, except so far as the study of Paley was concerned—"the study of Paley's Moral Philosophy and Christian Evidences was the only part of the academical course which was of the least use to me in the education of my mind."[2]

At this period of his life he believed in the Divine origin of the Bible and Christianity, and he even contemplated becoming a clergyman—"had the bump of reverence developed enough for ten priests."[3] But in time all that was changed. "I gradually came to disbelieve in Christianity as a divine revelation."[4] But at the time of the publication of his "*Origin of Species*," he was still a believer in God, but even on this point he became sceptical. After all, he never got rid of theism and the argument from design. His confession of difficulty, doubt, hesitation, struggling and staggering is interesting, but pitiful. At one time, he

(1) *Life and Letters*, Vol. 2, p. 15.
(2) vol. 1, p. 41.
(3) *Life and Letters*, vol. 1, pp. 39-41
(4) vol. 1 p. 278.

writes as follows: "I am in an utterly hopeless muddle. I cannot think that the world as we see it is the result of chance; and yet I cannot look at each separate thing as the result of design. * * * Again I say I am and shall ever remain in a hopeless muddle."[1] At another time he wrote thus: "Another source of conviction in the existence of God, connected with the reason, and not the feelings, impresses me as having much more weight. This follows from the extreme difficulty, or rather impossibility, of conceiving this immense and wonderful universe, including man with his capacity of looking backwards and far into futurity, as the result of blind chance or necessity. When thus reflecting I feel compelled to look to a First Cause having an intelligent mind in some degree analogous to that of man; and deserve to be called a Thiest. * * * But then arises the doubt, can the mind of man, which has, as I fully believe, been developed from a mind as low as that possessed by the lowest animals, be trusted when it draws such grand conclusions?"[2] Again writing to Mr. Graham, Darwin said: "Nevertheless you have expressed my inward conviction, though far more vividly and clearly than I could have done, that the universe is not the result of chance. But then with me the horrid doubt always arises, whether convictions of man's mind, which has been developed from the mind of the lower animals, are of any value or are at all trustworthy. Would any one trust in the convictions of a monkey's mind, if there are any convictions in such a mind?"[3]

It cost Darwin a protracted effort and struggle to get rid of the argument from design, and he never did get rid of it. It troubled him as long as he lived. This is one of the things in regard to which he said, "To this day I can never reflect on them without being staggered."[4] And in view of the indications of design in the construction of the eye, he was constrained to say: "To suppose that the eye, with all its inimitable contrivances, could have been formed by natural selection seems, I confess, absurd in the highest degree."[5] He had this, among other considerations, in view, when he wrote to Huxley, "I entirely agree with

(1) Life and Letters, vol. 2, p. 146.
(2) *Life and Letters*, vol. 1, p. 282.
(3) *Life and Letters*, vol. 1, p. 285.
(4) *Origin of Species*, p. 154.
(5) *Origin of Species*, p. 167.

you that the difficulties on my notions are terrific."[1] To Prof. Gray he wrote: "The eye to this day gives me a shudder, but when I think of the fine known gradations my reason tells me I ought to conquer the cold shudder." And again: "I remember well the time when the thought of the eye made me cold all over; * * * and now small trifling particulars often made me very uncomfortable. The sight of a feather in a peacock's tail, whenever I gaze at it, makes me sick."[2]

When some one[3] spoke of the wonderful contrivances for certain purposes in nature, and of Darwin's own remarkable words on this subject in "*Fertilization of Orchids*," and remarked that it was impossible to look at these contrivances without seeing that they are the effect and expression of Mind, Darwin's answer was, "Well, that often comes over me with overwhelming force; but at other times it seems to go away."[4]

It is Darwin himself who tells us that, up to the age of thirty and beyond it, he delighted in music and poetry, reading with relish Shakespeare, Milton, Gray, Byron, Wordsworth, Coleridge and Shelley; but that he experienced a curious and lamentable loss of the higher æsthetic tastes and of all relish for poetry.—"But now for many years I cannot endure to read a line of poetry; I have tried lately to read Shakespeare, and found it so intolerably dull that it nauseated me. * * * My mind seems to have become a kind of machine for grinding general laws out of large collections of facts, but why this should have caused the atrophy of that part of the brain alone on which the higher tastes depend, I cannot conceive. A man with a mind more highly organized or better constituted than mine, would not, I suppose, have thus suffered; and if I had to live my life again, I would make a rule to read some poetry and listen to some music at least once every week; for perhaps the parts of my brain now atrophied would thus have been kept active through use. The loss of these tastes is a loss of happiness, and may possibly be injurious to the intellect, and more probably by enfeebling the emotional part of our nature."[5]

There are indications that this atrophy of Darwin's

(1) Life and Letters, vol. 2, p. 147.
(2) Life and Letters, vol. 2, pp. 67, 90.
(3) The Duke of Argyle
(4) Life and Letters, vol. 1, p. 285.
(5) *Life and Letters*, vol. 1, pp. 81-2.

brain and higher æsthetic tastes, though its evil effects were known and acknowledged by him, nevertheless were injurious to his intellect and moral nature to a degree of which he was not aware. With all his doubts, scepticism and unbelief in regard to God and his overruling providence, he indulged in the use of such expressions as "Thank God—I hope to Heaven—I wish to Heaven—Well, thank Heaven—I hope to God—God knows—By Jove—Even wish to God—Great God!—By Jove, as far as my memory goes—Thank God—What the devil determines each particular variation?—God forgive me—After what the Pall Mall Gazette and the Chronicle have said, I do not care a d——."[1]

The facts then in regard to Darwin and his views are as follow:

(1.) He struggled with theism and teleology all his life after the publication of his "*Origin of Species*."

(2.) The teleological question was never settled in his mind. He confessed that the argument from design "often came upon him with overwhelming force."

(3.) He admitted that the thought, that the universe could not have originated by chance, was irresistible; but he allowed this thought to be set aside by "the horrid doubt" (as he called it) that since man is descended from the lowest animals, the convictions of his mind on this subject are no more trustworthy than those of a monkey.

(4.) Teleological facts and views never ceased to trouble him. The thought of the human eye and its contrivances, according to his own confession, made him shudder, and the sight of a beautiful feather in a peacock's tail, to use his own expressions, made him exceedingly *uncomfortable, sick, and cold—cold all over.*

(5.) His brain and higher tastes were *atrophied*; his mind became a *machine*; the finest literature was intolerable; the reading of Shakespeare was nauseating to him.

(6.) Evidently he regarded the teleological as the strongest of all the arguments urged in behalf of theism. When debating with himself the question whether there is a God in heaven, this argument was uppermost in his mind, and according to his own confession, and notwithstanding the atrophy of his brain and soul, came upon him often with overwhelming force, put him in a muddle, and

(1) *Life and Letters*, vol. 2, pp. 28, 166, 169, 170, 174, 194, 196, 258, 282, 326, 329.

made him cold and sick. He himself, as we will hereafter show, recognized, to the fullest extent, adaptations and contrivances in nature, wonderful, ingenious, perfect, far transcending all the adaptations and contrivances which man can invent or imagine.[1]

It is not at all wonderful that Darwin shivered and shuddered, hesitated and fluctuated, and at times was overpowered in his struggle with teleology and theism.

In view of these facts, we hold that the case of Darwin on the whole is by no means unfavorable to teleology. He struggled hard to get rid of the argument from design, but never succeeded. It often came upon him with overwhelming force, notwithstanding his efforts and struggles against it.

2. Another of the anti-teleologists is Prof. Hæckel of Jena, Germany, to whom we have already so frequently alluded. He is the inventor of dysteleology, which he declares to be the science of rudimentary organs, and defines it as *the theory of purposelessness*. He claims that this so-called science "is alone sufficient to refute the fundamental error of the teleological and dualistic conception of Nature."[2] According to his representation, there are rudimentary organs that have become imperfect and diminutive through disuse and are on the road to complete disappearance, "adapted for a purpose, but without inreality fulfilling that purpose"—"arrangements the purpose of which it is utterly impossible to make out."[3] The facts thus expressed and implied are as follow:

(1.) All organs in their normal condition have a purpose or design.

(2.) The rudimentary organs, in their original condition, before they became atrophied and dwarfed through disuse, had a purpose and fulfilled it.

(3.) If an organ ceases to fulfill the purpose to which it was adapted, it atrophies and finally disappears. Hæckel says expressly, "If an organ degenerates from non-use, this degeneration ends finally in a complete disappearance."[4]

According to these facts and views, teleology is triumphant along the whole line. The organs in general, all the organs that are in their normal condition, fulfill each a

(1) *Fertilization of Orchids*, p. 351.
(2) History of Creation, vol. 2, p. 353.
(3) History of Creation, vol. 1, p. 12, 15-16, 17, 249.
(4) *Hist. of Creation*, vol. 1, p. 249.

definite purpose. Even the rudimentary organs must be accounted for on the teleological principle. They came into existence each for a definite purpose, and when they cease to fulfill the definite purposes to which they were adapted, they begin to disappear and must finally be annihilated. These representations and admissions establish teleology. The manifestation of a definite purpose or design is admitted in nearly all the organs, in all indeed that are in their normal condition; and even the rudimentary organs, few comparatively in number and destined to be entirely obliterated, are accounted for on the teleological principle, that formerly they existed for a definite purpose and actually fulfilled it. A wart on a man's cheek and a mole on his chin do not prove that his eyes, nose, mouth, teeth and tongue are without design and use, especially if it were admitted that these little excrescences formerly themselves answered a good and definite purpose, and are now destined to disappear.

3. Huxley fell in with Hæckel's dysteleological views, and even exultingly claimed that the German professor had "given a death blow to teleology." But after making this declaration, he proceeds at once to suggest (as we have before mentioned) that the facts of dysteleology cut two ways, and place the advocates of this hypothesis in a dilemma; for the reason that useless organs, as evolutionists generally assume, atrophy and disappear. But the rudimentary organs so-called do not disappear, but persist and have persisted for ages. Hence they are not really rudimentary; or if they are, they must yet be useful and serve some purpose. For otherwise as useless organs they would have been long ago obliterated. But in either case their dysteleological value is gone.[1] Darwin recognized these admissions of Huxley as damaging to the dysteleological hypothesis and as confirming the argument from design. He wrote to Huxley as follows: "My Dear Huxley:—I have been delighted to see your review of Hæckel, and as usual you pile honours high on my head, But I write now to groan a little over what you have said about rudimentary organs. Many heretics will take advantage of what you have said about rudimentary organs."[2] It is not strange that Darwin *groaned* over the fact that Huxley virtually admitted the anti-teleological argument drawn from rudimentary organs to be invalid

(1) Critiques and Addresses, pp 274-5.
(2) *Life and Letters*, Vol. 2, p 299.

and worthless; for this is about the only argument that the anti-teleologists can employ.

4. We have mentioned Prof. Romanes as one of those who set aside the doctrine of design in nature and the argument derived from it. This was during the time of the eclipse of his Christian faith. But even when the eclipse was at its height, his declarations and doubtless his real belief were strikingly inconsistent with his avowed theory. He admits that the adaptations in nature involve an innumerable multitude of special mechanisms even within the limits of any one species. He pronounces these adaptations and mechanisms to be *astounding*. He declares "these mechanical contrivances are, for the most part, no merely simple arrangements. * * * On the contrary, they everywhere and habitually exhibit so deep-laid, so intricate, and often so remote an adaptation of means to ends, that no machinery of human contrivance can properly be said to equal their perfection from a mechanical point of view. Therefore, without question, the hypothesis which first of all they suggest—or suggest most readily—is the hypothesis of design."[1] He thought, however, that this conclusion could be resisted on the ground that the world and its contents were not *suddenly* created, but arose *gradually*, one species being produced from another. But in the course of time, he accepted the argument from design and Paley's presentation of it. He announced his belief that the teleology of Revelation supplements that of Nature and that Paley's writings form an excellent illustration of the identity of the teleological argument from Nature and from Revelation, though Paley himself seems not to have observed the similarity of the argument as developed in his *Natural Theology* and *Evidences of Christianity*. He thought that Paley erred in appealing only to reason, and in not recognizing the spiritual nature in man; but he declared that no one has developed the argument in both cases better than Paley. Thus the accomplished and talented G. J. Romanes, M. A., LL. D., F. R. S., of Cambridge, England, an evolutionist and defender of Darwinism, accepted teleology and Christianity, and began to pray after a silence of a quarter of a century. [2]

(1) *Darwin and After Darwin*, vol. 2, pp. 280-281.

