6-1-1953

Pre-Darwinian Interpretations of the Concepts of the Origin of Life, Variation, and Survival of Characters

Daniel DeBlock Jr
Concordia Seminary, St. Louis, ir_deblockd@csl.edu

PRE-DARWINIAN INTERPRETATIONS OF THE CONCEPTS OF THE ORIGIN OF LIFE, VARIATION, AND SURVIVAL OF CHARACTERS

A Thesis Presented to the Faculty
of Concordia Seminary, St. Louis,
Department of Philosophy
in partial fulfillment of the
requirements for the degree of
Bachelor of Divinity

---

by

Daniel DeBlock, Jr.

June 1952

Approved by: Paul M. Bretscher
Advisor

F. E. Mayer
Reader

TABLE OF CONTENTS

CHAPTER I

THE IMPORTANCE OF THE CONCEPTS OF THE ORIGIN OF LIFE, VARIATION, AND SURVIVAL OF CHARACTERS

The individual developments of the concepts of the origin of life, variation, and survival of characters have given birth to many theories of organic evolution. Moreover, these concepts, as they were extant in the first half of the eighteenth century, greatly influenced Charles Darwin,[1] whose Origin of Species greatly popularized and gave new life to evolutionistic speculation. Since Darwin's day organic evolution has gained in popularity until the term has become a common word to countless numbers of people, and until millions of people believe in a theory of evolution in one form or another. Hence, it is important that the above concepts and their individual developments be studied.

Definition of Organic Evolution

Since the topics under discussion all deal with organic evolution, it is necessary to examine the term and to see exactly what it implies. The Encyclopedia Britannica defines the term as "...a process of cumulative

---

[1] H. F. Osborn, From the Greeks to Darwin, (New York: The MacMillan Company, 1913), p. 229.

change."[2] This definition is extremely general and gives little indication as to the exact meaning of the term. This would seem to indicate the validity of the contention of Theodore Graebner[3] that it is impossible to define organic evolution. He maintains that there is such a complexity of contrasting theories that all evolutionists could not agree on one single definition.[4] He asserts that although it is not a definition the meaning of the theory may be described in this manner:

> ....The theory asserted that plants and animals will develop a variation which was not found in the parent, and that this persists and is transmitted to offspring until it produces a new variety of plant or animal. This variety continues to become more pronounced until its differentiating features justify one in calling it a new species.[5]

Hence, Doctor Graebner recognizes that in its modern sense evolution eventually implies the development of a new and different species out of an old species. This view is supported by the definition found in Webster's Collegiate Dictionary:

> ....The development of a race, species, or other group; ...broadly, the process by which, through a

---

[2] "Organic Evolution", Encyclopedia Britannica, (1951 edition; Chicago, London, Toronto: Encyclopedia Britannica Inc., 1951), VIII, 995.

[3] Theodore Graebner, God and the Cosmos, (Grand Rapids: William B. Eerdmans Publishing Company, 1932), pp. 215-6.

[4] Ibid.

[5] Ibid., p. 216.

series of changes, any living organism or group of organisms has acquired the morphological and physiological characters which distinguish it; hence, the theory that the various types of animals and plants have their origin in other preexisting types, the distinguishable differences being due to modification in successive generations.[6]

Importance of Concepts to the Theories of Evolution

Although already in the period of the Greek philosophers men conceived of higher forms of animals developing out of lower forms,[7] many contributors to the concepts under discussion did not, however, attempt to construct a theory of the origin of species.[8] H. F. Osborn frequently calls attention to contributors who were not at all aware of such a theory, or, if they were, they were either antagonistic to it or simply refused to accept it. For example, although his father, Geoffrey St. Hillaire (1772-1844), believed in the mutability of species, Isadore St. Hillaire (1805-1861) refused to accept it on rational grounds.[9] Nevertheless, Isadore was aware of the concepts under discussion and made his own contributions to them.[10]

---

[6] Webster's Collegiate Dictionary, (Fifth edition; G. and C. Merriam Co., 1947), p. 346.

[7] Osborn, op. cit., p. 15.

[8] Ibid., passim.

[9] Ibid., p. 207.

[10] Ibid.

Consequently, investigation of these concepts did not necessarily lead all scientists and thinkers prior to Darwin to the conviction that the mutability of species was a valid proposition.

On the other hand, these concepts and their development form the foundation of modern evolutionary thought,[11] and it is of importance to point out how each of these concepts fits into the framework of evolutionary thought.

A basic principle of all evolutionary theories is natural causation. This attempts to eliminate, or at least place into the background, any interferance with, or control of nature by a supernatural being.[12] It attempts instead to interpret the phenomena of nature according to the sole operation of natural laws. It is with respect to the origin of life that this principle has been most violently debated. Many attempts have been made to establish this principle of natural causation. But attempts have also been made to establish the principle of divine causation. Still other attempts have been made to resolve the tension existing between these two principles. These attempts have resulted in the emergence of many concepts of the origin of life.[13]

---

[11] Ibid., pp. 1-4.

[12] Ibid., p. 20.

[13] Osborn, op. cit., passim.

Also the phenomenon of the existence of variations is central to organic evolution. In support of his theory Charles Darwin points out the variation of form existing in both domesticated and undomesticated plants and animals.[14] By variations Darwin means differences in "...size...color...thickness of skin and hair...etc."[15] Many men have attempted by speculation or investigation to find out why these variations occur. This has resulted in many theories of evolution.[16] Also, Osborn points out that one of the most important steps in the development of evolutionary thought was the directing of observation to variation for, as has been seen above, the mutability of species is central to organic evolution, and eventually the mutation of species has been contended to be the result of the accumulation of variations.[17][18]

Naturally, if the accumulation of these variations is to result in new forms or species, evolutionists must be able to account for the methods by which the variations will survive in later generations. This they have tried to

