MONOGRAPH TWO

Creation and Evolution

Second Edition

by

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Published by The American Scientific Affiliation, a group of Christian scientific men devoting themselves to the task of reviewing, preparing, and distributing information on the authenticity, historicity, and scientific aspects of the Holy Scriptures in order that the faith of many in Jesus Christ may be firmly established.

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Additional copies may be obtained from:

The American Scientific Affiliation
324 ½ S. Second Street
Mankato, Minnesota 56001

1st edition 1950

Reprinted 1951, 1966

2nd edition 1967

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INTRODUCTION

Current books on evolution are taking for granted that animals and plants are derived from other kinds of animals and plants. Abundant factual material is presented which is interpreted to mean that from one or a few simple forms have descended all the types now existing or that have lived in the past. No one denies facts, every intelligent man should try to see what is the meaning of the facts, but facts may fit different viewpoints than those which are held by the majority of writers. The facts and interpretations of biologists and geologists are to be examined in this monograph for the conclusions that may be drawn from observations and experiments regarding the origin of kinds of organisms. The evolutionary hypothesis and the creation doctrine will be compared in their use of scientific data.

Creationists have various ideas concerning how many species were created according to Genesis and how many may be descendents of the originals. Some hold that God made the first forms of every species, if by species is meant those forms which produce offspring among themselves but will not have living fertile offspring with other forms.[1] Others believe that the Creator endowed animals and plants with the ability to produce descendants as different from each other as are the members within a major group of animals.[2] To some, the house fly, the fruit fly and the horse fly were separate in their origin. Others may even believe that two species of fruit flies which will not produce fertile offsprings with each other (**Drosophila melanogaster** and **Drosophila simulans**) had separate origins at the time of creation. Or they think the two species were incorrectly classified in the first place. But there are non-evolutionists who think the evidence favors the probability that all the species of flies may have had the same ancestors. This does not mean that flies and bees, which belong to different major groups of insects, had the same ancestry. Reasons why special creations are believed necessary to originate the basic forms of each major group will be presented in this monograph.

Brewster describes the varied uses of the word "create" and the ideas that have been held by creationists. He holds that "create" and "make" are interchangable and synonymous with the Biblical phrase "Let . . . bring forth." "But make means almost anything. We elders 'make' beds and the morning train. . . So 'make' means anything from 'shape' to 'do' and 'create' is only a narrowed and strengthened 'make'."[3] He proposes that if anything living comes directly from inorganic matter or dead flesh the occurrence be called spontaneous generation; if one type arises from another living type it be called evolution. If neither occurs but life arises, "we may call it Special Creation." Accepting this definition, let creation be implied whenever any group of plants or animals is not derived from any other group by a series of transitions. For example, evolutionists do not know the origin of verte-

brates. "The oldest ancestors of the vertebrates are unknown, and may always remain unknown."[4] So I shall hold that they were created. Although as Brewster remarks, " . . . God 'created' has always meant 'I don't know',"[5] nevertheless because of his belief in revelation, a creationist can say, I don't know how it was done, but I know Who did it." Reliance is placed on a Person to whom much power is attributed in the Scriptures.

The "I don't know" of the creationist is likely to soothe him into a complacency so that he does not search the natural sciences for explanations of natural phenomena. Perhaps the phrase "God made it that way" is an excuse for lack of research. Adam, before the fall, was commanded to "replenish the earth, and subdue it." One of his first tasks was naming the animals and birds. His task is continuing today. During an eight year period, "Dr. Gertsch, of the American Museum, has described some 500 new species of North American spiders."[6] "A million and a half species of animals combined is a conservative estimate"[7] of the total number to be expected. Adam had to learn in order to "subdue the earth," especially after his fall. Likewise, today's generation must learn from the past and add to its knowledge to fulfill its task assigned to it through its earliest parent.

Evolution as a term applies to as limited a change as the splitting of a species into its varieties or such large changes as the derivation of all living things from a few simple beginnings. For example, if the Savannah Sparrow of the mainland gives rise to the Ipswich Sparrow, living on Sable Island 100 miles off the coast of North America, evolution has occurred. But this is a very restricted use of the term. In this sense, creationists are evolutionists. Any change at all of any amount, no matter how small, may be called evolution. So believing that the descendants of Adam and Eve are now members of different races is believing in evolution in this restricted sense.

In addition to its use as the "origin of species," the term evolution implies "from the beginning or organic life on the habitable planet, a gradual unfolding and branching out into all the varied forms of beings which constitute the animal and plant kingdoms."[8] From one sparrow to another and from protozoa to men are comprehended in the term "evolution." It is the intent of this discussion to determine how far this process has proceeded. It should not be concluded that because one accepts transistions of some kinds into others that he necessarily accepts all the evolutionary changes that have been postuiated.

In order to understand the problems of origins, the student needs a course in biology and one in geology. An actual acquaintance with the species in some group of animals, e.g. birds, cr a comparable group of plants such as evergreens, enables a thinker to appreciate the intricacy of the arguments in favor of and against evolution.

THE ORIGIN OF VARIETY IN NATURE

There are about 800,000 kinds of animals and 250,000 kinds of plants "Kinds" means "species" as used here. Our problem is to decide whether each of these kinds was specially created or whether a number of basic types which were created have had descendants differing enough to account for the large number of species. One apparent difficulty in answering is that those who classify living things disagree regarding what forms are to be included in genera, species, and sub-species. This lack of unanimity results from the great variation between and within types that can be set apart from other types by any structural or physiological difference. Mayr states that "at least 94 of the listed 755 full species of North American birds will be considered by some authors to be merely sub-species of other species." However, "there is extremely little disagreement in well-worked taxonomic groups as to the limit of the species. Nearly all authors will agree as to what is a species and what is not, except for the border-line cases . . ." We shall not be hindered to any great extent, then, by lack of agreement among biologists as to whether different animals are to be classified as different species or merely varieties within the same species. We shall be more concerned with deciding whether different animals, no matter what they are called, could have arisen from common ancestry or whether they could have arisen only by a direct creative act.

One should not insist that "kind" means species. After an intensive study of each verse in which the phrase "after its kind" is used, J. Barton Payne concluded that it subdivides whatever it is applied to.[9] Thus "grass after its kind" means "kinds of grass." So not just one species of grass was created, but several species. However this does not rule out the possibility of some of these originally created species developing into additional species. Whatever were first created were species, but Scripture does not teach fixity of species.