(2) Romanes' *Thought on Religion*, edited by C. Gore, pp. 144, 190, 191.

5 We have quoted the allusion of Le Conte to what he is pleased to call "*the man-like, cabinet-making, watch-making design of Paley.*" The Professor seems to think that it would be too small a business and too man-like for the Almighty to engage in the making of eyes and fingers, bones and joints, little insects with their tiny wings and limbs, the little flowers with their petals and pistils, spots and tints, and to attend to other minutiæ in creation and providence. He undoubtedly believes that there is nothing too great or immense for God, but he seemingly thinks there are for Him countless things too minute. Hence he rejects the teleology of Paley. He discards all distinct, separate, petty, man-like design, and insists on the conception of "one infinite, all-embracing design stretching across infinite space and continuing unchanged through infinite time." [1] Yet in immediate connection with the above quoted declaration, the author affirms, "There is design in everything." Design in everything? Then there is design in the eye, ear, finger, joints, and every organ of the human body; in every beast, bird, reptile, fish, bug and insect; in every flower, herb and blade of grass. For all these are things, and Le Conte assures us *there is design in everything*. He himself has employed both the watch and the eye as illustrations and proofs of teleology; and even maintained there are ingenious and wonderful contrivances for beauty as well as for use. [2] It seems that he must have forgotten all this when he was applying such depreciatory terms as *petty* and *cabinet-making* to design as presented by Paley. [3] It would seem, too, that, for the time, he must have forgotten that the Divine one of Nazareth taught that the care and providence of God extend even to every little bird and to every hair that grows on a human head.[4]

6. Fiske, too, who disparages and reviles the current teleology, falls into inconsistencies similar to those mentioned above. Take the following statements in regard to the course of evolution and the bringing of the universe into its present condition, as examples: "Every one of the myriad little acts of life and death during the entire series of geologic æons was assisting. The whole scheme was teleological, and each single act of natural selection

(1) *Evolution*, &c., pp. 348-357.
(2) *Religion and Science*, pp. 27-62.
(3) *Evolution and its Relation to Religious Thought*, pp. 348-357.
(4) Matt. 10:29-30; Luke 12:6-7.

had a teleological meaning." [1] This declaration is as far reaching and inclusive as anything written by Paley or any other advocate of teleology. It sets forth not only that the whole scheme of the universe has been directed for the accomplishment of a grand result, but also that every event and every act of natural selection has been directed in the same way. If every act of natural selection had a teleological meaning, then must the eye, the ear, and every joint and every limb, and every part of every organic being, have a teleological meaning and adaptation. For, according to Darwinism, the eye, the ear and every organ of the human body and of the bodies of the lower animals together with things in general, even the minutest things, in the the universe, barring a few original forms to begin with, and the doings of sexual selection (which after all is but a branch of natural selection) are the production of natural selection. According, then, to this deliverance, the eye, the ear and every organ of the human body, and every organ of the bodies of the lower animals, together with almost everything else in the universe, give evidence of design.

It is thus that Hæckel, Huxley, Romanes, Le Conte and Fiske, by their admissions and statements, virtually give up their case, and fall in with Paley and Chalmers. Such inconsistency and self-contradiction are not surprising. For teleology, belief in manifestations of God's wisdom, goodness and purposes throughout nature, the work of His hands, is implied in the very idea of God. Whoever is not an atheist, but believes in the existence of a Creator and Ruler of the universe, must acknowledge the manifestation and proof of divine power, wisdom, goodness plans and purposes in both nature and providence. The only way for an anti-teleologist, who believes in God, to avoid self-contradiction, is to be silent in regard to teleology and the works and the providence of God.

It is largely in this way that Spencer has avoided the inconsistencies which characterize so many of the other anti-teleologists. He notices teleology only to declare oracularly that it fails. He writes as if he had never heard or thought of contrivances in nature. He would seem to be ignorant of all that has been said on this subject by such men as Darwin, Romanes, Lubbock and other modern scientists about adaptations and contrivances—"ingenious

(1) *The Idea of God*, p. 161.

—"delicate"—"exquisite"—"admirable"—"wonderful"—"transcending in an incomparable degree all the adaptations and contrivances which the most fertile human imagination could suggest." [1] He has no doubt read Darwin, and perhaps also Lubbock. But he seems to be blind and deaf, and is at least dumb in regard to matters of this kind. Besides he is almost an atheist. He speaks disdainfully of "the mechanical God of Paley;" [2] but *his* god, denominated "the unknown first cause" and "the inscrutable power of the universe," is not God at all. It is something without personality, knowledge, thought, emotion, love, mercy or goodness. Spencer calls it the inscrutable power, and teaches that all that can be known about this power is that it is unknowable.

Spencer's theological notion reminds us of Crambe in Martinus Scribblerus. "Crambe swore that he could frame a conception of a Lord Mayor not only without his horse, gown, and gold chain, but even without stature, feature, color, hands, head, feet, or any body, which he supposed was the abstract of a Lord Mayor." Spencer's abstractive genius is almost equal to that of Crambe; he empties the theistic idea of every attribute but power and even declares that inscrutable.

The above facts explain why Spencer did not fall into inconsistencies and self-contradictions, like so many of the other anti-teleological scientists. Ignoring contrivances in nature almost entirely, and reducing God almost to an abstraction, he was as little concerned about teleology as the man who murmurs in his heart, "There is no God."

III. The opposition to the argument from design, on the part of theistic Darwinists, proceeds, at least in many cases, *from disbelief in a particular Providence.*

The thorough-going atheist rejects teleology because he believes there is no God in heaven, and therefore concludes that there can be no manifestation of divine forethought and design in things on the earth or anywhere else. The agnostic doubts whether there is a Creator and Ruler of the world, and therefore calls in question the validity of the teleological as well as of every other argument for the existence of God. Any man, though he be a full believer in Theism, who has made up his mind against the doctrine of a particular Providence, if he reason slogically,

(1) See farther on in this chapter.
(2) *Universal Prog.*, p. 299.

must hold that God has neither knowledge nor care of minute things, and therefore does not manifest either design or goodness in the eye or ear or any organ, or any separate existence or separate event known to men. Such a man may indeed believe that God has some grand and general design, which things in general tend to accomplish; but his belief that God does not care for, nor think of, minutiæ and details, will lead him logically to conclude that there can be no manifestation of design in any particular process, existence or event. And perhaps he will not always refrain from expressing contempt and aversion for such an idea. Thus the opponents of teleology are very apt to proceed on the assumption (often not expressed) that God neither knows nor cares for small things, nor for individual organs, processes or events. If the assumption be admitted, the rejection of teleology is the logical result.

Darwin set the example of reasoning in this way. Almost his only argument consists in references that almost seem intended to ridicule the doctrine of a particular providence. To offset the case of a man killed by lightning, accepted as an event designed by the Almighty, he wrote as follows: "If you believe so, do you believe that when a swallow snaps up a gnat that God designed that that particular swallow should snap up thät particular gnat at that particular instant?" [1] He also referred in similar style to the shape of his own nose, which was very peculiar. On account of it, his application for the place of naturalist on the *Beagle* came very near being rejected. Afterward he referred to his queer-looking nose as an argument in opposition to the teleological views both of Sir C. Lyell and Prof. Gray. To the latter he wrote as follows: "I have lately been corresponding with Lyell, who, I think, adopts your idea of the stream of variation having been led or designed. I have asked him (and he says he will hereafter reflect and answer) whether he believes that the shape of my nose was designed. If he does I have nothing more to say." [2]

Darwin put forward these facts, the peculiar shape of his own nose, and the devouring of a gnat by a swallow, as representatives of small events and of things in general. And evidently he reasoned as follows: *Since there is no manifestation of divine design in the snapping up of a partic-*

(1) *Life and Letters*, vol. 1, p. 284.
(1) *Life and Letters*, vol. 2, p. 170.

ular gnat, by a particular swallow, at a particular time, nor in the peculiar construction of my nose, there is no manifestation of divine design in any other small event or small thing; and hence there is no manifestation of divine design in the greatest and the grandest things and events.

In this way, teleology is supposed by some to be refuted altogether. Others, and we understand Le Conte and Fiske to be of this number, do not push the conclusion so far as to reject teleology entirely. Authors of this class seem to think it too small a business for the Almighty to govern, or even to know, little things; and hence they reject teleology as taught by Paley and Chalmers, but are willing to admit that God has a grand design, to the accomplishment of which all things tend, though they are by no means careful to indicate what in their judgment that grand design is.

In regard to this rejection of the doctrine of a particular Providence and the consequent partial or total rejection of teleology, we remark as follows:

1. Those who reason in this way do so in opposition to the plain declarations of the great teacher, Jesus of Nazareth. The doctrine of a particular Providence was prominent in his teachings He expressly taught that not a sparrow falls to the ground without God, or is forgotten before God. He further declared that even the hairs of our heads are all numbered. [1] He thus affirmed that the knowledge and agency of God extend to the smallest and minutest things. He also taught the doctrine of a particular Providence, as well as of creation, in declaring that God feeds the ravens, clothes the grass of the field and arrays the lilies in glory greater than that of Solomon. [2] The doctrine of a particular Providence is involved in the duty and privilege of prayer as taught by Christ, "Give us this day our daily bread." [3] This petition can be offered in prayer only by those who believe that there is a God in heaven who rules over the little as well as the great affairs of earth, and who knows the secret thoughts and desires of the human heart. The same truths are implied in the declaration, "Every idle word that men shall speak they shall give an account thereof in the day of judgment." [4] For if God takes cognizance of and will judge the com-

(1) Matt. 10:20-30. Luke 12:6-7.
(2) Luke 12:24-8. (3) Matt. 6:11.
(4) Matt. 12:36.

paratively unimportant, idle words of men, he must know the time, occasion and circumstances of their utterance.

Thus the Christ, the greatest moral and theological teacher of all time, set forth and affirmed again and again that God's knowledge and overruling providence extend not only to the great affairs of the universe, but also to the insignificant and minute.

2. Christian and enlightened people, together with nearly all the heathen who had any theological knowledge or belief worth speaking of, have in all ages believed, and profoundly believed, in a particular Providence. This belief will not be abandoned at the suggestion and behest of a few scientists and philosophers.

3. True philosophy and sound common sense teach that there can be no general Providence without a particular Providence, no control of great events without control of little ones. Causes and effects are so linked together that the greatest of events often depend on little causes, on causes as insignificant in themselves as the destruction of an insect or the shape of a man's nose. He that rules the great events of the universe must, in order to do so, rule the little events as well. He that would construct a machine, start and keep it running, must attend to every part and keep every part in good condition. He must not omit or neglect any part however small. The omission or breakage of the smallest wheel, or of a single cog in the smallest wheel, of a clock or watch will render the instrument utterly useless. So the management of the world involves attention to little things without number.

4. There are adaptations and contrivances in little and unimportant things, as well as in great and important things. This point will be elaborated farther on. For the present, we urge attention to this consideration, that it is illogical and unreasonable to admit the manifestation of design in great matters because of evident adaptations and contrivances, and to reject design in small matters though manifested by adaptations and contrivances just as evident. The sceptical Darwinist virtually says: "There are adaptations and contrivances in great matters, and these I admit as evidences of the existence of a divine Creator and Ruler, on the ground that there cannot be design without a designer, nor contrivance without a contriver. There are also adaptations and contrivances in small things, even in the tiny flowers of small and frail vegetables. But I do

not admit that these contrivances manifest a contriver, or that these manifestations of design prove a designer; I set aside the argument for design and a designer, on the ground that if there indeed be a God, it is too small a business for Him to concern himself about little vegetables and their tiny flowers." The atheistic Darwinist, and the thorough-going agnostic, more consistently, but none the less illogically, reject the teleological argument altogether, maintaining that in great as well as in small matters there may be contrivance without a contriver, design without a designer, and thought without a thinker.

IV. The existence of rudimentary organs has often been urged as an objection to teleology. Darwin, Hæckel, Huxley, Le Conte and others claim this fact as a refutation of the argument from design. But the reasoning and admissions of these men do but strengthen our confidence in the validity of this argument.