---

14 Charles Darwin, Origin of Species, (New York: J. A. Hill and Company, 1904), p. 5., pp. 34-37.

15 Ibid., p. 6.

16 Osborn, op. cit., passim.

17 Ibid., p. 88.

18 Osborn, Ibid., p. 88.

do through the application of theories of heredity and theories of selection. Heredity deals with "...the transmission of the physical and psychical characters of parents to their offspring."[19] Little specific thought was given to this problem prior to Darwin, but the concepts arrived at were of importance.[20] On the other hand, much work was done with the concept of selection which deals with "...any process, natural or artificial, which tends to result in preventing certain individuals or groups of organisms from surviving and propagating, and in allowing others to do so."[21]

Thus it is evident that each of these three concepts: the origin of life, variation, and survival of characters, are important to the theories of organic evolution. The concept of the origin of life is important because it is the concept which brings to light the importance of the premise of natural causation, and because the conflict between this premise and the premise of supernatural causation has resulted in the formulation of many evolutionary theories. The concept of variation is important because the attempt to account for the varying forms existing within species has resulted in various theories of evolution,

---

19 Webster's Collegiate Dictionary, op. cit., p. 466.

20 Osborn, op. cit., passim.

21 Webster's Collegiate Dictionary, op. cit., p. 802.

and because evolutionists believe that through the accumulation of these variations new species develop. And the concept of survival is of importance because by means of it evolutionists attempt to show how these variations are propagated, and why they persist until their accumulation results in a new species.

Importance of Concepts to a Theologian

For various reasons evolutionary theories are attractive to men.[22] Millions have and still are embracing such theories with religious fervor and zeal.[23] Since these theories emphasize natural causation at the expense of supernatural causation, the one believing in such a theory tends to limit, if not rule out, his belief in God's power over nature and himself. The only value the evolutionist sees in religion is that it deals with the relationships existing among men. For him religion has only social significance.[24] Thus it can be seen why theories of evolution and their development are of importance to the

---

[22] Theodore A. Martin, "Bearing of Theory of Evolution on the Doctrine of Man," (Unpublished Bachelor's Thesis, Concordia Seminary, St. Louis, 1939), p. 15.

[23] William Cecil Dampier, A History of Science and its Relations with Philosophy and Religion, (New York: MacMillan Company, 1946), p. 301.

[24] Ibid., p. 334-9.

Christian theologian. For he is concerned with pointing out to men the infinite power that God has and exerts over all things.[25]

Since the concepts of the origin of life, variation, and survival of characters form the framework of most evolutionary thought the theologian must carefully examine each of these concepts. He must determine whether the evolutionist correctly interprets these concepts. He must inquire whether the evolutionist has enough evidence to support his interpretation of these concepts. In other words, the theologian must inquire whether the evidence at hand necessitates a naturalistic interpretation of these concepts, or whether some other interpretation is necessary or possible. Above all, the theologian must also ask himself whether his view of supernatural causation necessarily leads to his interpretation of these concepts. If it does, he must show how it does.

In tracing the development of these concepts prior to Darwin it will be possible to test their validity, to note various possible interpretations of them, and to get a clearer picture of the implications that result from their various interpretations.

---

[25] John Theodore Mueller, Christian Dogmatics, (St. Louis: Concordia Publishing House, 1934), p. 173.

CHAPTER II

CONCEPTS OF THE ORIGIN OF LIFE

Special Creation Concept

The earliest record of the origin of life that has been of lasting influence, even to the present day, is the Mosaic account of creation which is found in the book of Genesis. Even learned evolutionists are always ready to acknowledge the great influence this concept has had and will have on man's thinking.[1]

The account states that God created all things in six days.[2] On the first two days God created the world and light. The third day saw the creation of all plant life. On the fourth day the sun, the moon, and all celestial bodies were created. It is interesting to note that this order of creation seems unreasonable to the evolutionist, as it places the origin of plant life before the origin of the sun. Since plants are dependent on the sun for the manufacture of their food, the evolutionist claims that this order of creation is impossible.

---

[1] Erie Nordenskiold, The History of Biology, translated from the Finnish by Leonard Bucknall Eyre, (New York: Tudor Publishing Co., 1928), p. 6.

[2] Genesis 1:1-28.

According to the Mosaic account, creation continued with the creation of marine animals and birds on the fifth day. God ended Creation on the sixth day with the creation of the land animals and man.

Although, as we shall see, many have tried to adapt this account to an evolutionary theory, a literal interpretation of Genesis makes such an adaptation quite difficult for many reasons. First, there is no evolutionary order in this account, that is, lower forms were not created first and higher forms of life later. But rather, lower forms were often created after the higher forms. For example, whales were created before the creeping things.[3] Secondly, one of the most generally accepted views amongst evolutionists as to the origin of life states that life originated in water.[4] The Mosaic account states that land-plant life was first created.[5] Many other reasons can be given that show the difficulty of adapting the Genesis account to a theory of evolution. The greatest difficulty, however, in the Genesis account is that the account makes God the author of all things. He not only supervised the formation of all living plants and animals, but He was their creator.

---

[3] Genesis 1:21,24.

[4] H. F. Osborn, From the Greeks to Darwin, (New York: The MacMillan Company, 1913), p. 33.

[5] Genesis 1:11.

At His command they sprang into being at once.

On the other hand, evolutionary theories minimize God's activity in the origin of life. Although some of the early churchmen proposed different interpretations of the Mosaic account,[6] generally speaking, after the church came into power the literal meaning of Genesis 1 was accepted as the correct view of the origin of all living things. Most thinkers and scientists looked upon the Genesis account as being absolutely correct, and believed that all existing species had their origin in the first six days of creation.[7] Some of the later scientists of note who held to this view even when evolutionary theories were coming into vogue were John Ray (1627-1705),[8] Linnaeus (1707-1778),[9] Georges Cuvier (1769-1832),[10] and Isedore St. Hillaire (1805-1861).[11]

One of the major problems that faced the adherents of the Mosaic account was the evidence of variation of forms within a species and the existence of species that could

---

[6] Osborn, op. cit., passim.

[7] Ibid.

[8] Nordenskiold, op. cit., p. 210.

[9] Ibid.

[10] Osborn, op. cit., p. 195.

[11] Ibid., p. 206.

be classified as occupying a position halfway between two other species. Therefore, many later scientists who believed in the Genesis account of Creation introduced into it some modifications. Their views will be discussed below.