Three other suggestions have been made regarding the use of the word "kind" in Genesis. (1) a breeding type, so that the descendants are o fthe same "kind" as the parents, no matter in how many respects the offspring may differ from their parents; (2) the idea in God's mind of what each type of animal should be;[10] (3) the phrase, "after its kind," may mean "all kinds of in the same sense that it appears to be used in the account of the flood (Gen. 6:20).[11]

The species concept was originated by Linnaeus in 1758. He assumed that the species he could identify were each one created. Later in life, Linnaeus presumed the "genus" to be the "kind" of Genesis. Today "Linnaean species are sometimes nearer our genera, and Linnaean genera are almost like our families;[12] yet, "a majority of the Linnaean species are still treated as species."[13] Instead of equating "kind" with any category of classification, it is wise to study living and fossil plants and animals to discover what variety is possible by descent from an original type (e.g. the races of mankind from

the first pair) and what types are not related by descent but are distinct creations.

One reason for holding the idea that all species are not separately created is that several species have similarities of appearance to one another so they are placed in the same genus. These are readily distinguished from another collection of species which ar classified together in a second genus. The obvious reason why the members of a genus are similar is that they descended from a common ancestor. Notice an illustration from the sparrows. In the genus **Zonotrichia** are three species possessing white wing bars. The White-crowned Sparrow has a gray throat and a black and white-striped head; the White-throated Sparrow has a white throat and a black and white head; and the Harris's Sparrow has a black crown and black throat. This genus is easily distinguished from the genus **Melospiza**, which includes the Lincoln's, Swamp, and Song Sparrows, and readily told from the genus **Spizella** composed of the Tree, Chipping, Clay-colored, and Field Sparrows. The similar members within these genera are assumed to have a common origin. One population of White-throated Sparrows may have lost white throats and increased the white in the crowns to become White-crowned Sparrows. A change from White-throated to White-crowned Sparrows could have arisen by mutation.

Not all genera can be as easily distinguished as the ones used for illustration. A study of Mayr's chapter on "The Higher Categories" reveals that the limits of the genus are subjectively determined. Some genera could be lumped together with others and a genus with many species could be split into several genera. No one doubts the similarity between species, but the specialists may differ on just which ones to put in one genus and which into another. The same confusion exists regarding some members of larger categories. This lack of sharp discrimination is a further suggestion that some species have a common ancestry. The fact that some animals cannot be easily assigned to a group is taken by evolutionists to mean that all groups have descended from a few forms of life or from one.

Species are gathered into genera, genera into families, families into orders, orders into classes and classes into phyla. Shull maintains that "this grouping within groups would not be expected if each group had arisen independently of other groups of the same rank . . . The very obvious order which exists amid all the diversity of living things can scarcely be reconciled with a totally independent origin of each of the groups."[14] This argues against fixity of species on naturalistic grounds. Hamilton sees no problem in this similarity: he writes ". . . would not a world order in which every species was different from every other species be far harder to attribute to one God than the world order with its similarities such as we see around us?"[15]

Similarities between the species of a genus have at least two explanations: The species have remote ancestors in common or they have been made by the same Designer. Note some details which reflect on the explanations. The male and female Red-wing Blackbirds are quite unlike in color markings, yet they may have had the same parents. In shape and size and in structure of all parts except the reproductive organs however they are nearly identical. Common heredity accounts for the similarities and permits the differences. Also, in many structures the Red-wing and the Baltimore Oriole are similar. Knowledge of their history does not go back far enough to tell if they are related. One may infer relationship because of the many items of likeness. But the Red-wing and the Oriole belong to the same order of birds, and because of the same order may have descended from the same remote ancestor, as the paleontological record indicates, it may be concluded that birds no more widely separated structurally than are Orioles and Redwings have arisen from one stock living in the past.

Some orthodox theologians have seen that the facts of natural variability suggest the derivation of some species from others. F. E. Hamilton writes, "The theory of a common mind back of the similarities of the organic world seems far more logical than the theory of descent, especially if we hold, as the present writer does, that in many cases the species or even genera are descended from common original types created by God."[16] He has also stated, "All the common similarities between species can be accounted for on the theory that God created certain 'kinds,' and that these kinds broke up into the various species as we have them in the world today . . ."[17]

Douglas Dewar, author of a series of articles in the Sunday School Times[18] does "not assert that every species, or every genus, or even, every family has been especially created. I do not know what the units of creation are; it may be that they do not exactly coincide with any of the present systematic categories."[19] The intent of A. Rendle Short's passage on the "Creation-Narrative in Genesis," written for the Inter-Varsity Fellowship of Evangelical Unions, London, is that there is plenty of room for differences of opinion on what are the kinds of Genesis, how many there were, and how much their descendants have changed since creation. He concludes, "That which must be firmly held by Christians who honour the Bible as the Word of God is the fact that God is the Creator of the heaven, the Earth, and all living things, whatever methods He may have used; that the creation-narrative of Genesis is a true account; and that man is a special creation of God, though this does not necessarily mean that God created him out of nothing at all."[20]

Sometimes it is thought that if anyone ever produced life in a laboratory, he would have done away with the idea of God as Creator. Not so. If one finds how a plant makes starch, he has not done away with the plant. If one makes life, he has not done away with God, who made it originally. The more mechanistic a thing is shown to be, the more need there is to presume that intelligence is responsible for its production. The more we understand life and its activities the more need there is to recognize a Divine Machinist.

ADAPTATION

To believers in both evolution and creation ". . . the nice adjustment of the structural and physiological properties of organisms to the environment is truly remarkable."[21] Adaptations to living in water or in the air, to four-footed or upright posture, to herbivorous or carnivorous diets speak of forces that have clearly channeled animals into their behavior or suggest a Creator, who has given animals their peculiar structures which enable them to live where they now live. Even if it is thoroughly understood how an adaption is brought about, one needs also the explanation that a Person initiated the structures and functions and the environment that work so harmoniously together.

Note that "the characters of the higher ranks (classes, orders, families) are often, perhaps usually, adaptive, those of genera less often or less certainly so, while known specific distinctions are usually not adaptive."[22] This suggests that the distinctive adaptive nature of the higher ranks are the result of planning by a Creator. The species have few distinctions which are adaptive and so have resulted from non-adaptive mutations.