1. The claim that the rudimentary organs are useless, and are therefore without design, is an admission that *organs in general are designed for particular uses.* Take the following declaration as an example: "The same reasoning power which tells us plainly that most parts and organs are exquisitely adapted for certain purposes, tells us with equal plainness that these rudimentary or atrophied organs are imperfect and useless." [1] This statement virtually concedes the whole question at issue. For since it is "*plain that most parts and organs are exquisitely adapted for certain purposes,*" it is plain that in most parts and organs there is evidence of design and of a Designer. The fact that such evidence is wanting in some parts and organs does not destroy the evidence where it actually exists It is admitted on all hands that the rudimentary and useless organs are few as compared with the organs that are in their normal condition and are useful. The former may be compared to a few witnesses summoned to court who know nothing about the case in hand, and on the witness stand have nothing to say. The latter are a crowd of witnesses who testify positively and point-blank to the facts of usefulness and purpose. The hands are useful organs. Every finger, joint, nail, muscle, nerve and vein is useful. The hand by its ingenious construction, adaptation and usefulness manifests thought and design. A few useless warts upon the hand do not change its character nor de-

(1) *Origin of Species*, p. 393.

stroy its significance.

2. *The explanation of rudimentary organs given by Darwinists is a confirmation of the argument from design.* That explanation involves the idea of usefulness and design. Rudimentary organs are of two kinds—organs *atrophied* by disuse, and *nascent* organs, those that have started to grow but are not yet sufficiently developed to be useful. Both kinds of organs are accounted for on teleological grounds. The atrophied organs are supposed formerly to have answered a purpose and to have been useful. The nascent organs are supposed to have been originated with a view to future usefulness and to be destined, when developed, to answer a particular purpose. Thus both classes of rudimentary organs are illustrations of teleology. In the explanation of them, Darwinists fall back upon the hypothesis of usefulness, adaptation and purpose.

V. Another argument employed to overthrow teleology is the fact that *there is a great deal of misery in the world.*

Darwin said, "There seems to me too much misery in the world." [1] Spencer, in arguing against special creations, alludes to the countless pain-inflicting appliances and instincts with which the lower animals are endowed, and to the warfare and carnage that have prevailed among sentient creatures in general. [2] Fiske reasons in the same way, and declares physical and moral evil to be proofs of awkwardness or malevolence.

We make the following suggestions:

1. The origin and existence of physical and moral evil are *profound mysteries.* Most men are willing to admit that they do not understand them, and are not disposed to draw arguments from them to prove or disprove disputed points.

2. The prevalence of evil in the world may be employed with just as much show of reason to disprove that there is a God in heaven as to disprove design in nature. If the existence of evil in the world proves the absence of design and wisdom in the affairs and management of the world, it will prove equally well that God neither created nor rules the world, which is downright atheism.

3. We should not exaggerate the misery that is in the world. It is true that there are much sin, crime and suffering. It is true that there is suffering everywhere, and that almost every man and every animal suffers at one time

(1.) *Life and Letters*, vol. 2, p 105.
(2.) *Biology*, vol. 1, pp 340–7.

or another. But after all, even among men, in this life, notwithstanding their sins and crimes, there is more happiness than misery. There are more healthy people than sick people; more that are in comfortable circumstances than are very poor; more that are rejoicing than mourning. Job describes the wicked as living in prosperity and pleasure, and as suffering only for a brief space at the time of their death. "They spend their days in wealth, and in a moment go down to the grave." [1] The Psalmist makes a similar representation. He describes the people of the world, the great majority of mankind, as living in ease and carelessness, and even as having "no bands in their death." They have indeed pains and terrors, but these are sudden and brief. [2] The Bible does indeed represent the wicked as very miserable, but that is in view of approaching punishment for sin. Their present life is represented as being in a majority of cases thoughtless, careless and merry. Darwin has given much the same view of human life, and of animal life in general, as follows: "According to my judgment, happiness decidedly prevails"—"all sentient beings have been formed so as to enjoy, as a general rule, happiness"—"how can the generally beneficent arrangement of the world be accounted for?" [3] Thus, though Darwin said "there seems to me to be too much misery in the world," he nevertheless held that there is more happiness than misery, more pleasure than pain. This predominance of happiness proves that the Maker of the world is not malignant nor cruel. Had he been a Being of malignity and cruelty, he would not have "formed sentient beings to enjoy happiness as a general rule," nor have allowed the arrangement of the world to be generally beneficent. On the other hand, the predominance of happiness over misery in the world indicates at the very least that God prefers to make his creatures happy, and that the evil in the world is to be accounted for by some reason or necessity which now we do not understand nor know.

4. It is evident that the pain and misery in the world *have not been desired nor produced for their own sake.* Not one single organ in man's body, or in that of any brute, has for its purpose the production of pain. No one claims that even rudimentary organs tend to make their possessors unhappy. On the other hand it is maintained that the

(1) Job 21 : 7-13 (2) Ps. 73 : 3-19.
(3) *Life and Letters*, vol. 1, p 279.

atrophied organs once answered a purpose and were useful and that the nascent ones are destined to become useful, or at least have been started for that purpose. The pain experienced in any part or organ is only incidental. Evidently the part or organ does not exist for the sake of the pain and for the purpose of tormenting the possessor. A tooth is liable to ache, but evidently it was not made in order that it might ache. The aching is incidental and occasional. Its end and normal use are mastication. So of the tongue, ear, eye, hand and all organs and parts of the bodies of men and beasts. And so too of all the arrangements in the universe, so far as we have any knowledge of them. Their tendency and their intention (though the intention must be in the mind of the Maker and Arranger) are to produce convenience, comfort and happiness. The incidental evils do not destroy the proofs of benevolence furnished by the end, adaptations and general tendency of the arrangements.

5. But the teleological argument *is not destroyed by the fact that there are contrivances in nature for the purpose of destroying and killing*.

The anti-teleologist may point to the lions, tigers, hyenas, bears, panthers, cats and other pugnacious and carnivorous animals, and say, "See there! these animals, with teeth and fangs and claws are adapted and designed to kill and devour, are they?" We answer, yes. The construction of these animals, together with their instincts, indicates contrivance and a contriver. Even contrivance for a bad purpose is still contrivance, and contrivance demonstrates thought and a thinker. But the existence of the predacious animals is not for a bad purpose. They are needed. Death among the lower animals is a necessity. But for death, any one of the species of animals would soon overcrowd the earth, and in the end pile it sky-high with writhing bodies. Since animals must die, it is best they should be killed and devoured. Far better to die suddenly by the stroke of a lion or other wild beast than to die of old age, or disease or starvation. It is well too that the bodies of dead animals should be devoured. Otherwise they would decay on the surface of the earth and breed stench and disease. After all, then, the existence of predacious animals with their teeth, tusks, fangs and claws, and their flesh-devouring instincts, indicates adaptation and contrivance, and at the same time a benevolent purpose.

Even among human beings, as they now exist on the earth, death is expedient and necessary, unless natural laws should be reversed. What would be the result if death was impossible among men? What would be the state of things if men were compelled to live on in spite of all wounds and mutilations and the effects of disease? Some men have their hearts pierced and lacerated; some men have their brains crushed and scattered; some have their lungs cut and lacerated, or wasted away by disease; some have their bodies torn to pieces or blown to atoms by explosions; some rot through disease; and all who live long become enfeebled and decrepit and helpless through age. If death among men should be abolished, and natural laws should not be reversed, what a world we would have!—men without heads, men with crushed brains, men with bodies torn in pieces, men with bodies blown to atoms, men and women enfeebled, broken down, paralyzed with old age, blind, deaf, dumb, idiotic, and becoming still more helpless with advancing years. Besides all this, if death were abolished, the human race in a short time would increase to such an extent that there would not be standing room for them on the earth.

The suffering and death that are in the world, then, do not disprove teleology. It is strange to find men who acknowledge the existence of God urging as an argument against teleology the fact of the prevalence of physical and moral evil, an argument which might equally well, if not better, be employed in favor of atheism. It is the one which Lord Byron represents Cain, under the tutelage of the devil, as employing before he stained his hands with his brother's blood[1] The argument is more appropriate in the mouth of the first murderer than from the pen of a theistic philosopher.

VI. Objection has been urged against teleology on the ground of what is called *anthropomorphism*. The objection is that teleology assimilates God to men. It is claimed that to speak of God as adapting means to accomplish his purposes is to represent him as doing what men do. The truth, however, is that all theists, including Mr. Fiske, who has so much to say against anthropomorphism, ascribe to God human qualities as attributes. What are justice, wisdom, holiness and mercy in God? They are simply human qualities designated by these names, only enlarged

(1) *Cain*, Acts II, Scene II.

and exalted. If any one is utterly ignorant of these qualities in men, he cannot conceive of them as attributes of God. Wisdom consists largely in adapting means to ends. To ascribe wisdom, or any other attribute, intellectual or moral, to God is to liken him to men. For men possess in some degree every attribute of God, except infinity and eternity. Men possess power, but not power to an infinite degree—omnipotence; men possess knowledge, but not to an infinite degree—omniscience; men occupy space, but not to an infinite degree—omnipresence. So with regard to God's other attributes—justice, holiness, goodness, mercy and truth. If to ascribe these qualities to God as possessed by him to a perfect and infinite degree is anthropomorphism, then are we anthropomorphists. "God is a Spirit;" so said the great teacher of Nazareth. Here, then, is some more anthropomorphism, for there is a spirit in man. God is also a person. What is a person? A person is a living being that knows, thinks and reasons. The lower animals are not persons, for they lack rationality. That God is a person is certainly another anthropomorphic idea.

Fiske says that Personality and Infinity are incompatible ideas, and that Infinite person is just as unthinkable as Circular Triangle.[1] Yet he holds, or at least thinks he does, that God is a Person.[2] But he of course holds that he is a *finite* Person. Here, then, we have a doubly anthromorphic idea—God likened to men in being called a *Person*; God further likened to men in being declared a *finite* Person. To the latter idea we object. We hold that God is both a Spirit and a Person (and a Person because a Spirit,) and that he is omnipresent, omniscent, omnipotent, eternal and infinite.

There is a kind of anthropomorphism which we abjure —the kind which would limit either the power or the attributes of God. It was perhaps to be expected that one who objects to "Infinite Power" and "Infinite Person" as involving anthropomorphism,[3] should charge Paley as well as Voltaire with "seeking to limit and localize the Deity."[4] Were it not for the solemnity of the subject, and for the lamentable irreverence and error involved, it would be amusing to find men objecting, on the ground of anthropo-

(1) *Cosmic Philos.*, Vol. 2, pp. 408-9.
(2) *Idea of God*, pref., pp. xv-xvii.
(3) Fiske *Idea of God*, pref. p. xvi.
(4) *Cosmic Philos.*, vol. 2, p. 425.

morphism, to ideas concerning God, held indeed by Socrates and Plato, but held also by the theologians and Christian people for eighteen hundred years, certainly contained in the Bible, and taught by Christ and the apostles; and then to find these same objectors turning round and declaring God, like men, to be finite in person, power, knowledge and all his other attributes. What is anthropomorphism, if this not?

VII. After all the main question, and in one sense the only question, in this whole discussion, is this: *Are there adaptations and contrivances in nature?* If the re are, then must there be a Cause and Author of these adaptations and contrivances, not a mere abstraction, not a mere power, but some one who thinks, chooses, foresees, plans and reasons, and who therefore is a Person.

We have already, in the first part of this chapter, shown that the intelligent portion of mankind, the learning, philosophy and common sense of the ages, Christians, Theists, Deists (commonly called infidels, such as Voltaire, Hume, Bolingbroke and Paine,) by an overwhelming majority, have decided in favor of the argument from design, Even to this day confidence in this argument has not been destroyed. Belief in teleology persists notwithstanding the efforts that have been made to overthrow it. Even many thorough-going Darwinists believe in it. Fiske expressly says that "this theory was in high favor during the earlier part of the present century, and is still commonly held."[1] Yes, "it is still commonly held"—held, as we have shown, by many of the most distinguished Darwinists.

The correctness and conclusiveness of the argument as presented by Paley is virtually admitted by the opponents of teleology. As a general thing, they do not attempt to point out any flaw in the reasoning. Not a fact or illustration is called in question. Even its most zealous opponents in general carefully let it alone; or proclaim its destruction through Darwinism or Hæckel's dysteleology. Leslie Stephen, a thorough-going sceptic in religion, an agnostic, or atheist, if he only knew it, writes thus of Paley's *Natural Theology.*

"The only fault in the book, considered as an instrument of persuasion, is that it is too conclusive. If there is no hidden flaw in the reasoning it would be impossible to

(1) *The Idea of God*, p. 119.

understand not only how any should resist, but how any one should have overlooked, the demonstration." Notwithstanding the claim that the book is "too conclusive," the objector admits that the argument is the one "that has the greatest popular force and that still passes muster with the metaphysicians." [1] Whately, in his *Rhetoric*, cautions disputants against reasoning too forcibly and making their arguments overwnelming, lest those, for whom they are intended, should reject them, partly from jealous self-regard and partly from the ill-founded and weak suspicion that a conclusive argument, that does not convince everybody, must be fallacious. We did not, however, suppose that an able writer like Stephen would avowedly and consciously object to Paley on such grounds. The objection is a virtual admission that the teleological argument as presented by Paley is not only logical and strong, but unanswerable.