Aristotelian Concept

The second explanation of the origin of life that has been of lasting importance in influencing man's ideas can be said to have originated with Aristotle (384-322 B.C.). Aristotle believed that life originated through spontaneous generation[12] from lifeless matter. According to Aristotle, spontaneous generation did not, however, occur by accident. Behind it was the moving force of God.[13]

According to Will Durant, Aristotle's view of God was panthelstic. He suggested that the whole of nature and all existence was God. The one major attribute of this God is motion, and so nature too is in motion. This motion in nature and in God is directed toward perfection. Hence, inorganic matter strives to become organic.[14] This internal striving for perfection is not confined to inorganic

---

[12] Nordenskiold, op. cit., p. 41.

[13] Osborn, op. cit., pp. 50, 51.

[14] Will Durant, The Story of Philosophy, (New York: Garden City Publishing Co., Inc., 1943), pp. 56-58.

matter but persists in organic matter also.

Aristotle limited spontaneous generation to the lowest forms of life. He pictured life as originating as a small, minute germ.[15] This germ, possessing the internal perfecting principle, through later generation developed into higher forms of life, until man, the highest point of ascent, was reached.[16] In this ascent the various species of animal and plant life were attained.

Spontaneous generation, however, is not limited to any specific period in history. It continues throughout history and is not always limited to germs.[17] Even such highly specialized forms such as flies and mosquitoes are spontaneously generated.

The important points in Aristotle's views regarding the origin of life are the following. First, there is Design or Purpose in nature. Nothing happens by accident. Secondly, life originated spontaneously from inorganic matter as a result of the internal activity of this design. And thirdly, the higher forms of life developed from lower forms of life as a result of this same internal perfecting principle.

---

15 Osborn, op. cit., p. 56.

16 Ibid., p. 42.

17 Nordenskiold, op. cit., p. 41.

Aristotle's influence on later thought was exceptionally great. Many men took over his general views and adapted them to their own ideas. Among them were many churchmen. The most prominent was St. Augustine (352-430) who taught in some of his statements a naturalistic interpretation of Genesis. He considered the six days as comprising six periods of time during which spontaneous generation and Aristotelian Evolution took place.[18] He substituted the Christian God for the Aristotelian concept of God as a moving force in creation.[19]

H. F. Osborn lists some of the prominent churchmen and scientists who adopted Augustine's general synthesis of the Genesis account and Aristotelian Evolution. They are Gregory of Nyssa (231-396), John Scotus Erigena (800), Thomas Aquinas (1226-1274), De Maillet (1656-1738), Erasmus Darwin (1731-1802), J. B. Robinet (1735-1820), Robert Chambers (1802-1877), and Richard Owen (1810-1892).[20] Weber also includes Giordano Bruno (1548-1600), Spinoza (1632-1677), and Hegel (1770-1831).[21]

---

18 Osborn, op. cit., p. 70-74.

19 Ibid.

20 Ibid., passim.

21 Alfred Weber, History of Philosophy, translated by Frank Tilly, (New York: Charles Scribner's Sons, 1925), passim.

These men all felt that the Christian God brought about life spontaneously from inorganic matter as a germ cell, and that the higher forms were later evolved through the operation of an internal perfecting principle. They did not feel that they were limiting God's power by accepting these concepts. Their view is probably best expressed by Erasmus Darwin, who said:

> ....For if we compare infinities, it would seem to require a greater infinity or power to cause the causes of effects, than to cause the effects themselves; that is, to establish the laws of Creation rather than to directly create.[22]

The famous scientist Lamarck (1744-1829) believed in spontaneous generation occurring under the guidance of God, but he did not believe that evolution proceeded because of an internal perfecting principle.[23] His views will be discussed more fully in the next chapter.

A few words must be said as to how these men pictured the germ cells. Aristotle and most of his followers believed that spontaneous generation took place simply as a result of the operation of the internal perfecting principle which is present in all forms of inorganic matter. As a result, they believed that these germ cells were not all identical to one another. Therefore, the higher forms

---

[22] Ibid., p. 148.

[23] Ibid., p. 163.

evolved from one germ cell would not resemble the forms evolved from another.[24] One germ cell might give rise to bushes and another to trees, et cetera. It was not until 1851 that the belief first arose in evolutionary circles that all life was derived from one single primordial cell. Charles Darwin claimed that his contemporary, Dr. Freke, originated this idea.[25]

Anaximander's Concept

Anaximander (610-540 B.C.) had views similar to those of Aristotle, but several differences must be noted. He pictures life as originating from a primordial element which is neither organic nor inorganic. This primordial element was uncreated. It is in reality the supreme divinity, possessing a vitality of it's own. It has always existed and always will.[26]

Anaximander adds a rather intriguing thought when he said that universes have preceded this universe. They sprang, he said, from the primordial element and returned to it again.[27]

---

[24] Osborne, op. cit., passim.

[25] Charles Darwin, Origin of Species, (New York: J. A. Hill and Company, 1904), p. xl.

[26] Weber, op. cit., p. 11.

[27] Nordenskiold, op. cit., p. 12.

Charles Bonnet (1720-1793) closely followed Anaximander's view. He attempted, however, to adapt it to the Christian view. He pictured the primordial element as indestructible germs which are, however, not divine. Out of these germs higher forms have evolved. Catastrophies have occurred in the past which have annihilated all life except these germs. After each catastrophe the process of evolution takes place all over again, but the higher forms of each new period of evolution do not completely duplicate the higher forms of previous periods. Thus he attempted to explain the unusual forms of fossil plants and animals.

He pictured the Genesis account of creation as the latest evolvement of higher forms out of the germ cells under God's guidance.[28] In this way he attempted to adapt his theory to the general Christian beliefs on the subject of Creation.

Empedocles' Theory

Empedocles (495-435 B.C.), considered by many to be the father of the evolution idea,[29] pictured life as arising because of the struggle between two conflicting moral forces; love, the unifying force; and discord, the

---

[28] Ibid., pp. 244-246.