SUMMARY

Because the difference between the species within a genus or the genera within a family are comparable to the distinctions between races, we are justified in believing that all members of a genus or family have been descended from the same ancestors. This does not mean, however, that all animals and plants have arisen from one or a few original types of life. A study of fossils and of heredity will indicate to what extent animals may be derived from others and what groups had their origin from direct creative activity.

THE MEANING OF SIMILARITIES BETWEEN SPECIES

Within one family can be found children closely resembling their parents, and those which are less like their parents and more like their grand parents. These likenesses to parents and differences from parents occur in persons known to have common inheritance. Likewise we concede common ancestry to Negroes and whites if both are traced back to pre-historic times. Creationists find the source of all races in Adam. All races have fundamental similarities such as muscular and nervous structure, and minor differences such as skin color, hair texture, and distribution of hair. Both the similarities and differences result from the inter-action of genes and their environment.

Any human race has many genes that are identical with those of other races. A Negro may have genes for dark skin and yet possess the same genes for a blood group as a white person. Within a race occur a large number of combinations of genes so that one member may be tall and blond, another short and dark. In fact, there is no "pure race." Essentially then, any human being is related to any other because he has a stock of genes common to every other member of the race. All men belong to one species, for any race can combine its genes with those of any other race and can have living, reproducing offspring.

The similarities between different species are sometimes the result of the same kind of genes. Two species of fruit flies, **Drosophila melanogaster** and **Drosophila simulans**, are very much alike in appearance. There is also a close resemblance between the germ cells of the two species. Hybrids reveal that many genes are the same in both kinds of flies. These genes have the same locations on the chromosomes; the characters resulting from them are homologous, and they look alike. Therefore the species are considered to be related.

"Where hybrids cannot be obtained (as in the case of the majority of comparison of Drosophila species) the judgment regarding gene homology is of necessity based on the similarity of the phenotypic effects of the genes. Admittedly, this is a serious flaw in the method, which must, consequently, be applied with greatest caution. "Mimic mutants" produced by nonallelic genes in the same species are not a rare occurrence."[1] An illustration is found in eye colors. Two red-eyed flies of one species look alike. But one is the wild type red and the other is scarlet. The scarlet mimics the red and is caused by a pair of genes different from wild type genes. Here, then, are similarities which do not result from similar genes.

Another type of similarity is caused by parallel mutations.[2] Two species of **Drosophila** have white-eyed forms but both were observed to arise independently from the wild flies which were red-eyed in each species. **Drosophila melanogaster** had been red-eyed for many generations and then a white-eyed variety appeared; a corresponding event happened in **Droso-**

phila simulans. Identical appearances are not from common parentage but by mutations which occurred in each of two distinct species. The white eyes of **Drosophila simulans** did not descend from the white eyes of **Drosophila melanogaster**. The white eyes are homologous. ". . . They are due to corresponding parts of the hereditary constitution."[3] 'When these occur and are preserved in stocks which are already specifically distinct, the Darwinian concept of homology breaks down. For the homology, though perfectly real no longer implies descent from a common ancestor showing the common feature."[4] It merely implies they both have an ability to change in the same direction.

The meaning of similarities usually held by biologists is as follows. **Drosophila** species resemble one another in external appearance and in chromosome pattern more than they r e s e m b l e house flies. In the majority of features, species of **Drosophila** are similar; therefore they are related. The respects in which they resemble house flies are evidences of relationship to them, although the kinship is not as recent as among the **Drosophila** themselves. Although in particular features, as the mutual possessions of white eyes, similarities may not indicate common ancestry, the sum total of all similarities is taken to indicate relationship. Huxley emphasizes that the arm of man, the wing of a bird and the flipper of the whale have a common structural plan and it cannot be conceived that they arose independently for there are so many steps necessary if arm, wing and flipper evolved from some previous structure not like themselves that "no biologist would venture to suggest" that they "could have been separately evolved in more than one stock."[5] That is, the difficulties in getting wings or arms by accumulating many changes suggest that wings were evolved from arms; they could not have come from several independent sources, so they must have descended from one ancestral structure.

As previously indicated it is usually held that such homologous organs result from similar genes. Harland, on the contrary, considers that "organs such as the eye which are common to all vertebrate animals, preserve their **essential similarity** in structure or function, though the genes responsible for this organ must have become wholly altered during the evolutionary process, since there is no reason now to suppose that homologous organs have anything genetically in common."[6] To see the meaning of this quotation think back to the time when there were neither birds nor mammals. A quadruped had arms, forearms and hands determined by a group of cooperating genes. In later generations, it is presumed, the arm and hands were modified in the direction of a wing by mutations in some descendants and towards the mammalian arm in others. Perhaps after several mutations, the genes formerly concerned with the arm could cooperate with other genes which could not previously act on the arm. Eventually when wings were complete, genes were acting which had had no effect in the original quadruped and some genes helping to make the arm of the first quadruped were no longer affecting the development of the arm at all. We are now supposing "that homologous organs" do not "have anything genetically in common" and

yet supposing at the same time that homologous organs are indicating genetic kinship. If a man's arm and a whale's flipper do not have the same gene, one cannot prove that they had the same ancestry. If similar characters, involving only the quality of eye color as in the example from **Drosophila**, do not necessarily mean descent from a common ancestor surely a complex organ in one class, such as birds, so similar to the corresponding organ in another class such as mammals, need not mean a common ancestry for both. It is not certain that 'similarity can be reasonably attributed to only one cause, namely, heredity from a common ancestor'."[7]

One further consideration weakens the idea that similarity necessarily implies kinship. It is the "widespread occurrence of convergence."[8] That is, changes in unrelated groups tending to make them similar. An example is taken from birds. A tern has a bill shaped like a dagger; so do herons and kingfishers. All have bills which are obviously adapted to catching fish. Here are quite similar structures in different orders of birds. The similarity is explained as a result of independent acquisitions (convergences) and not because kingfishers and terns descended from herons.