The teleological argument, instead of being destroyed or even weakened, has been, on the contrary, strengthened by the scientific discoveries of modern times, or at least by the statements and admissions of modern scientists. We refer not to the oft-repeated affirmation—"Evolution is itself the working out of a mighty teleology,"[2] and similar ones made by Fiske and some other writers, but to a different kind of statements, by a different class of writers. Darwin, for instance, testifies again and again to the existence of adaptations and contrivances—delicate, ingenious, exquisite; wonderful adaptations and contrivances in nature. To express his admiration for these manifestations of thought and design, he exhausted the resources of the English language. The recognition of teleology characterizes nearly all his writings, but at present we call attention to his work entitled, "*Fertilization of Orchids*." He begins this charming book as follows: "The object of the following work is to show that the contrivances by which orchids are fertilized are as varied and almost as perfect as any of the most beautiful adaptations in the animal kingdom; and secondly to show that these contrivances have for their main object the fertilization of each flower by the pollen of another flower."[3] As he proceeds in this work

(1) *Hist. of Eng. Thought*, vol. 1, p. 408.
(2) *Cosmic Philos*, Vol. 2 p. 406.
The Idea of God, Pref. pp. xii, xx.
(3) *Fertilization of Orchids*, p 1.

he employs such phrases and makes such declarations as the following: "Many beautiful contrivances—Many curious contrivances—Complex mechanism—Another pretty adaptation—The perfect adaptation of the parts—The perfection of the contrivance—Hardly can adaptations be named more perfect—Complex trap[1] —How numerous and beautifully adapted the contrivances [2]—If not accidental, and I cannot believe it to be accidental, what a singular case of adaptation ! [3]—It is impossible to doubt that these points of structure and function are specifically adapted for self-fertilization. [4]—The meaning of these several contrivances is unmistakably clear.[5] —It has, I think, been shown that orchids exhibit an almost endless diversity of beautiful adaptations. When this or that part has been spoken of as contrived for some special purpose, it must not be supposed that it was originally always formed for this sole purpose.[6] —The more I study nature, the more I become impressed with ever-increasing force with the conclusion that the contrivances and beautiful adaptations transcend in an incomparable degree the contrivances and adaptations which the most imaginative man could suggest with unlimited time at his disposal."[7]

With regard to these declarations, we remark as follows:

(1.) In them Darwin went as far as it is possible to go in affirming the facts on which teleology and the argument from design are founded. He affirmed, affirmed again and again, kept on affirming, affirmed just as did Paley and Chalmers, that there are ingenious, beautiful, grand and useful arrangements, adaptations and contrivances in nature. He never denied the examples of adaptation and contrivance brought forward as proofs of purpose or design, and he added many of his own. He even repeatedly employed the word *purpose*. He thus testifies to the reality of the facts on which teleology and the argument from design are founded.

(2.) It matters nothing, so far as the argument is concerned, that Darwin maintained that the adaptations and contrivances in nature were produced gradually and through natural selection. Contrivance and purpose are the same whether formed and executed suddenly or gradually. As to contrivances and purposes of God, it matters uot wheth-

(1) *Fertilization of Orchids*, pp. 2, 3, 14, 17, 24, 28, 30.
(2) p. 51. (3) p. 53. (4) p. 65 (5) p. 70. (6) p. 351. (7) p. 351.

er they are accomplished immediately by the exertion of his power or through natural laws and forces. In either case contrivance and purpose remain the same.

(3.) Though Darwin did not employ the words *adaptation*, *contrivance* and *mechanism* with a view to ascribing the mental acts of adaptation and design to God as a living agent, he does ascribe them, unconsciously perhaps, to nature. After all, he did not and could not persist even unconsciously in the deification of natural forces and processes. Recognizing, as he did, the many ingenious, wonderful and exquisite adaptations and contrivances in nature as trandescending in an incomparable degree all that the most giften men could invent or imagine, it is not surprising that Darwin, as he himself confessed, was in a muddle in regard to teleology; that the teleological view and belief often came upon him with overwhelming power; and that he escaped mainly by considering that in matters of such high import the human mind developed out of that of the monkey is not to be trusted.

(4.) Let it not be forgotted that Darwin admitted and affirmed the facts on which teleology is founded. He found in nature adaptation, contrivance and purpose, ingenious, curious; wonderful adaptations and contrivances. As there cannot be thought without a thinker, contrivance without a contriver, or design without a designer, either nature is a God, or there is a God of nature. In either case there is a Being of thought and design incomparably superior to men. But nature is mere forces, laws and processes. There is, then, a Designer and Worker above nature.

Another modern scientist who has borne testimony, perhaps unintentionally, in favor of the teleological view, is Sir J. Lubbock. We refer to him, not for the purpose of quoting his opinion, but for the sake of the facts which he presents. These facts are just such as teleologists employ in working out the argument from design. They relate to the fertilization of flower-plants by winged insects. There are many plants that, in order to flourish, must have cross-fertilization, the flowers being fertilized, not by their own, but by the pollen of other flowers. As Sir J. Lubbock says, "The great object of the beauty, scent and honey of flowers is to secure cross-fertilization." The wingless insects would not serve to carry the pollen from one flower to another. But some wingless insects, especially ants, are fond of sweet things. Hence the ants must be prevented

from reaching the nectar in the flowers in order that winged insects may go after it, and thus touch the pollen and carry it from flower to flower. In speaking of the contrivances for preventing the crawling insects from obtaining access to the nectaries, this distinguished author, quoting from Belt, says: "Great attention has of late years been paid by naturalists to the wonderful contrivances amongst flowers to secure cross-fertilization, but the structure of many cannot, I believe, be understood, unless we take into consideration not only the beautiful adaptations for securing the services of the proper insect or bird, but also the contrivances for preventing insects, that would not be useful, from obtaining access to the nectar. Thus the immense length of the angræcum sesquipedale of Madagascar might, perhaps, have been more easily explained by Mr. Wallace, if this important purpose had been taken into account." [1]

The contrivances employed for the purpose of preventing the wingless insects from reaching the nectar in the flowers are very much varied. In some plants the leaves form around the stem a cup, which prevents the ants from ascending. In some species there is a cup at every joint of the stem. Some of these cups collect and retain rain and dew, and thus serve as traps to catch insects.

In some cases the nectar is protected against wingless and climbing insects by smooth and slippery surfaces. In these cases the leaves often form a collar around the stem, with curved surfaces, over which even ants cannot climb. When they come to the slippery edge, they drop off and fall to the ground. In numerous species the access of ants and other creeping insects is prevented by spines or hairs, which constitute a veritable *chevaux de frise*. In many species access to the flowers is prevented by viscid secretions. The sticky substance is found generally below the flowers, but sometimes even on the flowers themselves.[2]

Such are some of the contrivances for the purpose of preventing creeping insects from reaching the nectar of flowers. It is a remarkable and significant fact that the aquatic plants, from which ants are precluded by the surrounding water, are not provided with any of these ingenious means of protection.[3] One species, the polygonum amphibium, as it name implies, grows both on land and

(1) *Ants, Bees and Wasps*, pp. 51-2.
(2) *Ants, Bees and Wasps*, pp. 52-55.
(3) *Ants, Bees and Wasps*, p. 56.

water. The individuals of this species that grow on the land are covered by innumerable viscid hairs, which effectually protect them against creeping insects. But the aquatic individuals have no such protection, being protected by the water which surrounds them.

Such are some of the examples of adaptation and contrivance brought to view by later scientists, such as Darwin and Lubbock.

The question is, are such adaptations and contrivances the result of chance or of design? Are they accidental or are they intended? We have shown that when Darwin reflected on such questions, he was often overwhelmed. At one time he spoke of "the extreme difficulty or rather impossibility of conceiving this immense and wonderful universe as the result of blind chance or necessity." [1] At another time, in reference to a particular adaptation, he exclaimed, "I cannot believe it to be accidental."[2] It is not strange that Darwin so often recoiled from the doctrine of chance. The absurdity of endeavoring to account in this way for the countless useful, and beautiful arrangements, combinations, adaptations and contrivances in the world has been illustrated in various ways. The impossibility of constructing a verse of the Iliad by throwing at random the letters of the Greek alphabet was employed as an illustration by Cicero and Fenelon. Tillotson of England illustrated as follows: "If twenty thousand blind men were to set out from different places in England, remote from each other, what chance would there be that they would end by meeting all arranged in a row, in Salisbury plain?" Of course, the reply must be that such a result is a practical impossibility. And by parity of reasoning we must conclude that the hundreds and thousands and millions of useful, beautiful and complicated adjustments, combinations and adaptations that actually exist in the world could not be brought about without thought and design.

Take, as an example, the human body. Its different organs and parts can perform their functions only when properly adjusted to one another. Every organ and every part must be in its place. An interchange of places by the head and shoulder, or by the stomach and lungs, or by the heart and liver, or by the nose and mouth, or by the eyes and ears, or by the brow and chin, or by the teeth

(1) *Life and Letters*, vol 1, p. 282.
(2) *Fertilization of Orchids*, p. 53.

and toe-nails, or by the arms and legs, or by the hands and feet, or by the fingers and toes, or by other organs, or by other parts, would in most cases prove disastrous. But how could all these organs and parts be properly placed and adjusted without thought, foresight and design? Suppose that all the organs and parts of a human body were already in existence, but separated from one another; suppose that the head, heart, lungs, stomach, liver, kidneys, intestines, neck, shoulders, arms, legs, eyes, ears, nose, mouth, chin, brow, hands, feet, fingers, toes, joints, muscles, bones, sinews, veins, arteries, nerves, and all the other organs and parts, were already existing separately, could a human body be formed by throwing together these organs and parts at random? How often would these many organs and parts have to be thrown in order to construct a human body? Could a human body be thus constructed at all?

The impossibility of such a result is shown by the following illustration: Take the twenty-six letters of the English alphabet. Suppose that each one of these was engraved on a piece of metal, twenty-six pieces of metal in all, and that a man were to attempt to arrange the letters in their usual order, a, b, c, and so on, by throwing together these pieces of metal at random. The difficulty, or rather the utter impossibility, of arranging the alphabet in this way is demonstrated by the immense number of possible combinations of the twenty-six letters. According to the law of permutation, the number of possible combinations of the twenty-six letters is represented by the numbers 1, 2, 3, 4, 5, 6, and so on, up to 26 and including 26 multiplied together. The number thus resulting is 403 septillions, 291 sextillions, 461 quintillions, 126 quadrillions, 605 trillions, 635 billions, 584 millions; or, in figures alone, 403,291,461,126,605,635,584,000,000—27 places of figures. This immense number shows the impossibility of arranging the letters of the English alphabet by random throws. But this number is incomprehensible by the human mind. Its vastness may be faintly suggested by the following representation. If a million of men (1,000,000) were to work 300 days each year during a million of years, writing out combinations of the letters of the English alphabet, and were to cover each day forty pages with 100 combinations on each page, the number of combinations written out would be only a fraction of the whole number of possible

combinations. The number of possible combinations, and of combinations thus written, are as follows :

403,291,461,126,605,635,584,000,000
1,200,000,000,000,000,000
403,291,459,926,605,635,584,000,000

It is thus shown that it would require an inconceivably greater number of men than one million, living and working during an inconceivably longer time than one million years, to write out the possible combinations of the twenty-six letters of the English alphabet. All this shows the impossibility of the proper arrangement of these letters by chance; that is, without thought and design.

But this is not all ; there are more than twenty-six organs and parts to be arranged and adjusted in the formation of every human body. There are in the human frame 232 bones, and when we take into consideration the joints, muscles, sinews, veins, nerves, and all the parts and organs, we may well say the arrangements and adjustments are indeed countless.

The different parts and adjustments in the human hand alone exceed in number the letters of the English alphabet. There are the five fingers (including the thumb) all differing in length and thickness ; three joints in each of the four fingers and two in the thumb, fourteen joints in all ; three little bones, differing in length and thickness, in each of the four fingers and two in the thumb, fourteen in all. Thus in one hand there are twenty-eight (28) joints and bones together, to say nothing about nails, sinews, muscles, veins and nerves.