[29] Osborn, op. cit., p. 37.

principle of separation.[30] Since these two factors were both operating simultaneously and were antagonistic to each other, there could be no definite plan in the evolvement of living things. Empedocles imagined that the evolvement of living forms was controlled entirely by chance.

Instead of picturing life as arising as fully formed organisms, Empedocles felt that life first arose as separate organs such as arms, legs, roots, heads, torsos, et cetera.[31] These organs tended to unite, but they united in a rather haphazard manner.[32] An animal torso might possibly unite with plant roots, a human head with a lion's torso and legs, et cetera. Obviously, these monstrosities had little hope for survival. Therefore, they soon died out. But combinations did occur, entirely by chance, which could survive. These are the forms which persist in nature today.

The concept of chance as the controlling factor in the origin of life and the various forms of animals has time and again been influencial in evolutionary thought. It is, in fact, one of the most prominent views of modern evolutionary thought.[33]

---

30 Weber, op. cit., pp. 28,29.

31 Osborn, op. cit., pp. 37-41.

32 Ibid.

33 Ibid.

Naturalistic Concepts

As has been noted, one of the main questions involved in the theories of the origin of life is to what degree was God operative in the origin of life. In most of the above theories, the authors attributed considerable influence to God in the origin of life. However, theories regarding the origin of life had already arisen prior to Charles Darwin which greatly limited or excluded the operation of such a God.

Rene Descartes (1596-1650) pictured the material world as a machine in which all things occur as a result of mathematical necessity.[34] This includes the origin of life from lifeless matter. He recognized that God exists and that he had a hand in the origin of the mathematical laws that controlled the origin of life, but he revolted from seeking final causes and felt that theology and nature should not be confused. Hence, his view of nature was definitely one which excluded God.[35]

Leibnitz (1646-1716) believed that God was the author of all things, but he said that God was bound by laws which He could not violate or unmake.[36] Therefore, Leibnitz like

---

[34] Weber, op. cit., p. 251.

[35] Ibid.

[36] Ibid., p. 293.

Descartes, pictured God as operative in the origin of life, but bound by necessity. This view definitely associated these philosophers with Democritus (460-320 B.C.), who in his Atomic Theory definitely sets forth the proposition that all things, including the origin of the universe and life happen by necessity rather than by accident or intention.[37]

Francisco Redi

Most of the concepts discussed above set forth a belief that life originated by means of spontaneous generation. By the seventeenth century belief in spontaneous generation was widespread. It was even believed that higher forms such as mice and rats were generated from old rags and paper. One of the proofs set forth for spontaneous generation was the fact that when the flesh of dead animals was left standing it was soon covered with grubs and maggots. Francisco Redi (1626-1679) cast serious doubt on the belief in spontaneous generation by showing that if insects were kept from the dead animal, no grubs or maggots appeared.[38]

However, Redi's work did not completely destroy the

---

[37] Nordenskiold, op. cit., p. 21.

[38] William Cecil Dampier, A History of Science and its Relations with Philosophy and Religion, (New York: Macmillan Company, 1946), p. 201.

belief in spontaneous generation. In the nineteenth century men like Vogt and Haeckel caused much dispute by upholding the belief that spontaneous generation is the naturalistic explanation of the origin of life.[39] And even today, men like R. S. Lillie are attempting to show how spontaneous generation can occur.[40]

---

[39] Ibid.

[40] R. S. Lillie, General Biology and Philosophy of Organism, (Chicago: University of Chicago Press, 1945), pp. 11-16.

CHAPTER III

Concepts of Variation

The fact that there are many varieties of plants and animals in the world of nature has caused naturalists much concern. By varieties we mean organic individuals that differ from the norm or standard form that their particular species ordinarily exhibits. Actually every organic individual, whether plant or animal, varies from every other individual in its species. Hence, there are no two human beings that are exactly alike. They differ from one another as to height, weight, hair color and texture, eye color, skin color and texture, et cetera. Often a group of individuals has certain variations in common that set them apart, as a group, from other members of their species. Among humans we have three such groups or stocks that have characteristics peculiar to each group: the black skinned Negroid, the white skinned Caucazoid, and the yellow skinned Mongoloid. Even within these three stocks there are other groups that bear certain peculiar characteristics demanding separate classification.

This phenomenon of variation pervades nature. The attempts to find the reasons for it have resulted in many theories of variation. The formulations of these theories have invariably been largely influenced by the philosophy

of nature the formulator was seeking to strengthen.

But before discussing these theories it will be necessary to discuss the development of the concept of species, because the concept of species is one of the focal points around which the various theories revolve.

The Concept of Species

Prior to the middle of the eighteenth century there were two distinct schools of thought in regard to the concept of species.[1] The one school preferred to look at nature as a unity and resented any attempt to break it up into species, and thus set a boundary line between two forms which in many respects resembled one another. Representatives of this school thought of all forms as being essentially alike and following a certain pattern. The other school of thought preferred to think of nature as being divided into certain groups and classes in which the classes might resemble one another, but were essentially different.

Aristotle held to the former view. He saw a complete gradation in nature with the lower forms blending into the higher forms.[2] This view was also taught by such men as Charles Bonnet (1720-1793) and Leibnitz (1646-1716).

---

1 H. F. Osborn, From the Greeks to Darwin, (New York: The MacMillian Company, 1913), Passim.

2 Ibid., p. 48.

Bonnet rejected any view that set up lines between species and pictured all forms as passing into one another. He thought of nature, both organic and inorganic, as a series of forms running in a straight line from the simple elements through the minerals, through the vegetable and animal kingdoms to man. Like all Aristotelians, he pictured man as the highest form in nature.[3] Concerning this view of nature, H. F. Osborn quotes Leibnitz as saying:

> ....All natural orders of being present but a single chain, in which the different classes of animals, like so many rings, are so closely united that it is not possible either by observation or imagination[4] to determine where one ends or begins.

The other school of thought concerning species originated with John Ray (1627-1705).[5] He set up two criteria for species: 1. permanence of form and appearance, 2. nonfertility with other species. This school of thought held that certain characteristics of form and appearance always passed from parents to offspring. These characteristics, so this school believed, easily distinguished one species from another species. These men also held that one species could not produce offspring by mixing with another species.