An additional consideration is that similarity results from the design of creation. Students who were " . . . theoretically inclined, such as Goethe and Oken, regarded the existence of structural plans common to a large number of animals as evidence of some form of planning in the act of creation. In extreme form, this theoretical view found the basis of homology in the existence of a limited number of archetypal ideas in the mind of the creator."[9]

A well known university professor said in one of his courses, "Design of creation is a psychological explanation which can not be definitely disproved." But can the evolutionary assumption be proved? Do the fossil lineages show that the resemblances in arm and wing can be traced back to the same source? Dobzhansky holds that the paleontological series do show this[10] because classifications based on comparative anatomy correspond in general to those based on fossil pedigrees. Huxley says that "save for a few fossil lineages, we do not and cannot know the actual course of events in the evolution of a group."[11] So we have relatively little confirmation of common ancestry for different groups supposed to be related. They may be undergoing parallel changes or have reached their present degree of likeness by convergence. Of course, when an evolutionist says a group is unrelated to another it is a relative matter, for all animals and plants are considered to be related if traced back far enough. In the discussion on paleontology, it will be indicated that some genera evidently have changed into other genera, but that orders can not be traced back to parental stocks belonging to other orders. In concluding that one order arose from another, evolutionists place their reliance on the principle we are examining which is that similarity of one group to another group suggests their kinship.

To what extent has experimental genetics indicated that similarity is the result of kinship? Genes common to two species can be revealed when-

ever hybrids can be produced; it is unnecessary that the hybrids be fertile. Hybrids are known between forms considered different species (**Drosophila melanogaster** and **Drosophila simulans**); between different genera (cabbage by radish); between different sub-families (ferret by skunk), and between different orders (**Fundulus** by mackerel). In the latter case, the embryos were abnormal but did show maternal and paternal characteristics. Such results indicate that certain species have hereditary units compatible with those of other species. The body of a skunk is produced by the genes he received from his two parents: the body of the hybrid between the ferret and the skunk came from a combination of ferret and skunk genes. Because ferret and skunk can be hybridized both of them could have arisen from one species. They are similar because of their kinship. But animals which cannot be crossed can give no evidence of relationship; it must be inferred from the resemblances. If cats and beavers will not cross, we have no way of knowing how much genic material they have alike, if any. To decide whether they have ancestors in common we must consult paleontological evidence to see if they can be traced back to common ancestors.

RESEMBLANCES BETWEEN EMBRYOS

In view of the resemblances between adult animals, one would expect their embryos to be similar also. For development to occur at all, it must begin with a single cell fertilized by a sperm. The processes leading to the differentiation of the germ layers are fundamentally the same in all animals as also are processes which produce the organs.

All vertebrates are characterized by a dorsal nerve cord, an internal skeleton and "gill slits opening from the throat to the outside or touching the outside wall in at least the developmental stages."[12] But in the human embryo, ". . . the branchial arches . . do not acquire gills, only occasionally are the arches fully separated by transitory clefts."[13] Associated with these arches are blood vessels, muscles, and grooves entering between the arches from the outside. A study of the derivatives of the gill arches[14] will convince one that practically all of the material which becomes gills in a fish is used for the construction of certain of the structures of the throat region in man. A common plan is followed in all vertebrates and modified for the needs of the developing individual and the fully formed organism. This common plan may be attributed to descent from an ancient vertebrate or to a Creator who uses the same fundamental process for all vertebrates but varies it at will for specifice purposes.

A debate on the significance of the gill arches is carried on between Dewar's books [15] and the volumes by Davies.[16] Dewar insists that the "fish plan" of arteries in the head region is necessary even for mammals to have an adequate early circulation. Davies replies that the modification of the "fish plan" suggests that air breathers are "an after thought." Such modification of a common plan to the needs of the organism surely could be the result of thought. Each class of vertebrate, whether fish, amphibian, reptile, bird or mammal, has an efficient circulation. Creative activity is not bound to make an entirely different arrangement of blood vessels for each class.

It has done well if it makes an efficient arrangement. If certain of the blood vessels are found only for a short time in the embryo and then degenerate, one need not say this is to a Creator's discredit. Rather let him notice the Creator is more sparing of His plans than of material.

Aortic arches are transient structures that do not resemble the schematic diagrams commonly found in textbooks of comparative anatomy, as Streeter made plain in his presidential address to the American Association of Anatomists as published in Science, April 29, 1927.[17]

VESTIGIAL ORGANS

An organ which remains undeveloped in the adult is called vestigial. Creationists have felt that vestigial organs are evidence of degeneration in animals whose former condition was nearer perfection. " . . . Genesis iii.14 may be interpreted as perhaps implying that there was a time when the snake did crawl in the dust but walked."[18] "The existence of true vestiges . . . is not inconsistent with the theory that every main organic type has been specially created and that some types have degenerated."[19] On the other hand vestigial structures are held by evolutionists to indicate relationship.

Actually not all organs claimed to be vestigial are useless ". . . It is not well to call an organ functionless prematurely and it has ever been the history of anatomy to discover new functions for so-called vestigial structures —witness the present interest in the endocrine glands."[20] "So many of the so-called vestiges of embryology may prove to play leading roles in the development of the individual."[21]

The appendix, generally regarded as vestigial, is a pouch ending blindly at the beginning of the large intestines. In the same position, an adult rabbit has a caecum nearly a foot long in which vegetable material ferments in order to be more completely digested. But the human appendix averages 3½ inches, although it may be absent or as long as 9 inches. Its cavity is too small to permit digestive activity within it. It produces a slight amount of mucus. There are many lymphocytes in its connective tissue. Lymphocytes are considered the stem cells from which arise all other types of blood cells, both red and white.[22] It may be that a convenient supply of these cells at the beginning of the large intestines is helpful in combating the action of the numerous bacteria found there. To be sure, the appendix becomes inflamed, necessitating removal. In this, it shares the lot of nearly all parts of the body, for scarcely any organ is free from the possibility of infection. The appendix may not even be a vestigial structure. William L. Strauss, Jr., of John Hopkins has commented that. "There is no longer any justification for regarding the vermifor appendix as a vestigial structure."[23]

The coccyx ". . . corresponds to the tail vertebrae of other animals. It is much reduced in size."[24] To it are attached two muscles (levator ani and sphincter ani) which act as a cradle for the pelvic contents, constrict the anal opening and assist in the expulsion of the fecal mass. A portion of the heaviest muscle of the thigh is attached to the coccyx, as well as a rudimentary muscle (coccygeus) which assists one of the cradle muscles in upholding

the pelvic floor. "In rare instances the coccyx is over-developed and produces a tail-like projection."[25] Specimens as long as 3 inches have been recorded in the newborn; most of these are soft and fleshy, but a few have contained skeletal elements."[26] In a motion picture made by Dr. P. Kenneth Gieser, a physician in Wheaton, Illinois, there was a Chinese baby with a very evident tail. But should it be presumed that because a part of the body has developed in a manner resembling some animal, that the body is therefore derived from that animal? There are abnormalities of the bodily development that cannot be taken to refer to any ancestral condition, but are merely disarrangements of the embryological process. To what ancestor does hair-lip point? Are we descended from an animal with an open-roofed skull and virtual absence of brain because the human newborn occasionally has the anomaly called cranioschisis? Because the limbs may fail to develop, were our ancestors limbless? It is as logical to attribute anomalies to deranged development as to inheritance from a remote ancestor.