The impossibility of the adjustment of these twenty-eight bones and joints by blind chance is demonstrated by the illustration above given. This impossibility is doubled by the fact of the existence of nails, muscles, sinews, nerves and veins in the hand. It is quadrupled by the existence of a second hand. This quadrupled impossibility is again increased several fold by the many parts and their adjustments in the formation of the eye. And in view of all the organs and parts of the human body, with their countless combinations, the impossibility of formation by chance becomes as great as the literal passing of a camel through a needle's eye, which is possible *only with God.*

But farther, we must take into consideration the vast number of actual adjustments. There are supposed to be

about a billion and a half of human beings in the world. Children are born at the rate of one per second, and the great majority are born in a normal and proper condition. Perhaps about only one in a thousand is born deformed. Many millions of infants come into the world every year with their bones, muscles, sinews, nerves, veins and all their parts and organs properly arranged and adjusted. We must then add to the problem the vast number of adjustments in the bodies of the millions and millions of the human race. Besides, there are the bodies of the lower animals and the plants and flowers. The utter impossibility of the accomplishment of these countless arrangements and adjustments without thought and design is but faintly represented by the conception of the formation not of one book only, but of a countless number of books, by random throwing of letters. Even a minute contrivance in the fertilization of orchids drew from Darwin, the exclamation, "I cannot believe it to be accidental."[1]

(1) p. 53.

CHAPTER XI.

THE BIBLICAL COSMOGONY.

We hold that the probabilities that are urged in favor of Darwinism are logically counter-balanced, and more than counter-balanced, by the probabilities that may be urged in favor of the hypothesis of special creation.

I. In the first place, the Mosaic cosmogony, which sets forth this hypothesis, is *wonderfully correct.*

We do not claim that the perfect accuracy of this cosmogony can be shown in the present state of human knowledge, though we confidently expect this will be done hereafter in the progress of science. But we do claim unhesitatingly that the scientific accuracy of the first and second chapters of Genesis *in the main* can be, or rather has been, vindicated. And we further claim that this fact indicates that the author possessed superhuman knowledge. For no man, who lived in times preceding our own, could, by the exercise of his own powers alone, have attained to the knowledge of the scientific facts presented in these chapters. Some of these facts are as follows:

1. That the heavens and the earth, nature, all things, the universe, had a beginning.
2. That nature, the creation, the universe, is a consistent whole.
3. That all things existed at first in a state of chaos, in which there was neither light nor life.
4. That the introduction of light and life, and the bringing of the chaotic materials into a state of order and beauty, were a progressive work.
5. The existence of light independent of the sun.
6. The formation of continents by the emergence of land from the water.
7. The existence of vegetable before animal life.
8. That the waters swarmed with life before land animals appeared.
9. That fishes, birds, reptiles and beasts, all appeared before the creation of man.

10. That man is comparatively a late production.
11. The unity of the human race.
12. That man appeared last and as the head and master of all the lower animals.

It is indisputable that the Mosaic economy is much more sober, truth-like and accurate than any of the accounts of creation that have come down to us from former times, and that it sets forth scientific facts which were unknown until revealed by modern science. Its accuracy and superiority have been recognized by many distinguished scientists. Even the sceptical German scientist, Hæckel, expresses his "just and sincere admiration for the Jewish law-giver's grand insight into nature and his simple and natural hypothesis of creation," though he says he can do this "without discovering in it a so-called divine revelation." He charges on this Biblical cosmogony only *two* errors—the geocentric and anthropocentric theories, the first of which it does not set forth and the second is true. [1]

That distinguished scientist, Prof. Dana, did not discover any errors at all in the Scripture account of creation. In reference to the opening page of the Bible, he lays down the proposition that "*this document, if true, is of divine origin.* For no human mind was witness of the events, and no such mind in the early age of the world, unless gifted with superhuman intelligence, could have contrived such a scheme." After setting forth the various points embraced in the first and second chapters of Genesis, he makes the following emphatic declaration: "The record in the Bible is, therefore, profoundly philosophical in the scheme of creation which it presents. It is both true and divine." [2]

Prof. Guyot, of Princeton University, another able and accomplished scientist, held the same views. Prof. Dana, in presenting his views in regard to the cosmogony of the Bible, remarks that "they are essentially those brought out by Prof. Guyot in his lectures," [3] The latter, writing in 1883, says, in regard to his own views: "Prof. J. D. Dana did me the honor to endorse them, almost in full, in his remarkable article on *Science and the Bible*, in the January number of the Bibliotheca Sacra in 1856. He also adopted them in his Manual of Geology, which first appeared in

(1) *Hist. of Creation*, vol. 1, p. 37-38;
(2) *Geology*, pp. 847, 850. (3) p. 846.

1863." [1] This endorsement and adoption appear also in the third edition of his Geology, 1879. Prof. Guyot further makes these declarations: "We may affirm that the best explanation science is now able to give, on this great topic, is also that which best explains, in all its details, the first chapter of Genesis and does it justice."—"To a sincere and unprejudiced mind it must be evident that these great outlines are the same as those which modern science enables us to trace." [2]

Prof. Winchell testifies as follows: "To my mind the inspired epic of Moses presents an accordance with the geological history of the world which is almost, if not quite, supernatural; and is made more intelligible and more wonderful in the light which science has thrown upon it. Even admitting the impossibility of a circumstantial harmony, all conflict has forever vanished." And again: "The author of Genesis has given us an account, which, when rightly understood, conforms admirably to the indications of latest science. * * * * We can show that it exemplifies a most impressive harmony between the utterances of trusting inspiration and the generalizations of rigorous science." [3]

The Duke of Argyle, a man of ability and scientific culture, says: "Certain it is, that whatever new views may now be taken of the origin and authorship of Genesis, it stands alone among the traditions of mankind in the wonderful simplicity and grandeur of its words. * * * * The meaning of those words seem always to be a meaning ahead of science." [4]

Sir J. W. Dawson, L. L. D., F. R. S., of McGill University, Montreal, in his various works, vindicates the scientific accuracy of the Biblical cosmogony. In one of them he expresses his approval of the Duke of Argyle's declarations quoted above. [5]

Many other testimonies of the same import might be given, but we deem those presented above sufficient.

As we have said, we do not think that the perfect accuracy of the Biblical cosmogony in scientific matters can, at the present time, be demonstrated, though we confidently expect this to be accomplished hereafter. As science

(1) *Creation*, pp. 9 and 10.
(2) *Creation*, pp. 134, 135.
(3) *Recon. of Science and Relig.*, pp. 222, 358.
(4) *Primeval Man*, pp. 36, 37.
(5) *Origin of the World*, p. 4.

advances, the scientific accuracy of the opening chapters becomes more and more evident. But already a good deal has been accomplished. We lay down the following propositions as clear and indisputable:

1. The cosmogony contained in Genesis, in point of sobriety, clearness and truthfulness, is in contrast with all the cosmogonies and mythologies current among the ancient nations in general.

2. This cosmogony is admired for its simplicity, clearness and grand insight into nature by the greatest sceptics of our age, of whom Hæckel is an example and representative.

3. In order to prove it incorrect, and thus discredit it as a divine revelation, one of the ablest and most distinguished sceptics of the age charged upon it two errors—the geocentric and anthropocentric theories; the former of which is not contained in Genesis, and the latter of which, as shown by plain facts, is a true theory, and not an error at all.

4. Many of the ablest and most accomplished scientists of the age, (including some Darwinists), Dana, Guyot, Winchell, the Duke of Argyle, Sir J. W. Dawson, and others, find no error at all in the Biblical cosmogony, The errors, if not very few and very small, would certainly have been detected by these men.

5. This account of creation is accurate, even in regard to the existence of light and heat independent of the sun, the appearance of aquatic before terrestrial animals, the emergence of land from among the water, and in regard to some other points which the unassisted human mind could not know in ancient times.

The inference, then, may be legitimately drawn that the Biblical account of creation is characterized by a very high degree of scientific accuracy, an accuracy to be accounted for only by the hypothesis that the writer possessed superhuman intelligence, or was guided by a supernatural influence.

The fact that the Bible is not intended toteach science, and is not a scientific book, only makes the scientific accuracy of the first chapters of Genesis more remarkable and suggestive. The fact that the writer perhaps did not understand some of his own declarations strengthens the probability that he was guided by supernatural inspiration. The hypothesis that Moses did not write the Penta-

teuch, but that it was written long after his time, is of no avail, so far as the subject in hand is concerned; for Genesis and the other books of the Pentateuch were written at least before the Christian era, and the knowledge of many things embraced in the cosmogony could not be attained by the unassisted human mind until after the advent of modern science. The probability then remains that the writer of Genesis possessed superhuman intelligence, or was divinely inspired.

This probability is countenanced and strengthened by another, viz : the probability that *the moral ideas and laws of the Pentateuch had a supernatural origin.* The Decalogue as a moral code is of unparalleled excellence. There may be other codes somewhat like it, but there is nothing equal to it in all literature. But the Decalogue is not the only gem of morality contained in the Pentateuch. When Christ was asked which is the great commandment of the law, he replied, "Thou shalt love the Lord thy God with all thy heart and with all thy soul and with all thy mind. This is the first and great commandment. And the second is like unto it, Thou shalt love thy neighbour as thyself. On these two commandments hang all the law and the prophets." [1] Thus the Great Teacher took the Pentateuch as the root and stamina of his own moral instructions. He corrected mistaken interpretations, but pointed out no errors in the original text. [2] Among the many excellences of the Pentateuchal teaching is the injunction in regard to the treatment of foreigners. Again, and again, and again, did the Mosaic laws command the Jews not to oppress or to vex the stranger, [3] but to love him and treat him as one of themselves. These laws make special provision for the *stranger*, the *fatherless* and the *widow*. [4]

Ideas so broad, exalted and philanthropic are not found in any other moral or political code of ancient times. Nor in fact has any modern nation attained to the high standard of morality as set forth in the Decalogue and the national laws of the Israelites.

Whence came this exalted morality which has been accepted, but not surpassed nor improved, by the most enlightened nations of the earth? It is of no avail to deny the Mosaic authorship of the Decalogue and to say that it originated long after the time of Moses. It originated

(1) Matt. 22:37-40. Deut. 6:4. (2) Matt. 5:31 48.
(3) Ex. 22:21; 23:9 . (4) Lev. 23:22. Deut. 24:19-22.

among the Israelites. The question to be determined is whether the ten commandments and the elevated ideas of the Mosaic code were invented by the narrow and bigoted Jewish mind or came from God. According to the account given in Exodus, and recognized throughout the other Scriptures, the Decalogue was a special gift and revelation from Heaven. This is at least a possible origin; for God *could* give the Decalogue to the Israelites in a supernatural way. But the origination of the Decalogue by the unaided intellect of a Jew seems an impossibility. The superhuman intelligence necessary to the origination of the moral ideas contained in the Decalogue and other laws of the Israelites suggests, therefore, the probability, if not the certainty, of the divine inspiration of the writer of the Pentateuch. This probability strengthens the previous probability suggested by the superhuman intelligence brought to view in the Mosaic cosmogony.

II. But there is another fact to be considered, *the excellence of the early Hebrew theology*. In Genesis and Exodus, throughout the Pentateuch, and throughout the Old Testament as well as the New, the monotheistic doctrine is everywhere and consistently taught that there is but one only the living and true God, the universal Creator and Ruler, who is inconceivably great and glorious, holy, just and good, omniscient, omnipresent and omnipotent. But polytheism, materialism and idolatry prevailed among all the ancient nations. It is indeed true that there is reason to believe that monotheism was the original belief of mankind. But it is certain that this belief gave way to polytheism in very early times. Polytheism, idolatry and other errors were almost universal among the Assyrians, Babylonians, Egyptians and other ancient nations. If there were monotheists among the ancient Egyptians, they succumbed to the polytheism, idolatry, beast-worship and other abuses and abominations which prevailed around them. It is true that the Israelites, their kings, priests and prophets, and the great mass of the people, relapsed into polytheism and idolatry again and again. There was almost a constant conflict between monotheism and polytheism, between the worship of Jehovah and the idolatrous worship of false gods. The former triumphed. For many years previous to the coming of Christ, polytheism and idolatry were unknown among the Israelites. But how was this success attained? First, there were true and lofty

ideas concerning the unity, spirituality, power, majesty, holiness, justice, benevolence and other attributes of God clearly expressed in their books and were put in circulation among the people, Second, there was a succession of prophets, teachers and writers who inculcated these true and lofty theological ideas. But how did these ideas concerning God originate? Why did not the Israelites sink into polytheism, idolatry, beast-worship and other abominations, like all other ancient nations? The account given in the Hebrew Scriptures is that the Hebrew theology was communicated to chosen men by divine revelation, and that the protest against polytheism and idolatry, amid opposition and persecution, was by men whose souls were touched and directed by a divine influence. The cause thus assigned is at least adequate to account for the sublime theology of the Hebrews and for its preservation amid all opposition. The naturalistic and humanitarian view, that the superiority of the Hebrew theology was due to the extraordinary talent or genius of the Jewish people, narrow-minded, ignorant and prejudiced though they were, assigns an inadequate cause, and is therefore inadmissible. The hypothesis that Moses and other Jews, by their own talents and genius, rose not only above their own nation, but above all the nations of antiquity, and became the theological teachers of the most enlightened people in all ages, is not easily credible. In view of all the facts, the hypothesis suggested in the Hebrew Scriptures themselves, and accepted by Christian people in all ages; namely, that "*holy men of God spake as they were moved by the Holy Ghost*," is adequate, and is at least probable. Here then is another probability which every candid investigator and reasoner must take into consideration in connection with the superhuman intelligence manifested in the Biblical account of creation.