---

3 Eric Nordenskiold, The History of Biology, translated from the Finnish by Leonard Bucknall Eyre, (New York: Tudor Publishing Co., 1928), p. 246.

4 Osborn, op. cit., p. 96.

5 "Organic Evolution", Encyclopedia Britannica, (1951 edition; Chicago, London, Toronto: Encyclopedia Britannica Inc., 1951), VIII, 916.

Ray's view was held and taught by such men as Linnaeus (1707-1778) and Georges Cuvier (1769-1832) who defended it from the attacks of the opposing school.

It is interesting to note that representatives of this view were generally men who also held most closely to the Mosaic account of creation in opposition to existing theories of evolution.[6] For, actually, the lines set up by non-fertility between species is a potent argument against evolution. It is impossible to cross these lines today, and it is difficult to think of these lines as having come into existence by the mere accumulation of variation. For, as Graebner says, the requirements for a new species would be the following: 1. they must show a character no ancestor possessed, 2. they must show that the "new character will breed true in all circumstances and persist through continuous transmission," 3. there must be a difference of form, habit, and structure, 4. they must not be fertile with any other variety or species.[7]

Such men as Buffon and Lamarck disagreed violently with Ray, Linnaeus, and Cuvier. They and many others preferred to emphasize the similarities between the various forms rather than the differences. Perhaps they preferred

---

[6] Ibid., passim.

[7] Theodore Graebner, God and the Cosmos, (Grand Rapids: William B. Eerdmans Publishing Company, 1932), pp. 202-204.

this view because it was more in conformity with their philosophies of nature and the theories they were trying to set forth. Lamarck's own definition of species, which H. F. Osborn quotes, reads as follows:

> ....A species is a collection of similar individuals which are perpetuated by generation in the same condition, as long as their environment has not changed sufficiently to bring about variation in their habits, their character, and their form.[8]

One notes, however, that Lamarck omits the controversial point whether the ability to reproduce fertile offspring is one of the criteria for determining the various species.

The results of this controversy are still evident today. There still is much confusion as to the classification of plant and animal life. For example, some say that there are sixty-two species of British brambles and roses, while others say that there are only two.

Concept of Variations by the Special Creationist

Despite their strong belief in the concept of species and in the Mosaic account, the special creationists still had a number of difficult problems to face. Some of these men found it hard to conceive of God creating all of the species and variants that have ever existed. As early as

---

[8] Osborn, op. cit., p. 172.

the sixteenth century Suarez Francisco (1548-1617) taught that new species and variants had been derived since creation through the combination of old species.[9]

Linnaeus (1707-1778) taught that all species were created immutable by God, and that, therefore, they could not develop into new species. He also taught that the variations within the species were merely degenerations from the original species that God created.[10]

Georges Cuvier (1769-1832) suggested that a series of special creations may have followed the original creations. He, too, was trying to account for the large number of variants and species. He later retracted this view.[11]

Isadore St. Hillaire (1805-1861) advanced a theory of 'limited variations of species'. He taught that variations occurred as a result of the influence of environment, but that these variations occurred only within the species and did not result in the forming of new species.[12]

Variations in the Light of the Aristotelian View

We have seen that Aristotle's concept of the internal perfecting principle accounts for the existence of

---

[9] Ibid., p. 84.

[10] Ibid., p. 128.

[11] Ibid., p. 196.

[12] Ibid., pp. 206, 207.

variations. Robert Chambers (1802-1877) was a staunch supporter of Aristotle, and he was a good example of how Aristotle's views were applied in the nineteenth century. He pictured the varieties of animals as being due to the internal perfecting principle operating within the organism. This principle is the moving force which is causing the organism to attain a higher form in future generations. These higher forms do not appear suddenly but gradually evolve. This gradual evolvement produces all of the possible variants that could appear between the lower and higher forms.[13]

Chambers also took into account the influence that environment might have in producing variations.[14] He felt that the internal perfecting principle would produce forms of life that would not be fitted to their environment. So he added a second impulse which would modify their form in accordance with their environment.

Influence of Environment on Variations

George Buffon (1707-1788) deserves special mention because it was he who first pointed out on a grand scale the possibility of environment playing a large part in the

---

[13] Ibid., p. 207.

[14] Ibid., pp. 217-218.

origin of variations.[15] Mention has already been made of scientists who followed Buffon in saying the same thing, but it must be remembered that it was Buffon who first set forth clearly the environmental factor in variation. Up to the time of Buffon, naturalists generally regarded heredity to be the only factor in the origin of variations.

Buffon also believed that heredity played a large part in variants and said that at times the effect of environment is small.[16] But, on the whole, he claimed that temperature, climate, food, and capillarity had a far reaching influence on the form of organisms.

Buffon's views largely influenced the work of Erasmus Darwin, Lamarck, and, in turn, Charles Darwin.

Erasmus Darwin (1731-1802), the grandfather of Charles Darwin, did much to further Buffon's ideas. He did not believe, however, that variations were caused directly by environment, but he believed that they were caused by the inner response of the organism to the environment.[17] In other words, the plant or animal cooperated with the environment in the production of modifications. The environment stimulates the organism into producing the change.

---

[15] Ibid., p. 180.

[16] William Cecil Dampier, A History of Science and its Relations with Philosophy and Religion, (New York: MacMillan Company, 1946), p. 94.

[17] Nordenskiold, op. cit., p. 28.

For example, stags developed horns, and cocks developed spurs because they constantly had to fight for their mates. This constant fighting caused within the stags and cocks a necessity for weapons. Consequently, through later generations the horns and spurs developed. Osborn quotes Erasmus Darwin as summing up his views in this way:

> ....all animals undergo transformations which are, in part, produced by their own exertions, in response to pleasures and pains, and many of these acquired forms or propensities are transmitted to their prosterity.[18]

Actually, Lamarck (1744-1829) is generally given credit for the views Erasmus Darwin set forth. This is due perhaps, to the fact that he presented them in a much more integrated form than did his contemporary.[19] Furthermore, he emphasized the idea of use and disuse.[20] Organs persist as long as they are used. On the other hand, when an organ is no longer needed and hence no longer used, it degenerates or is completely lost.