The muscles of the external ear are considered vestigial. One extends from the skull to the ear and covers the posterior auricular vessels and nerve. the other two go from the ear to the tough connective tissue of the scalp. These muscles and the epicranius muscle aid in keeping the scalp tense which is necessary where the scalp is not attached to the skull directly by connective tissue. The ear also has an increased blood supply by way of the muscles.[27]

The slender red crescent at the inner corner of the human eye called the semilunar fold resembles the third eyelid found in both birds and some modern reptiles. Birds are not in our ancestry and "we do not really know whether the palcozoic reptiles possessed this particular feature or not. At any rate, the fold serves to regulate the flow of tears."[28]

The hind legs of whales are so reduced that in some species they do not appear on the surface. Regarding them Hamilton asks, "Suppose a whale originally had hind legs. Does that mean that it is a descendant of reptiles who walked on land? Perhaps, but is it not more reasonable to suppose that such rudimentary bones were used in a fin as a means of swimming and that such a fin was later on lost through a mutation? There is no reason for thinking that because the animal possessed such organs it was ever anything but a whale. As for the snake the same thing can be said."[29] Limbs can be lost by mutations. Snyder pictures a family in which the father and children have neither hands nor feet as a result of genes."[30] Vestigial wings in fruit flies occur by a germinal change that caused reduction of wings in one generation.

"The splint bones at the sides of the feet of horses recall the ancestral condition in which there were at least four toes."[31] The splints are vestiges, but also structures serving useful purposes. "These, as Hayes points out, (1) strengthen the leg, (2) serve as an attachment for certain muscles, (3) in conjunction with the cannon bone form a groove in which lies the upper part of the suspensory ligament, — an elastic brace supporting the fetlock and counteracting the effects of weight."[32]

THE DISTRIBUTION OF ANIMALS

Genesis states that God created plants, animals and man. This man gave names to "all cattle, and to birds of the heavens and to every beast of the field." Animals undoubtedly spread from the place or places of their origin and also from Eden, located somewhere in the region of the Tigris and Euphrates rivers. Later in the flood "all that was on the dry land died" from the waters which covered the mountains. The portion of the earth covered by the flood was repopulated by the survivors from the ark as they spread from the mountains of Ararat where the ark rested.

The flood occurred after men appeared for its purpose was to destroy wicked men. No evidence of fossilized men has been found before the Pleistocene, the most recent of the geological strata, so the flood may be considered a late Pleistocene event. The Pleistocene epoch witnessed relatively little change in the structure of animals. "In any region where the fauna is adequately known, we find close relatives of mammals now living there, although the Pleistocene forms are often larger than their modern descendants. But, in addition, there are invariably numerous animals now extinct; and most of these are of large size."[1] Therefore we cannot assume that very much change has occurred in animals after the Pleistocene and after the flood.

Let us presume for a moment that the flood was world wide and it caused a destruction of the types of animals found in the Pleistocene. The ark preserved pairs of these also but because there are now no living representatives of such forms as giant kangaroos and mastodons, these perished after the flood. There are, however, smaller kangaroos now living. If kangaroos were in the ark and first touched land in Asia, one could expect fossils of them in Asia. According to Romer,[2] the only place there are either fossil or living kangaroos is in Australia. What shall we conclude? If the fossil evidence means that there never have been kangaroos in Asia, then kangaroos were not in the ark, or if they were, they migrated from Australia to meet Noah, and after the flood returned to their native land. Is it not easier to believe that they never were in the ark, and hence were in an area untouched by the flood, and that the flood occurred only in the area inhabited by man?

There are other well known examples of animals which have never lived in Asia. The endentates (sloths, armadillos, anteaters) are confined to tropical America or Texas although in the past ground sloths were found in Pennsylvania.[3] Many animals have had a more extensive distribution than at present but a large number of these have not been traced back to the place of the landing of the ark. This indicates that they were not in the ark. Two alternatives remain; either these animals developed after the flood or they were living in countries not affected by the flood. Because the endentates were in existence long before the Pleistocene they did not originate after the flood. Therefore they were not in the region covered by the waters The conclusion is that the flood was not world wide and had only a temporary effect on animal distribution. The animals in the ark repopulated

the devastated regions; other areas already had their own fauna which may have helped in the repopulation of the flooded regions.

A comprehensive criticism of this view is found in **The Genesis Flood** by Whitcomb and Morris.[4] They maintain that the kangaroos in the ark and their descendants could have migrated to Australia in a relatively short time. Obviously we cannot determine from an incomplete fossil record whether the flood was universal or local.

Let us turn to the ideas regarding the origin of species that are presented by students of geographic distribution. "Species are limited to certain definite regions."[5] An illustration is found in the honeysucker (**Drepanididae**), a family of birds found only in the Hawaiian Islands. Some of them have bills for eating seeds, others for hard nuts, and one genus can loosen bark to get insects. They had long bills for obtaining nectar from tubular flowers as well as insect-eating bills. All these birds belong to one family of eighteen genera are descendants from some migrant to these Islands. The probable source of the Hawaiian Islands is from volcanic or coral action in a not-too-distant geological past. Furthermore only four other families of the order to which the honeysucker are assigned can be found on the Islands. The scarcity of Hawaiian families indicates that the Hawaiian birds are migrants. One sees therefore, in the **Drepanididae** how varied the descendants of a single kind of bird may be. All of us believe that the domestic varieties of poultry, dogs, and cattle have rescended from single ancestral stocks; we can admit that even more variations from a common ancestor may have occurred.