III. Still farther: some of the Biblical writings have such moral power and exert so blessed an influence, are so well adapted to human wants, and especially to the wants of Christians, and are so excellent in various ways, that it is improbable that they could have been produced by minds merely human, especially by Jewish minds. We refer to the Psalms, Proverbs and Prophecies of the Old Testament and to the Gospels of the New. But for the sake of brevity we will take the Psalms as an example. They are wonderful as mere poetry. Fenelon said: "No Greek or Latin

poetry is comparable to the Psalms." Melancthon: "They are the most elegant work extant in the world." Milton: "Not in their divine argument alone, but in the very critical art of composition, they may be easily made appear, over all the kinds of lyric poesy, to be incomparable." Schlegel in his "*History of Literature*:" "They possess a splendor and sublimity which, considered merely as poetry, excite our wonder, and disdain all comparison with any other composition."

The Psalms are also wonderful for their matter. They anticipate and even exceed the best thoughts and sentiments of the most devoted, learned and cultured Christians of modern times. Dr. Shedd has said: "The lyric writers of the Christian church have been distinguished for excellence in proportion as they reproduced the Psalter in the forms of modern metrical composition." Dr. Tholuck: "The Psalms are the hymn book for all times—they are flowers that always bloom in the beauty of youth." Lamartine: "David is the Psalmist of eternity." Gladstone: "They have dwelt in the Christian heart, and at the very centre of that heart, and wherever the pursuits of the inner life have been most largely conceived and cultivated, there, and in the same proportion, the Psalms have towered over every other vehicle of devotion." Such are the Psalms—all of them written by Jews, and many of them, among these the grandest and most beautiful and most edifying, written by a Jewish shepherd more than three thousand years ago. Such are the facts. How are these glorious and elegant Psalms to be accounted for? Since every effect must have an adequate cause, these Hebrew lyrics must have had a higher origin than the hard, uncultivated Jewish intellect. If the Hebrew Psalmists had not the aid of a divine influence, their productions are unaccountable. The argument has been well stated by the celebrated John Bright, of England, as reported by Gladstone:

"John Bright has told me that he would be content to stake upon the Book of Psalms, as it stands, the great question whether there is or is not a divine revelation. It was not to him conceivable how a work so widely severed from all the known productions of antiquity, and standing upon a level so much higher, could be accounted for except by a special and extraordinary aid calculated to produce special and extraordinary results; for it is reasonable, nay needful, to presume a due correspondence between the

cause and the effect. Nor does this opinion appear to be otherwise than just. If Bright did not possess the special qualifications of the scholar or the critic, he was, I conceive, a very capable judge of the moral and religious elements in any case that had been brought before him by his personal experience."[1]

But it would not be logical to restrict divine inspiration to the Psalms. If they are divinely inspired, there is a presumption that other Hebrew Scriptures also are inspired, and among these the Pentateuch, including Genesis and the account of creation. If there is divine revelation anywhere in the Bible, it is quite probable or even certain to be found in the opening chapters of the first book. If there is a supernatural element in the Psalms, it is almost impossible to resist the conclusion that supernatural intelligence was employed in writing the first two chapters of Genesis.

IV. Once more: this probability is strengthened, made indeed, as we think, overwhelming, by facts brought to view in the New Testament. Jesus Christ is the world's greatest teacher. Such is the verdict of enlightened people. He taught with authority. He had the right and the power thus to teach. Even J. S. Mill, who had atheism instilled into him when a child and retained his atheistic views to an advanced age, yet after mature deliberation came to the conclusion that there are indications of a Creator; and that the grounds for belief in His existence "are sufficient to take away all antecedent improbability" of a revelation from Him.[2] Mill even declared "that to the conception of the rational sceptic, it remains a possibility that Christ actually was what he supposed himself to be—a man charged with a special, express and unique commission from God to lead men to truth and virtue."[3] But Christ's belief in his own divine commission is certainly good proof of its reality. He was no self-deceived enthusiast. He knew more about himself, and is a more competent and trustworthy witness in the case, than sceptics who lived many centuries after Him. Even to most sceptics the supernatural commission of Christ and his superhuman character are not only possibilities, but probabilities. Rousseau exclaimed: "Yes, if the life and death of

(1) *The Impregnable Rock*, p. 183
(2) *Three Essays*, pp. 212, 213.
(3) p. 255

Socrates were those of a sage, the life and death of Jesus were those of a God."[1] He also said: "Consider the books of the philosophers, with all their pomp, how little they are compared with the Gospel.[2] Is it possible that a book so sublime and so simple should be the work of a man? * * * No Jewish authors were capable either of such diction or such morality; and the Gospel has marks of truth so grand and striking, so perfectly inimitable, that the inventor would be more astonishing than the hero."[3] Goethe, who was a genuine doubter, styled Christ *the Divine Man*, and said: "I pay him devout reverence, I bow before him."[2] Renan, the late French sceptic, called Him "the incomparable man to whom the universal conscience has decreed the title of the Son of God."[4]

Christ in his own person and character was faultless. He is the only one so represented in all the Bible. All other men mentioned in it are declared to be morally imperfect. He alone of all men is represented as sinless. He himself acknowledged no crime, sin, fault, or imperfection. He taught his disciples in praying to say, "Forgive us our debts," but he prayed not thus himself. He prayed in their presence, but not *with* them; nor did he *lead* them in prayer. Here then is one who believed himself sinless and perfect, and claimed as due to himself the confidence, reverence and submission of all men, and yet withal so meek, so gentle, so calm, so dignified, so benevolent, so self-sacrificing!

In his teaching he was at once simple and sublime. He is the one grand teacher of true religion and true morality. The sermon on the mount, the Lord's Prayer, the Golden Rule, and many of his sayings, for brevity, simplicity, comprehensiveness and depth of meaning, can be matched by nothing found in all human literature. As a teacher, both by example and precept, he confessedly has no equal among the moralists and philosophers; and the intelligent world acknowledges Him as a teacher sent from God.

Now Christ, as the divinely appointed teacher of the world in morals and religion, recognized the divine authority of the Old Testament Scriptures, and among these *the law*

(1) *Emile*, l. 4, p. 370.
(2) *Emile*, l. 4, p. 369.
(3) *Life and Works of Goethe*, by Lewes vol. 2, p. 307.
(4) *Vie de Jesus*, chs. 1,28.

that is, the Pentateuchal books. He spake as follows:

"And as touching the dead, that they rise, have ye not read in the book of Moses how in the bush God spake unto him, saying, I am the God of Abraham and the God of Isaac and the God of Jacob? He is not the God of the dead, but of the living. [1]—For had ye believed Moses, ye would have believed me; for he wrote of me. But if ye believe not his writings, how shall ye believe my words. [2]—They have Moses and the Prophets; let them hear them. * * * If they hear not Moses and the Prophets, neither will they repent, though one rose from the dead. [3]—These are the words which I spake unto you, while I was yet with you, that all things must be fulfilled which were written in the law of Moses and in the Prophets and in the Psalms concerning me." [4]

Thus Christ referred to and quoted the *book* of Moses, the *law* of Moses and the *writings* of Moses as a part of the Scriptures, and therefore as being divinely true and authoritative. That he so regarded the Scriptures is made evident by such declarations as these: "The Scripture cannot be broken. [5]—Ye do err not knowing the Scriptures. [6]—How then shall the Scriptures be fulfilled." [7] These and other similar declarations of Christ indicate that he regarded the Scriptures as possessing divine authority, and not only as true but as infallible. And He quoted and referred to the writings of Moses just as he quoted and referred to the other Scriptures. It is in evidence, then, that Jesus of Nazareth, the one sinless and faultless man, who regarded himself as "charged with a special, express and unique commission from God to lead mankind to truth and virtue," and who has been recognized accordingly by the enlightened portion of the human race as the world's divinely qualified and appointed teacher in morals and religion, regarded and treated the Pentateuch as containing a divine revelation and as possessing divine authority. All this implies that the Pentateuch, as well as the other Scriptures, makes known facts and ideas, the knowledge of which could not have been attained by the unaided faculties of the human mind. This applies to Genesis as well as to the other books of the Pentateuch, and to the 1st and 2d chapters of Genesis as well as to the succeeding chap-

(1) Mark 12:26-7.
(2) John 5:46,47. (3) Luke 16:31,2. (4) Luke 24:44.
(5) John 10:35. (6) Matt. 22:19. (7) Matt. 26:54.

ters. There is nothing to indicate that these opening chapters are exceptional, and that they are destitute of the divine element, i. e., the superhuman knowledge and the divine authority which the Great Teacher ascribes to the rest of Genesis and to the other books of the Pentateuch, and to the Psalms and Prophecies. On the other hand He expressly referred to and quoted the Mosaic account of creation as divinely true and authoritative, as follows: "Have ye not read, that He, *which made them in the beginning, made them male and female*, and said, *For this cause shall a man leave his father and mother, and shall cleave to his wife; and they shall be one flesh*? *Wherefore they are no more twain, but one flesh. What therefore God hath joined together, let not man part asunder.* [1] And again: "He saith unto them, *Moses because of the hardness of your hearts suffered you to put away your wives; but from the beginning, it was not so.*" [2] Thus Christ quoted Genesis 1:27 and 2:24 as historically true and divinely authoritative. He even claimed for these passages in the Mosaic account of creation as high authority as for the law of Moses itself.

Now the value of testimony depends on the character of the one who gives it. The witness in this case is Christ, who claimed to have an extraordinary commission from Heaven and called himself sometimes the Son of God, though oftener the Son of Man. It seems to be almost blasphemous to say that his testimony to the truthfulness of the Biblical account of creation and other Old Testament writings is *probably* true, since we regard him as Divine and Infallible. But if any one regards the testimony referred to as being only *probably* true, even he must regard the Biblical account of creation also as being probably true. Further he must regard the former probability as strengthening all the probabilities that precede it in our order of presentation.

We use the words hypothesis and probability in this connection for two reasons, one of which is that we are speaking of facts and arguments which, taken separately and singly, do perhaps produce only probability, and not absolute certainty; though these facts and arguments taken together do, as we think, produce certainty; and when combined with other evidences, internal and external, of superhuman intelligence and divine inspiration, they produce sufficient certainty to preclude all reasonable

(1) Matt. 19:4-6. (2) Matt. 19:8.

doubt. The other reason is that these facts and arguments, even if accepted as proving only probabilities, are sufficient to counter-balance, and more than counter-balance, the probabilities employed on the other side. We indeed believe that the facts above presented constitute a nearer approach to what logicians call moral certainty than all the arguments adduced in favor of Darwinism.

Take, as an example, the Darwinian argument drawn from the existence of rudimentary organs, divided, as they are, into two classes, the atrophied and minimized organs, and the nascent ones. The atrophied, rudimentary organs are supposed to have been possessed in full size and in useful condition by ancestral races. But this is a mere hypothesis, and the only evidence in its favor is that the hypothesis is supposed to be necessary to account for the existence of these organs in their present diminutive and useless form. Then this hypothesis, which, if at all better than a mere conjecture is only a probability, is employed to prove that the animals possessing these organs have descended from ancient races that possessed them in full and useful form. This hypothesis of descent is based upon the idea that the possession of these organs by living animals can be explained in no other way. Finally, this last hypothesis is employed to support the main Darwinian hypothesis, that all species, both of animals and plants, living and dead, have been derived from a few primordial forms, or more probably from one.