Osborn cites the four laws of Lamarck's theory. These are:

> ....1. Life by its internal forces tends continually to increase the volume of every body that possesses it, as well as to increase the size of all the parts of the body up to a limit which it brings about. 2. The production of a new organ or part results from a

---

[18] Osborn, op. cit., p. 145.

[19] Dampier, op. cit., p. 294.

[20] Charles Darwin, Origin of Species, (New York: J. A. Hill and Company, 1904), p. IV.

> new need or want, which continues to be felt, and from the new movement which this need initiates and causes to continue. 3. The development of organs and their force or power of action are always in direct relation to the employment of these organs. 4. All that has been acquired or altered in the organization of individuals during their life is preserved by generation and transmitted to new individuals which proceed from those which have undergone these changes.[21]

All three of the above men pictured these variations as occurring in the adult organism and then being passed on to the young. Geoffrey St. Hillaire (1772-1844) believed that the variations occurred in the embryo and not in the adult. He felt that the environment acted directly on the embryo to produce changes that would later be apparent when the embryo reached maturity. He developed this theory because he was troubled by the fact that there were too few intermediate forms between species. It must be remembered that all four of these men were attempting to prove a theory of the evolution of species. Lamarck and Erasmus Darwin felt that new species arose as a result of accumulation of many variations. Because of the evidence, St. Hillaire felt that this was impossible. Hence he developed a theory whereby a bird could be hatched directly from a reptiles egg, whereas his predecessors would have said that there were many intermediate forms between the reptile and the bird.

Whatever may have been said against the influence that

---

[21] Osborn, op. cit., p. 166.

environment has over the form of plants and animals, it must be said that the idea has become entrenched in the minds of many scientists and thinkers. As has been seen, even such men as the special creationist Isadore St. Hillaire, the son of Geoffrey St. Hillaire; and Robert Chambers of the Aristotelian school of thought, felt that environment could not be ignored. Moreover, there is today an astounding amount of honest evidence that shows the influence that environment can and does have on organisms. Dandelions grown on the side of a mountain are much smaller and stunted than those grown on a plain. Plants grown in the dark do not develop chlorophyll. These and other evidences point to the fact that the environmental factor in the origin of variations cannot be ignored.

CHAPTER IV

Concepts of the Survival of Variations

Even granting that their theories regarding the origin of variations could account in part for their origin, the naturalists still had to account for the persistence of these variations. They had to discover why some variations would last and even be improved upon in the various species, while other variations would disappear. This they tried to do by developing theories of heredity and theories of selection. As we have seen, heredity deals with "...the transmission of the physical and psychical characters of parents to their offspring," while selection deals with "...any process, natural or artificial, which tends to result in preventing certain individuals or groups of organisms from surviving and propagating, and in allowing others to do so."[1]

Concepts of Heredity and Survival of Characters

The earliest view concerning reproduction and heredity probably originated in Egypt.[2] The Egyptian view generally

---

[1] Supra, 6.

[2] William Cecil Dampier, A History of Science and its Relations with Philosophy and Religion, (New York: MacMillan Company, 1946), p. 34.

held that the father was the only real parent in that he supplied the material out of which the offspring was formed. According to this view, the mother merely provided a home and nourishment to the embryo. The offspring, according to this view, merely inherited characteristics and variations that originated in the father.

Aristotle believed that both the male and the female contributed in generation.[3] However, each contributed different characteristics. He believed that the male seed was derived from the blood, and that it supplied the form the body would take as well as motion, and the soul. The female seed, so he believed, was the menstral blood which supplied the matter out of which the body was formed. Therefore, any variations with respect to the form of the body he attributed to the father, while any variation with respect to the material out of which the body was formed was attributed to the mother.

Empedocles also felt that both the mother and father contributed to the characteristics found in the offspring.[4] But he did not specifically state which characteristics each parent contributed as did Aristotle.

The next important speculation on heredity was that of

---

[3] Eric Nordenskiold, The History of Biology, translated from the Finnish by Leonard Bucknall Eyre, (New York: Tudor Publishing Co., 1928), p. 37.

[4] Ibid., p. 17.

John Harvey who was born in 1578. He developed his concept along Aristotelian lines.[5] He felt, however, that the sperm, the male sex product, only supplied the vital force necessary to start the egg developing into the embryo and thence into the offspring. According to his theory, then, the sperm is merely the trigger that starts the mechanism in the egg to work.

Charles Bonnet (1720-1793), along with Harvey, believed that the embryo was formed solely by the mother and that the father only supplied the motivating force which set the growth of the embryo into motion. But he also believed in a theory known as the preformation theory.[6] According to his theory, the female contained, fully formed, within her all of the offspring that would be derived from her. He taught that each generation was incapsulated within the preceding generation. In other words, the female egg contained a minute but fully formed offspring that would begin to grow to normal size when it was vitalized by a male sperm. And within this offspring, even before the advent of the sperm, was another egg which contained the fully formed offspring of the next generation.

De Maupertius (1698-1759) had much to say concerning

---

[5] Ibid., pp. 117, 118.

[6] Ibid., p. 245.

generation.[7] He taught that the 'elementary particles' which formed the embryo are derived from the various structures of the bodies of both parents. For example, that part of the embryo which would later develop into the arm was derived from the arm of the parent. Therefore, the offspring would always be a sort of recollection of the parent in all of its parts. Here we have a theory which is easily adaptable to Lamarck's theory of the origin of variation. It would account for the method of transference of acquired characters from the adult to its offspring.

Despite the work of De Maupertius, whose theory preceded Bonnet's, most of Buffon's contemporaries believed in the preformation theory as it had existed prior to Bonnet's modifications. In Buffon's age the theory had merely stated that the female egg contained the fully developed offspring within it.[8] Buffon (1707-1778) objected to this theory and attempted to eliminate it by substituting another for it.[9] According to his theory all organic matter is made up of minute organic particles. When an organism eats it is actually ingesting these particles. The various organs of the body assimilate these particles which provide

---

[7] H. F. Osborn, From the Greeks to Darwin, (New York: The MacMillan Company, 1913), p. 229.