Ty noting the range of a species in relation to the range of a similar one, we are led to the idea that one s p e c i e s gave rise to the other. The ranges of the Flicker and the Red-shafted Flicker overlap in the great plains, where hybrids occur, but in th western United States the Red-shafted is common and in the Eastern part of the country the Flicker, easily distinguished from the other by yellow instead of salmon color under the wings and tail. Since they differ in colors probably determined by mutations, one is probably ancestral to the other. It is easier to assume that one species was derived from the other than to believe that both are special creations. By similar reasoning we may conclude that all woodpeckers may have been derived from one type of woodpecker. Caution should be used, however, for only as similar types are found to replace each other in adjacent areas can the conclusion be safely reached.

Although the distribution of animals indicates that some species have been derived from others, is there any limit to this derivation of types from other types? Recall that in the Cambrian period, where first appear fossils in any number, "as if suddenly, all the principal phyla of animals are represented."[6] These Cambrian forms are about as complex as present forms. Because two-thirds of geological time was passed before the first extensive series of fossils was preserved, we know practically nothing about the origin of phyla. Simpson reminds us that there is almost a universal absence of connecting links between the higher categories of vertebrates.[7] Because

the missing links are inferred to be soft-bodied creatures lacking parts capable of being fossilized there is no fossil evidence to tell us from what group the vertebrates came. We are at a loss to know the origin of the phyla, classes and orders of animals. It is reasonable to believe the earliest members were created.

The ancestors of Edentates apparently first lived in South America, spreading northward. The kangaroos and some other types of marsupials have given no evidence of residence elsewhere than Australia. Such facts indicate that there have been appearances of distinct groups of animals on the continental nuclei,[8] those bodies of land which have never been under the ocean, e.g. Australia. Where did the kangaroos come from? Either from creative activity on Australia or by modification of some other marsupial. Cretaceous marsupials have been found in North and South America, and they are present in Eocene beds in Europe and South America. They probably reached Europe from North America, but whether they originated in the Northern or the Southern Hemisphere, either in Australia or South America is a matter of guesswork in view of the small amount of evidence.[9] A land connection is supposed to have existed between South America and Australia hence it is believed that the ancestors of marsupials migrated from one continent to the other before the land masses became disconnected. The first stratum in Australia bearing fossil marsupials is the Miocene, two epochs later than the Cretaceous. In the Miocene only one genus is found **Wynyardia**).[10] Is **Wynyardia** ancestral to the kangaroo? If we are correct in assuming that the members of an order may have a common ancestor, then we may conclude that **Wynyardia is ancestral to the kangaroo.**

Where shall we draw the boundaries of the groups descending from created animals? Draw it where paleontologists indicate there are gaps — between orders in practically all cases, also between man and the apes. A ten million year gap in the Pliocene separates four footed apes from bipedal men. We may need to revise our conceptions as new fossil finds come to light but the boundaries of most orders are fairly well known. "During the present century a very great amount of paleontological work has been done, and many strange forms have been brought to light. These, however, have been almost always members of groups already known or forms tending to connect such groups."[11] Because marsupials are separated by structural gaps unbridged by intermediate forms from other orders of mammals, a creationist may conclude that the first marsupials were created. Whenever a gap is filled then a revision of the idea of what are the special creations should be made,

Orthodox Christians have assented to this position. Hamilton remarks. "Ordinary variation and mutation within the genus, or perhaps in some case within the family, starting from a fixed point as a center and spreading in all directions, varying as it goes, would account for all these intergradients as well as the theory of evolution."[12] My suggestion is to carry the logic one step further and say "within the order." Dewar says "the flora and fauna of oceanic islands, therefore, seem to indicate that the new species and genera and possibly two sub-families, have arisen by evolution."[13]

FOSSILS SUGGEST CREATION

The opinion of the majority of biologists is that "fossils constitute one of the most convincing indications of the origin of species at different periods, and of the general course which evolution has taken if the assumption be made that all forms, or at least large groups of them, are genetically connected with one another."[1] The previous sections of this work have indicated that animals in the minor systematic groups have common ancestry. It is probable that all the species within a genus and the genera within a family, and even all the families of an order have arisen by division of an original ancestral species.

Creationists have varied interpretations of paleontological findings. In my opinion, the best position is that of Dewar, who writes, "Let me here clearly state my views regarding the units of creation. I do not assert that every species, or every genus, or even, every family has been specially created."[2] Hamilton agrees with Dewar. He believes " . . . even most conservative Christians could find the view of a progressive creation of various forms of life over successive geological ages, in harmony with the Bible."[3]

The fossils are remains of animals and plants found in nearly all strata except the earliest, and even in them there are materials suggestive of fossils."[4] This study accepts the conclusions of geologists regarding the arrangement of the strata and the estimated age of them. Several have questioned the geologist's ability to date the strata, however, and believe that they resulted from the flood.[5] At any rate, a belief in the findings of geologists regarding the strata does not automatically make a person an evolutionist. There are creationists who believe the days mentioned in the first chapter of Genesis are long periods of time and others that long periods occurred between the days. Some hold that the strata were laid between Genesis 1:1 and Genesis 1:2. Wiseman thinks the days were days in which the story of creation was related.[6]

Evidence of life is found in very ancient strata. The Archaeozoic strata contain graphite, which may be the result of the carbon cycle carried on by simple plants. "Enormous masses of limestone . . . also probably owe their origin to secretion by plants.'[7] In the Grand Canyon there are sponges composed of silica. Even worms and protozoa of the order of Radiolaria also may have existed in the Proterozoic.

The major groups of animals appeared suddenly in the Cambrian. "All the principal phyla of animals are represented."[8] There is no definite evidence of vertebrate animals but "even the vertebrates may not have been absent since fishes appear in the very next period . . ."[9] and ". . . only a small portion of existent types were fossilized."[10] Romer states that " . . . it is possible that highly developed vertebrate types may have been in existence in the Cambrian . . ."[11]

The evolutionary view is that this cannot be the sudden eruption or creation that it appears to be but the outburst was preceded by a " . . . long period of unrecorded evolution."[12] Just because a stratum has the earliest fossil of an organism does not mean that the organism first existed during the deposition of that stratum. For example, " . . . the true flowering plants appear suddenly in such abundance and variety in late Cretaceous that it is generally assumed they originated much earlier, though little fossil evidence of them in earlier periods has been obtained."[13] If all the major groups of animals are found in the Cambrian stratum, one can believe either that they originated at the time the stratum was deposited or that they originated in some previous age. If they arose before a stratum was laid down it appears that their time of origin and their method of origin cannot be determined except by inferences from structural similarities. If we may consider the first recorded fossils to be in the layers made at the time the organisms first appeared, then it is possible to believe in a direct creation of animals, for the major groups appeared with the major structural characteristics of their groups in complete form.