As to nascent organs, we have already shown that their existence, according to the principles of Darwinism, is an impossibility, since incipient organs must be utterly useless for the present. [1] But there are rudimentary organs that seem to be taking entirely too immense a period of time for disappearance by disuse and atrophy. Hence has been formed the hypothesis that such organs are not destined to disappear, but though useless now, are destined to be useful in the future. The only ground for this hypothesis is the notion that it alone satisfactorily accounts for the persistence of these organs in spite of the war which natural selection is supposed to make on everything that is injurious or useless to the possessor. The hypothesis amounts to this, that various species of animals are being prepared for some *future* environment by the appearance and growth of parts and organs useless in their present environment.

(1) Chap. 8.

And this somewhat rickety hypothesis comes in as a support, and even as a part, of the general hypothesis of evolution.

Take, as another example, the embryological argument. We have already pointed out the weakness of this argument.[1] But notice how it proceeds. First there is an effort made by some Darwinists to uphold the hypothesis that the human embryo, in its development, takes on the form and appearance of the embryos of the lower animals in general, from the lowest to the highest; and then this hypothesis is employed to uphold the hypothesis that man, in reaching his present condition, passed through all stages of existence, from the lowest to the highest. We showed, however, that the first hypothesis was rejected by Darwin and some of the most distinguished Darwinists. There remains the hypothesis, however, that the embryos of fishes, reptiles, birds, beasts and human beings are alike, because they *look* alike. And this hypothesis of *actual* likeness, founded on *seeming* likeness, is made the basis of this other hypothesis that all these animals, fishes, reptiles, birds, beasts and men, must have had a common descent, it being in reality assumed that the embryological likeness can be accounted for only by the hypothesis of common descent. Thus the argument is not only analogical, but hypothetical.

These are specimens of the hypotheses and probabilities involved in the Darwinian argumentation. We are far from saying that this argumentation is throughout without weight. But we claim that its weight is more than counter-balanced by the facts and arguments which we have above presented. Let us recapitulate:

1. There is *the character of the Hebrew cosmogony itself.*

How is it to be accounted for? Though it originated in an age of fables and myths, it is simple, clear, sober, straight-forward and truth-like; and it is admitted to be very truthful. Hæckel admired it for its clearness, sublimity and correctness. Professors Gray, Dana, Guyot, Parsons, Winchell, Dawson, and others, among the most competent and distinguished of modern scientists, testify that so far as they can see all its statements are scientifically correct. But how did this wonderful cosmogony which, thousands of years beforehand, anticipated the revelations of modern science, originate? How is it to be ac-

(1) Chap. 9.

counted for? It must have resulted, like every other phenomenon, from an adequate cause. But the unaided intellect of an ancient Jew or Jews is not a cause sufficient to account for the origin of this remarkable production called the Mosaic cosmogony. Yet, to speak after the manner of some Darwinian advocates, we must choose between this hypothesis and that of superhuman intelligence. These two are the only hypotheses in the case. But the former hypothesis is inadequate, since ancient Jews were incapable of anticipating the revelations of modern science. The only alternative is to accept the other hypothesis as a provisional and working one until something better shall have been suggested. This hypothesis furnishes an *adequate* cause; for certainly God could communicate superhuman knowledge to the author of Genesis. This hypothesis is quite ancient, a fact suggested by the oft repeated declaration that *God spake to Moses.*

2. This hypothesis and probability that the Biblical account of creation originated in supernatural knowledge are countenanced and strengthened by *the unparalleled excellence of the moral code of the ancient Hebrews.*

How did that code, summarized in the Decalogue and admitted to be faultless and perfect, originate? It originated, at some time, no matter when, among the ancient Hebrews, a somewhat rude and barbarous people. But how? Here again we seem to be shut up to one of these two hypotheses: that some ancient Jew invented the Ten Commandments or that they originated in superhuman knowledge. But it seems impossible that a narrow-minded and bigoted Hebrew, living away back in barbarous times, could invent a moral code that the whole enlightened world regards as faultless and as the work of God.

Hence for the present we must accept the hypothesis that the Decalogue is a gift of God to men. This is at least a possible origin and it is the one suggested in the Bible itself. "And the Lord said unto Moses, write thou these words." [1] But if God revealed the Decalogue to Moses, why would He not also reveal to Moses the way in which he created and fitted up the world?

3. *The excellence of the early Hebrew theology is another fact to be accounted for.*

As we have pointed out, the theological ideas inculcated in Genesis and the other books of the Pentateuch are

(1) Ex. 34:27.

unsurpassed anywhere and are equaled only in other parts of the Bible. The very best that the ablest theologians can now do is to reproduce the ideas concerning God contained in the Pentateuchal books. And these ideas concerning the unity, character and glorious attributes of God are maintained throughout the entire Scriptures, covering a period of fifteen hundred years, though polytheism, idolatry and abominable worship prevailed among all the other nations, and the Israelites themselves were continually falling into these errors and abominations. How are these phenomena to be accounted for? The provisional hypothesis of superhuman intelligence and a divine influence must be accepted.

4. The great excellence of certain parts of the Old Testament, especially of the Psalms, is another phenomenon which demands explanation. We have shown the unparalleled literary and moral excellence of these ancient lyrics by the testimony of Melanchon, Fenelon, Milton, Schlegel, Shedd, Tholuck, Lamartine, Bright and Gladstone. How came those ancient Hebrews, living in the dark ages, in this department of literature to beat the world? We must give the hypothesis of superhuman intelligence for an answer to the question or else give no answer at all.

5. Lastly the life and death, character and teaching of Jesus Christ suggest to most rational minds the hypothesis that he possessed superhuman intelligence and had a divine commission to teach mankind. As we have shown, the ablest sceptics of modern times, Rousseau, Goethe, Mill, Renan and others, when contemplating some of the striking facts brought to view in the Gospels concerning his life and character, seem almost ready to strike upon their breasts and to say, "Truly this was the son of God!" This great and holy one, this great teacher, whom the greatest sceptics have recognized as the Divine Man, as having lived and died like a God, as the one to whom the universal conscience has decreed the title of the Son of God, as one who really believed himself to have a special and extraordinary commission to teach truth and virtue to men,—this one referred to and quoted the Old Testament books, including the Pentateuch, as divinely true and authoritative. He also referred to and quoted the account of creation contained in Genesis as being divinely true and authoritative.

But the hypothesis that Jesus Christ possessed super-

human intelligence and gifts; that he had, as Mill says, a unique and special mission to teach mankind; and that, in some mysterious sense, he was, as he himself claimed to be, the Son of God—this hypothesis is necessary to explain the facts, and therefore must be held until the facts can be explained in some other way.

But, according to this hypothesis, the teaching of Christ was authoritative and infallible. His endorsement therefore of the Old Testament Scriptures proves them to be divine and true. By parity of reasoning, the Biblical account of creation in Genesis is proved to be divine and true; for the Master referred to and quoted it as such.

Thus these hypotheses support and strengthen one another. If superhuman intelligence is manifested at any of the points indicated, it creates a presumption of superhuman intelligence at every other point. And as each hypothesis is necessary to account for certain facts, and does account for them, each hypothesis taken by itself is probably true. As all the hypotheses sustain one another, when taken together, the probability becomes exceedingly strong, even overwhelming.

Taken by itself the fifth and last hypothesis has the strongest probability in its favor. The divine character and mission of Christ are necessary to account for the facts related concerning him in the Gospels, or to account for the Gospels themselves. But this last hypothesis, with the strong probability in its favor, supports all the others, and renders them probable in the same degree. The Biblical cosmogony is then just as certainly true as that Christ had a superhuman character and mission. The Biblical cosmogony being divine and true, it follows that the human race originated by the special creation of a single pair; that vegetable life began by special creation; that aquatic animals began by special creation, perhaps of a single pair of each species; and that terrestrial animals began in the same way. For each one of these points there are stronger proofs and probability than for the many hypotheses that figure in Darwinism.

CHAPTER XII.

BUT WHAT, IF AFTER ALL DARWINISM SHOULD PROVE TO BE TRUE? WHAT, IF THE THEORY OF SPECIAL CREATIONS IS TRUE?

I. We have expressed the belief that Darwinism is not proved, and is not likely to be. It is claimed, however, that the evidence in its favor is being constantly increased in the progress of investigation; and perhaps we ought as logicians to admit the possibility of the establishment of Darwinism, or of something like it, by such evidence as will preclude all reasonable doubt. If such should be the case, what will the effect be upon the religious beliefs of mankind? We do not think that the effect would be great. In case Darwinism were proved to be true, and were universally accepted, we presume that mankind would continue to believe in God, creation and providence, the Bible and teleology just as they do now.

1. In the first place, the theory of special creations and Darwinism; that is, Darwinism *somewhat modified*, may both be true. Existing species in general may have been derived from antecedent species, and yet the first man and the first woman have originated by special creation. As Darwin supposed, "The animals may have descended from at most only four or five progenitors, and plants from an equal or lesser number," those progenitors of course having originated by special creation. Even the hypothesis, "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] involves the theory of special creation. But the hypothesis of a few progenitors or primordial forms, as proposed by Darwin, more especially coincides with the theory of special creation. A few vegetable progenitors may first have originated at the beginning of the third age, when "God said,

(1) *Origin of Species*, p. 419.

Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind."

A few aquatic progenitors may first have originated in the fifth age, when "God said, Let the waters bring forth abundantly the moving creature that hath life." A few terrestrial progenitors may have come into existence in the sixth age, when "God said, Let the earth bring forth the living creature after his kind." [1] Or God may at first have called into existence a single pair of each species of aquatic animals and a single pair of each species of terrestrial animals, just as He at first created a single human pair. It seems at least that the animals at first were few in number; for though "God said, Let the waters bring forth abundantly," He also said to the first aquatic animals, as He afterward said to the first human pair, "Be fruitful and multiply and fill the waters in the seas, and let fowl multiply in the earth."

In thus suggesting the possible consistency of modified Darwinism with the theory of special creations, we propose nothing new. As we have shown, Drummond declares that "the attacks on the Darwinian theory from the outside were never so keen as are the controversies now raging, in scientific circles, over the fundamental principles of Darwinism itself." [2] He also suggests that there is nothing else for prudent men to do in the case than to *hold their judgment in suspense in regard to Darwinism and the factors and causes of evolution.*" [3] As we have shown, Romanes proposes modifications of Darwinism, and Le Conte proposes the virtual abandonment of it in order to save the general hypothesis of evolution. Dana accepts evolution, yet he declares the account of creation in Genesis to be divine, true and philosophical, and speaks expressly of "the creation of vegetation," "the creation of mammals," "and the greater work, totally new in its grandest element, the creation of man." [4] Prof. Winchell, who is ready to accept Darwinism with some qualifications, or at least does not oppose it, says: "For the time being I must believe that each organic type is a primordial, and not an indirect, creation." [5] Prof. Gray, who in a way accepts Darwinism, suggests that man's Simian descent cannot be accepted

(1) "After its kind" may mean according to its *nature*.
(2) *Ascent of Man*, p. 5 (3) p. 6.
(4) *Manual of Geology*, p. 849.
(5) *Reconciliation of Science and Religion*, p. 224.

until some monkey, live or fossil, is producible with great toes, instead of thumbs, upon his nether extremities; or until some lucky geologist turns up the bones of his ancestor and prototype who chipped out flint knives and arrow heads in the time of the drift, and wore his great-toes in the divergent and thumb-like fashion. He then declares expressly that "until some testimony of the sort is produced, we must needs believe in the separate and special creation of man, however it may have been with the lower animals and plants." [1]

The theory of special creation, as we have suggested it, has this to recommend it to evolutionists—that it would relieve them of several troublesome difficulties. If they would admit the intervention of God's creative power at the beginning of things, at the introduction of vegetable and animal life, and at the creation of man, they would not be under the necessity of resorting to the dogmas of spontaneous generation, and of supposing the evolution of life out of non-living matter equivalent to the production of something out of nothing, through natural means and forces; and they would also be relieved from the necessity of seeking after an intermediate animal to fill the large gap between man and the highest of the brutes.