[8] Nordenskiold, op. cit., passim.

[9] Ibid., p. 225.

them with the energy that is necessary for them to carry on their work. Those particles that remain after the assimilation are then collected in the genital organs where they give rise to individuals similar to the parents.

Erasmus Darwin (1731-1802) reverted to the early Egyptian concept of generation.[10] He taught that the male parent supplies a 'filament' out of which the child develops. The mother merely nourishes the child. This meant that the child merely inherited characters from the father. Darwin recognized this weakness in his theory and said that resemblances to the mother were somehow achieved during the period of incubation.

Thus we see that prior to the middle of the nineteenth century there were many theories regarding the mechanisms behind heredity and reproduction. This uncertainty was due in part to the lack of microscopes of sufficient power to enable the men adequately to study the reproductive organs and cells. The men, therefore, had to base their theories on speculation. This resulted in the formulation of general theories which were easily adaptable to their notions of the origin of variations. It can be seen that in nearly every theory of heredity there was room for variations acquired in adulthood which are transmitted to the young. This was the explanation given for the survival of

---

[10] Ibid., p. 296.

variations. According to this the embryo in the egg was an exact duplicate of the mother. It was, therefore, easy to conceive that any changes occurring in the mother were transmitted to the offspring.

Concepts of Environment and Survival of Characters

Because it was easier to observe the influence of environment on the survival of variations, speculation in this field was of far greater consequence.

Empedocles (495-435 B.C.) was probably the first to note the influence environment might have over the survival of forms of life. As we have seen, Empedocles attributed the origin of species to the haphazard uniting of body parts. He recognized, of course, that some of these unions resulted in monstrosities which died out simply because they could not carry on the functions which life demanded of them. A human head connected to a horse's torso would not be able to eat the food the torso would require, hence, it would die. He taught, however, that some unions resulted in forms which could cope with their environment, hence, they survived. A modern version of his theory would be that the latter adapted themselves to their environment, while the former did not.

Aristotle (384-322 B.C.) recognized this phenomenon of adaptation to environment and went one step farther by saying that certain organs of the body were adapted to carry

out certain functions. Charles Darwin quotes him as saying:

> ....So what hinders the different parts (of the body) from having this merely accidental relation in nature? as the teeth, for example, grow by necessity, the front ones sharp, adapted for dividing, and the grinders flat, and serviceable for masticating the food; since they were not made for the sake of this, but were the result of accident. And in like manner as to the other parts in which there appears to exist an adaptation to an end. Wheresoever, therefore, all things together (that is, all parts of one whole) happened like as if they were made for the sake of something, these were preserved, having been appropriately constituted by an internal spontaneity; and whatsoever things were not thus constituted perished, and still perish.[11]

It must be remembered, however, that Aristotle did not believe that these adaptations came about accidentally as did Empedocles. He saw in these adaptations evidence that a superior being had been their author.

In the eighteenth and nineteenth centuries men like Buffon, Erasmus Darwin, and Lamarck applied this principle of adaptation to their theories of the origin of variations. They did not, however, state the application of their theories as completely and intelligibly as did Charles Darwin. They pictured all living things as struggling in order to live. There was, in their eyes, much competition. Among plants the competition was for soil, moisture, air, and light. The plant that was the most adapted for obtaining

---

[11] Charles Darwin, Origin of Species, (New York: J. A. Hill and Company, 1904), p. V.

these essentials prevailed over the less adapted plants. The less adapted plants were then either crowded out entirely, or, in any case, their numbers were held at a minimum. The same principle held true for animal life. Those best adapted for obtaining the essentials of life survived.

But how did these men apply this principle to the survival of variations? They taught that any variation that would better adapt the organism to its environment would persist.[12] Being better adapted to its environment it would have a better chance for reproducing than would its fellows. For example, the stag which had horns would invariably win the mate when contending for her with a stag without horns. If, then, the offspring of the individual inherited the fortunate variation, it, too, would have a better chance for survival and reproduction.

On the other hand, if a variation tended to decrease the organism's ability to cope with its environment, chances were that the individual would perish before it had an opportunity to reproduce and pass its variation on to its posterity.

Thus we see the importance that these men placed on environment. In the third chapter we noted that they believed environment to be an important factor in the origin of variations. Now we see that they also thought

---

[12] Osborn, op. cit., passim.

environment to be an important factor in sustaining these same variations.

CHAPTER V

Evaluation of the Concepts

We have seen in the foregoing chapters that many ideas have sprung up concerning the origin of life, variations, and survival of characters. We have also noted that the form that these ideas took generally conformed to the philosophies of nature which the authors of these ideas represented. Generally speaking, these philosophies of nature can be divided into two types: 1. those which recognized God as operating in nature and which attempted to determine how He operates; 2. and those which disregarded or denied God's operation in nature.

Representatives of the first type suggested that God instituted the laws of nature, and that these laws were subject to His Will. They believed that God could and did alter these laws. The most potent criticism launched against them was that their view limited their scientific research.[1] Because of their view that all of nature is subject to God's will, they frequently neglected to investigate phenomena that called for investigation. Instead of carefully investigating a problem which they faced, they often excused themselves from such investigation by

---

[1] H. F. Osborn, From the Greeks to Darwin, (New York: The MacMillan Company, 1913), passim.

saying that the answer to the problem was contained in the unfathomable will of God. Their antagonists charged, and often with some justification, that this attitude could not result in scientific advancement.

The group which represents the second type sought to find and interpret the natural laws that control nature. Their philosophy was that there are immutable laws that control nature and its development. These laws, so they maintained, were not necessarily instituted by God. Even if they were they had to be instituted in the form in which they exist. For these laws are necessary and were necessary, so they contended, even before they were established. These philosophers thus limited the concept of the sovereignty of God even though they did not entirely dispose of it.