Furthermore, there is a considerable variety of forms at the time of their first appearance. Shull states that there were a thousand species of trilobites in the Cambrian. There are hundreds of species of brachipods. Even vertebrates my not have been absent. There must have been abundant plant life to furnish food for the animals, none of which can make their own food but must depend upon plants, directly or indirectly. If all species of trilobites developed from one species, there must have been a time of development unrecorded in the Cambrian during which the thousand species were being formed.

Some animals flourished and became extinct. The thousand species of trilobites in the Cambrian became over twelve hundred species grouped into one hundred twenty five genera in the next stratum. Only a few of these genera are the same as those of the Cambrian and there are ten new families. These descendents of the Cambrian trilobites have undergone considerable transmutation. The more recent forms do not possess strikingly different structures, but have modifications of organs already present in the earliest types. Because these modifications are comparable to the changes produced in a species by mutations, one may believe that the later trilobites descended from the earliest trilobites.

Were the trilobites changed so much in successive ages that they became something other than trilobites? The descendants of the early species became so much altered that they were grouped into 13 families in the Ardovican, only three of which existed in the Cambrian.[14] "No new family arose after the Ordovician period. . ."[15] No fossils which link the trilobites to animals belonging to other orders or classes of animals have been unearthed.

As a rule the ancient types of animals are already divided into their classes and orders. Molluscs as different as bivalves, snails, pteropods, and cephalopods occur in the Cambrian. Straight cepalopods of earlier ages turn

into coiled cephalopods, one of which became the Chambered Nautilus. Each order of the molluscs is distinguishable from other orders.

Some animals have survived from their origin to the present with very little change. The horseshoe crabs occur first in the Silurian ". . . but by Jurassic time only the genus Limulus existed, and this same genus survives today."[16] Lingula a brachipod, has not changed since the Ordovician. Many of the vertebrates have changed very little. The lungfish, for example, has remained much the same from the Dovonian. Some groups appear, vary in later ages, and either become extinct of more varied. Still others persist from their origin to the present with little change.

Bone, a complex tissue, is the earliest kind of skeletal material found in the strata. Cartilage occurs later. Two subclasses of bony fishes were "already quite distinct at their first appearance in the fossil record."[17] An ancient order of fishes, the ostracoderms, is represented by several distinct groups."[18] Amphibia are supposed to have come from the crossopterygian fishes, but ". . . the better known genera are probably too specialized or too late in time to have been the actual ancestors. . . ."[19]

The earliest reptiles are in the Pennsylvanian. But our knowledge of them is gained from the coal swamps " . . . we know nothing of the life of higher and dryer regions where reptiles might well have already been numerous."[20] The increase in the number of orders and families may represent merely the finding in later strata of animals which existed earlier in dryer areas but were not preserved. The dinosaurs " . . . were already divided at their first appearance into two distinct stocks . . . ."[21]

Birds began as birds. A genus, Archaeopteryx, left its dead body in the Jurassic. "Archaeopteryx was already definitely a bird. . ."[22] Mayr comments that if birds became extinct at the Archaeopteryx stage, ". . . Archaeopteryx would be listed merely as an aberrant order of feathered reptiles."[23] He believes this genus is ". . . as perfect a missing link between reptiles and birds as one could possibly hope for."[24] Simpson writes that these earliest birds subdivide but do not fill the gap between birds and reptiles.[25]

Mammalian fossils are recognizable from their teeth. Early records consist mostly of jaws. The mammals of Triassic times probably disappeared; " . . . we know extremely little about their history during almost the entire span of the Mesozoic."[26] Also "we know little except the dental anatomy of the forms which have been found, and the sparseness of the record suggests that many groups which have escaped discovery may well have existed."[27] The two major groups of mammals, the marsupials and the placentals, occur together in the late Cretaceous beds,[28] in the time preceding the Eocene with its rapid rise of mammals.[29] It is possible that some of the mammals supposed to have arisen in the Eocene were living in the age before it, because even in the third age before the Eocene, "the oldest known mammals appear in 'Rhaetic' beds at about the Triassic-Jurassic boundary."[30] Note that birds arose in the Jurassic and by "Eocene time most of the birds were of modern type."[31]

The history of the horse is one of the best recorded of all the animals beginning with an animal of the Eocene called Eohippus in America and Hyracotherium in Europe. There were four toes on its front feet and three on its hind feet. "In the front foot all traces of the thumb had disappeared; but the other four toes were all functional although the outer one was comparatively small."[32] The molar teeth had a simple crown pattern. Between Hyracotherium and the modern horse is a series which shows gradual changes to single toes on each each foot and a complicated molar tooth pattern. Simpson says. "if the change in any one character from Hyracotherium to Equus is divided into 300 steps, these steps are imperceptibly small and are incomparably less than the amount of intragroup variation at any one time."[33]

Bear in mind that Hyracotherium is a genuine member of the horse family, Equidae. "Despite the great difference between Hyracotherium and Equus, most of the characters of the Equidae did not change appreciably throughout thir history."[34] Simpson states that Hyrocotherium was a backboned animal, nourished its newborn young by milk and its unborn young by a placenta, had hoofs in uneven number, had the shape of a horse and was a horse. This is ". . . a classificatory way of saying that the vast majority of its multitude of morphological characters were already the same as those preserved in Equus and in all equids as well as in many other more or less related animals."[35]

Note that there is a gap between Hyracotherium and its supposed ancestor, a condylarth, a member of a different order. "But nowhere in the world has any recognizable trace been found of an animal that would close the considerable structural gap between Hyracotherium and the most likely ancestral order, the Condylarthra."[36] The difference between a condylarth and Hyracetherium are less than between Hyracetherium and Equus. To an evolutionist, this means that a condylarth evolved very rapidly into Hyracotherium,[37] to a creationist the absence of bridging fossils suggest the need for a creative act to produce Hyracotherium.