2. Darwinism, even if proved and admitted, would not and could not destroy teleology or any of the theistic argument.

For in case Darwinism is true, natural selection is yet to be regarded merely as a natural law or secondary cause. If natural selection be a natural law, there must be a lawgiver and executor; for laws neither establish nor execute themselves. If natural selection be a secondary cause, then must there be a great First Cause, to which it and other secondary causes are subordinate. Teleologists and theists in general believe that God rules the world mainly through natural laws and secondary causes. Teleologists may therefore consistently be Darwinists, as many of them are.

As a matter of fact, animals and plants have originated, generation after generation, by derivation. Only the first man and woman, and the first generation of animals, came into existence by immediate creation, according to the prevalent belief and the theory of special creation. The countless multitudes of plants and animals have come into existence by descent or derivation, which is a kind of evo-

(1) *Darwiniana*, p. 92.

lution. But origination in this way does not exclude the idea of divine foresight and agency. God is as really the Creator of the later generations of men as of Adam and Eve. If then the genera and species of plants and animals in general have descended from antecedent genera and species, God is just as really their Creator as if He had created them immediately and separately.

Nor does derivative creation destroy the evidences of design. The eyes, hands and other organs of Adam's descendants, in the judgment of those who believe in special creation, manifest God's wisdom, skill and goodness just as effectually as did the organs of Adam himself. Nor do the exquisite, ingenious and wonderful adaptations and contrivances, which, it is admitted, abound in plants and animals, cease to be such because their possessors, as a matter of fact, originated by descent, or because their possessors belong to species that may have originated in the same way. The thought, foresight, wisdom and intention, displayed by these adaptations and contrivances cannot be in *natural selection*, which is a blind force or a mere mode of operation, and has neither thought, foresight, wisdom nor design.

The fact that the adaptations and contrivances are manifested in plants and animals, that were preceded by many species of varied and ascending grades, does not alter the case. Our huge war ships and ocean steamers manifest in their construction thought, foresight and design none the less because they were preceded by multitudes of vessels of ascending grades from the skiff and the ferry-boat. Nor are the skill and design manifested in the construction of ships, watches and machines in the least diminished by the *time* employed in their construction.

3. As we have said, *many Darwinists accept the argument as legitimate and valid.* Darwin himself, at the time he wrote his greatest work, was a teleologist and believed in God as the Creator and Ruler of the world. He speaks of God as the author of natural laws and secondary causes, thus: "To my mind it accords better with what we know of the laws impressed on matter by the Creator, that the production and extinction of the past and present inhabitants of the world should have been due to the secondary causes, like those determining the birth and death of the

individual."[1] Even afterward, when he was the farthest gone in agnosticism, and (as he himself said) his brain was atrophied and the reading of Shakespeare had become nauseating to him, he did not get rid of teleology. He was (to use his own expression) in a hopeless muddle on the subject, but, as he himself confessed, at times teleological views and evidences came upon him with overwhelming force.

Spencer is no teleologist, but he maintains that the hypothesis of evolution, as well as that of special creations, "implies a cause," and that the advocates of the latter are mistaken in thinking that it "honors the Unknown Cause of things" more than the former. He suggests also that the derivative creation of species serves just as well to demonstrate divine power as the derivative creation of individuals. In sneering terms he speaks of what he is pleased to call "the artificial, vulgarly supposed method of the formation of the universe" and "the mechanical God of Paley," and claims that the nebular hypothesis "implies a First Cause much more exalted." [2] Though Spencer goes as far as he can in the attempt to reduce the idea of God to a mere abstraction, an unknown Power without personality or attributes, yet, after all, his hypothesis of evolution can not get along without a God behind and in the forces and principles, development and progress which figure so largely in his philosophy. We have shown [3] that Le Conte declares: "There is design in everything."[4] Even Fiske declares: "The whole scheme was teleological, and each single act of natural selection had a teleological meaning." [5]

Other Darwinists are not only more outspoken in the expression of teleological views, but also declare their acceptance of the argument from design. Prof. Winchell, of Michigan University, is a Darwinist, so far at least as to declare that his "conviction is that the doctrine of the derivation of species should be accepted." [6] He is nevertheless a teleologist. He affirms that "the world is full of instances of intentionality;" and that "in every effect where intention is manifest, mind is implied." He declares the

(1) *Origin of Species*, p 423.
(2) *Universal Progress*, p 299.
(3) See chap. 10. p. 581.
(4) *Evolution*, &c. p. 573
(5) *The Idea of God*, p. 161.
(6) *Recon. of Science and Religion*, Pref. p. 5.

argument as presented by Paley to be valid and imperishable.[1]

Prof. Gray, of Harvard University, a Darwinist in his way, says: "We could not affirm that the arguments for design in nature are conclusive to all minds. But we may insist, upon grounds already intimated, that, whatever they were good for before Darwin's book appeared, they are good for now. To our minds the argument from design always appeared conclusive of the being and continued operation of an intelligent First Cause, the Ordainer of nature; and we do not see that the grounds of such belief would be disturbed or shifted by the adoption of Darwin's hypothesis." [2]

4. Finally, the question may be asked, whether the universe, even if called into being by the creative power of God, may not now be self-sustaining and self-regulating. It may be maintained that the more nearly perfect a machine is the less need will it have of superintendence and regulation. If, then, an absolutely perfect machine were constructed and once set a-going, would it not run on forever without supervision or aid? It may then be asked, according to the teleological and theistic view, ought not the universe to be absolutely independent, and to be entirely self-sustaining and self-regulating, so that, in the sarcastic language of Carlyle, all that God has now to do is to sit outside of the universe and see it go?

In opposition to this hypothesis, it is to be observed:

(1st.) It is not in evidence that, in the nature of things, *any created thing can be independent of its Creator.*

(2d.) It is not known that any created thing can be self-sustaining. For all that men can know, if the sustaining power of God were withdrawn, every created thing, the whole universe, would return at once to nothing.

(3d.) Even if it were possible in the nature of things that a created thing might be independent of its Creator, and be self-sustaining and self-regulating, it does not follow that an infinitely wise, holy and benevolent God ever has or ever will create such a being.

(4th.) As a matter of fact, the larger, more powerful and more complex a machine is, the more knowledge, skill and power are required for its management. A very weak and ignorant man may run a wheel-barrow, but it requires a

(1) *Recon. of Science and Religion*, pp. 150-7-9.
(2) *Darwiniana*, p. 152.

good deal of strength and skill to run a locomotive. Almost any one can paddle a canoe, though even that requires some acquired skill. But the strength and skill of many men and even many machines, must be employed in the management of the huge ocean steamer. What knowledge, skill and power, then, must it require to manage this huge universe, almost infinitely complex and embracing as parts of itself all forces and machines! Does some one suggest that the universe is governed by laws? We answer, yes; but laws must not only be established, but also be executed.

(5th.) Machines not only require superintendence and regulation, but their parts wear out and must be repaired or replaced.

Something analogous to this takes place in nature. The human body wears out and ceases to operate. Thus it is also with the bodies of the lower animals. Injuries from wounds and the wear and tear from abuse are to a certain extent repaired. But in the end, if life continues long enough, every animal body wears out and ceases to operate. In such cases repairs are out of the question, and new machines must be introduced. This is a type of what is going on in the universe everywhere, so far as we can judge. The sun itself is continually giving out light and heat, and as it is finite in extent, its resources must in time be exhausted, unless there is from time to time a re-supply of wasted material. Hence some scientists have predicted a freezing time in the far distant future. Thus throughout the universe, as far as we can know, there are wear and tear, waste and breakage, making repairs and replacements necessary. For these reasons the universe, like a piece of human machinery, must have not only a Maker, but an Upholder, Regulator and Repairer.

II. But if the theory of *special creations* is true, what then? The acceptance of this theory is certainly not likely to produce any disastrous results. It has been accepted and earnestly believed, and is still earnestly believed, by very large numbers of intelligent people and of able, learned and scientific men, without injury to themselves or others. There are several considerations which recommend it.

1. The theory of special creations is set forth in the first chapter of Genesis. It is the prevalent belief among intelligent people and of the most learned, ablest and best of

men, and has been for about eighteen centuries, that the Bible is in some sense the book of God. Only by this fact, or as some would call it, hypothesis, can be accounted for this grand, old book, wonderful in its literary character, its moral code, its influence and effects. Its account of creation contains truths which could not be known nor understood in ancient times by unassisted human reason. As we have shown, that able and accomplished scientist, Prof. Dana, pronounces this account of creation "profoundly philosophical" and declares that "it is a declaration of authorship, both of creation and the Bible, on the first page of the sacred volume." [1] But the account of creation in Genesis, by its manifestation of supernatural intelligence, attests not only the divine authorship of the Bible, but also the doctrine of special creations; for this doctrine is prominent in the first chapter of Genesis. Indeed all the evidences, external and internal, which we have to prove that the Bible contains supernatural revelation, are indirectly evidences in favor of special creation. For, if the Bible is the book of God, it is highly improbable, if not altogether incredible, that its divine author would allow a false doctrine to appear in its first and most prominent part. Hence every argument in favor of the divine inspiration of the Scriptures serves equally well to prove the theory of special creation.

2. Another thing that recommends this theory is this, that its acceptance *obviates the need for that unphilosophical and unscientific dogma, the hypothesis of spontaneous generation.*

We have shown [2] that Hæckel, followed by Huxley, and Spencer followed by Fiske, have found it necessary to resort to this hypothesis to account for the origin of things. Even Prof. Le Conte, after condemning those whom he calls "extreme evolutionists (such as Dr. Bastian and Prof. Hæckel) and nearly all anti-evolutionists, for imagining that the truth of evolution and that of spontaneous generation must stand or fall together," immediately turns round and affirms that though abiogenesis is *now* a false doctrine, it was not always so, but that spontaneous generation did once occur in the history of the earth. [3] Darwin avoided all such notions, at least in his greatest work, be-

(1) *Manual of Geology*, p. 850.
(2) See Chap. V.
(2) *Evolution and its Relation, etc.*, p 15.

cause at the time of its production he believed in God and ascribed to him the *creation* of primordial forms. Had he not believed that "the first creature was created," [1] he too might have attempted to bridge the chasm between non-living and living matter, by propounding the hypothesis of spontaneous generation, involving the notion that a change may occur without an adequate cause, or without a cause at all.

3. The theory of special creations obviates the necessity for the impossible and absurd hypothesis that the number of species has increased from one (or at most from a few) primordial forms to ten millions dead and living, while but few species at any one time are changing, and most are stationary. That theory avoids also the self-contradictory supposition that species have increased from one, or at least from a very few species, to two millions now living, while yet comparatively few have been transmuted and the great majority have become extinct without leaving descendants of any kind. [2]

4. This theory accounts for the gaps, chasms, and abrupt transitions, "astounding breaks," as Prof. Dana calls them, presented in the geological record. It obviates the necessity for supposing, as Darwin did, imperfections and non-comformity in that record in many places, where, according to Le Conte and other geologists, such non-conformities and imperfections do not exist. It also obviates the necessity for the hypothesis of *rapid and paroxysmal evolution* as propounded by Le Conte, but rejected by Darwin and most of the Darwinists, who maintain that nature makes no abrupt advances—*Natura non facit saltum.* It explains why, again and again, as indicated by the fossiliferous strata, full-formed species have suddenly appeared, and, after longer or shorter duration, just as suddenly disappeared.

5. The theory of special creation explains why every species is perfect in its kind—why there are no half-formed species, no transitional forms.

6. This theory accounts for the origin of vegetable life, by the divine fiat and creative evolution from the earth; for the origin of aquatic life, by the divine fiat and creative evolution from the water; for the origin of land animals in general, by the divine fiat and creative evolution from the land; for the origin of the human body, by the divine fiat

(1) *Origin of Species*, p. 422.
(2) See chap. 8, sec. 4.

and creative evolution from the dust of the ground; and for the origin of the human soul as a living and animating spirit, infused by the inspiration of the Almighty.

7. This theory accounts for the instincts, skill and habits of bees, ants, birds, and other animals—wonderful instincts, skill and habits, which continue through thousands of years without change either in advancement or retrogression.

8. This theory accounts for the immense difference between man and even the most intellectual of the lower animals; and why the much desiderated intermediate links in the zoological chain have not been found nor are likely to be.

9. This theory explains why man alone of all the higher animals is without any natural covering for his body.

10. This theory explains why man, though naturally the most defenseless and helpless of all the higher animals, is the master of the earth, and, as can be said of no other animal, is the inhabitant of every zone.

Thus the doctrine of special creations appears to be encumbered with fewer difficulties and to explain more facts than the Darwinian hypothesis; and, therefore, on grounds of common sense and logic, and aside from the teachings of Scripture, is to be preferred.