One of the most important laws of nature which this group believes to be in force is that nature is in a constant flux.[2] It is constantly changing. With this law in mind, the representatives of the second type developed their theories of evolution. By these theories they attempted to determine the path that nature has taken in the past as a result of the operation of the law of change.

This law of flux caused much consternation among the group that held to the sovereignty of God. Many of them

---

[2] Ibid.

believed that nature is static. Once creation had been finished, there could be no room for change. They believed that God, being perfect, created perfect beings that could not be improved in any way. But yet, there seemed to be ample evidence that there are changes going on in nature. One merely had to look at the variations that existed in nature to become aware of these changes. Awareness of the evidence of variations resulted in such views as Linneaus's, who said that variations are simply degenerate forms of the original species that God had created; and Isadore St. Hillaire's theory of limited variability which proposed that variations could occur only within species.

The naturalists can be criticized because they did not take God into account in nature. In his summary of Kant's Critique of Pure Reason Alfred Weber writes:

> ....The Critique of Pure Reason regards every phenomenon as a necessary effect, and therefore excludes purposiveness from the phenomenal world. Physics merely enumerates an infinite series of causes and effects. Teleology introduces between the cause and the effect, considered as the end or goal, the means, the instrumental cause. Theoretically, teleology is valueless. However, we cannot avoid it so long as we apply our teleological sense to the study of nature. Unless we abandon one of our faculties, which is real and inevitable as reason and will, we cannot help recognizing purposiveness in the structure of the eye, the ear, and the organism in general. Though mechanism fully explains the inorganic world, the teleological view forces itself upon us when we come to consider anatomy, physiology, and biology.

---

3 Alfred Weber, History of Philosophy, translated by Frank Tilly, (New York: Charles Scribner's Sons, 1925), p. 382.

Here, then, we see a problem which faced the naturalists. For if they had viewed nature honestly they would have been compelled to admit that there is a purposeful Design in nature, that there is a God operating in it. Yet they became guilty of ruling out the investigation of the presence of God in nature. They preferred to pay attention only to 'earthly things' and simply to investigate natural laws.

Perhaps, the second mistake of these naturalists lies in their over emphasis on change in nature. We admit there are changes taking place in nature. But they failed to investigate whether there is a limit to such changes. They merely assumed that the law of change is absolute, and this gave rise to theories of evolution like Lamarck's which said that the accumulation of variations would ultimately result in a new species.

After viewing the difficulties opposing either of the above views, the thought arises whether the difficulties might be resolved by means of a compromise. Many have sought such a compromise by adhering to a view that is commonly called theistic evolution. J. T. Mueller defines theistic evolution in the following manner:

> ....Theistic evolution holds that God created the primordial material and that evolution has since been His modus operandi in developing it to its present state.[4]

---

[4] John Theodore Mueller, Christian Dogmatics, (St. Louis: Concordia Publishing House, 1934), p. 144.

This view, however, is not a worthwhile compromise. Instead of resolving the difficulties inherent in both views it simply combines the problems of both. The theistic evolutionist finds himself, in my opinion, face to face with more problems than he would have had if he had simply adhered to either the Biblical or the evolutionistic view.

Furthermore, Theodore Graebner held that the theistic evolutionist faces problems that are of a doctrinal nature. He writes:

> ....Whatever scientists do with theistic evolution, the evangelical Christian cannot accept it as a compromise between agnosticism and faith. Even theistic evolution leaves no room for the Scriptural doctrine of the Fall of Man, natural corruption, the reality of sin, and the need for a Redeemer.[5]

Dr. Graebner is correct in pointing out the theological difficulties in the evolutionary theory. For if man is descended from the brute, sin may be regarded as a deficiency inherited from the brute, which will ultimately disappear when man reaches a point higher on the evolutionary scale. With this view of sin, man cannot be held responsible for his sin. Consequently, the need for Christ's redemptive work disappears.

At this point the Christian must be careful. For if

---

[5] Theodore Graebner, God and the Cosmos, (Grand Rapids: William B. Eerdmans Publishing Company, 1932), p. 227.

his views on evolution jeopardize the doctrines of sin and Christ's redemptive work, his faith and salvation are in danger.

Nevertheless, evolution cannot be ignored. It has too firm a foothold in the universities of the world. Many young people come under the influence of its teachings, and the faith they had in their childhood is endangered. Evolution must be met. And it must be met in the laboratories by Christian scientists of the caliber of Isadore St. Hillaire and Linnaeus, who were capable of and frequently succeeded in giving an intelligent and respected Christian view of nature.

BIBLIOGRAPHY

Bible, Holy. Authorized Version.

Dampier, William Cecil. A History of Science and its Relations with Philosophy and Religion. New York: MacMillan Company, 1946.

Darwin, Charles. Origin of Species. New York: J. A. Hill and Company, 1904.

Durant, Will. The Story of Philosophy. New York: Garden City Publishing Company, Inc., 1943.

Graebner, Theodore. God and the Cosmos. Grand Rapids: Eerdmans Publishing Company, 1932.

Lillie, Ralph Steynor. General Biology and Philosophy of Organism. Chicago: University of Chicago Press, 1945.

Martin, Theodore A. "Bearing of the Theory of Evolution on the Doctrine of Man." Unpublished Bachelor's Thesis, Concordia Seminary, St. Louis, 1939.

Mueller, John Theodore. Christian Dogmatics. St. Louis: Concordia Publishing House, 1934.

Nordenskiold, Erik. The History of Biology: translated from the Finnish by Leonard Bucknall Eyre. New York: Tudor Publishing Company, 1928.

"Organic Evolution," Encyclopedia Britannica. VIII. 1951 edition. Chicago, London, Toronto: Encyclopedia Britannica Inc., 1951. pp. 915-929.

Osborn, Henry Fairfield. From the Greeks to Darwin. New York: MacMillan Company, 1913.

Weber, Alfred. History of Philosophy: translated from the German by Frank Thilly. New York: Charles Scribner's Sons, 1925.

Webster's Collegiate Dictionary. Fifth edition. Springfield: G. and C. Merriam Company, 1947. pp. 346, 466, 902.