It is reasonable to believe in the creation of " . . . cattle and creeping things, and beast of the earth after his kind . . ."[38] occurring in some of the fairly recent geological periods. Evolutionists account for appearance of many kinds of mammals in the Eocene by assuming that they were being evolved from reptiles in regions where no strata were being formed in previous periods. From an evolutionary point of view there could not be a sudden appearance of clearly recognized horses, cameis, pigs, rodents, carnivores and monkeys. To be sure, these may not be identical with the species of today but they do belong to the same order as our recent species. Although there were reptiles that are called "mammal-like" which lived in the ages preceding the rise of mammals they were similar to mammals but not ancestral to them. There are many kinds of reptiles and many kinds of mammals, therefore it is to be expected that some reptiles and some mammals would be similar to one another.

An inspection of a chart which pictures the relationships of mammalian groups arranged by similarities of structure reveals the gaps between the orders of mammals.[39] Simpson writes, " . . . it is a fact that discontinuities are almost always and systematically present at the origin of really higher categories . . ."[40] When animals are traceable to other animals by a closely graded series of transitional forms, then one should believe the early forms are ancestral to the later ones. But when a group of animals is separated from another group by an unbridged gap, creationists hold that the groups so separated have arisen from independently created kinds.

Mayr has given the following explanations of the absence of missing links. Sometimes new fossil finds indicate that there were animals and plants structurally intermediate between types formerly separated by gaps. Because so few fossils have been found, there is an inadequate picture of all kinds of organisms that have lived. Furthermore, many animals leave no fossils because they have no hard parts or their habits or habitats prevent them from leaving remains. If animals lived in areas of erosion, or in a deep sea whose sediments have never been exposed, or left their bodies in strata subsequently metamorphosed by heat or pressure, it is unlikely that there would be any trace of them. Probably the major reason why transitional animals are not found is that during the periods of change of organisms from one kind to another, there was rapid evolution in only a few individuals. If only a small number of animals were evolving during the time when conditions which prevent fossil formation were at work, there is additional probability that the missing links will remain missing.[41] Some of these reasons listed were also used by Darwin to account for the imperfection of the geological record.

Genesis implies that a number of kinds of creatures had separate beginnings and the fossil record has many orders with unbridged gaps.

The earliest representatives of the major groups (orders, classes, phyla) of animals and plants are complex organisms. They are separated by structural gaps from the members of other groups. The gaps remain unbridged by a series of fossils grading between one group and another, so one may conclude that the ancestors of the groups are created and not descended from other orders. Within the orders and families there is evidence of descent with modification.

THE ORIGIN OF MAN

To study the origin of man the Christian should first know what the Bible says. In Genesis 1 God said, "Let us make man in our own image, after our likeness." The likeness is of the spirit. God is a spirit so the image is the image of His spirit, of His moral nature, His mental nature, endowing man with His knowledge and His purposes. God also said, "Let them have dominion" over living creatures and over all the earth. God's image in man functions as man talks to God and as he controls the natural world.

In Genesis 2 a little more detail is added. Man was formed of the dust of the ground. His body is of earthy substances. The animals, too, came from similar material for God said, "Let the earth bring forth living creatures." But in addition God breathed into man's nostrils the breath of life and man became a living being. The "living being" and the "living creature" are translations of the same Hebrew word. Hence we learn that a divine act occurred when God made man alive. He assembled the physical substance and then He made it alive. His breathing should not be taken as a technical description for God does not have lungs, but His breathing suggests a direct contact of Divine ability upon human flesh to make it alive.

The Roman Catholics "accept the possibility that man could have risen from a non-human creature, and that God merely endowed him with a soul which act constituted the 'creation of man' culturally, mentally and spiritually."[1]

This same theistic evolutionary view was espoused by the Baptist theologian, A. H. Strong, who wrote, "while we grant, then, that man is the last stage in the development of life and that he has a brute ancestry, we regard him also as the offspring of God. The same God who was the author of the brute became in due time the creator of man. Though man came through the brute, he did not come from the brute, but from God, the father of spirits and the author of life."[2] There are evangelical as well as liberal churchmen who find this statement acceptable.

It seems to me the order in Genesis does not suggest that God took living flesh of animals and added to it a spirit to form man. God first formed the flesh, then He made it alive. This interpretation of Scripture rules out for me the theistic evolution of man which derives him from a common ancestor with other creatures.

What do the fossils tell us about the origin of man? To answer this we must first identify the fossil as human. How is this done? There are two ways. First, by anatomical means. Upright posture is a definite structural feature of man. He has pelvic bones that permit him to be bipedal; he does not go on all fours. Of course, many fossils of creatures who show similarities in their anatomical structure are represented only by skulls, or parts of skulls. But if the skull is similar to the skulls of other creatures known to have bipedal anatomy, then it is logical to attribute upright posture to the creature of which we have only a skull.

A second way of identifying man is by his cultural objects. Are stone tools, or clear evidence of fire, found with bones? Some skeletons are associated with implements but numbers of them are not. Fire made by man may not be inferred safely from charcoal alone, since brush fires could well be the source of it, but charred bones are a much more definite indication.

To define man as the Scriptures do, it is necessary to know if he could talk and if he had a knowledge of God. The first activity of man in Genesis was the naming of the animals. Could the men represented by the fossils talk? Probably if they could produce objects of art, they could also speak. Hence it is likely that the Aurignacian who made small statues could also communicate. And later cave painters surely had words as well as drawings. Ability to speak may also be inferred from the structure of the lower jaw. If it has a projection backwards from the meeting of the two halves, it is possible that the muscles attached to this genial tubercle were sufficiently well developed to enable their possessors to speak. Some fossil jaws have definite tubercles.

Religion may be inferred if an ancient man buried his dead because this implies he had a belief in life after death. Also altars may stand for worship of the supernatural. However, they may have been a means of incinerating unwanted flesh.

Enough has been written to make one hesitate to be dogmatic on just which of the ancient creatures with anatomy similar to man had the God given capacities that Adam received by creation. But our curiosity leads us to make the attempt at a tentative identification. As long as we do justice to Scripture we may be permitted our interpretation until someone makes better ones.

Students of fossils assumed that man evolved from the ancestors of the apes because man shares so many anatomical features in common with the apes. Keith lists 369 which man shares with the chimpanzee, 385 with the gorilla, 354 with the orangutan and 117 with the gibbon and only 112 with common monkeys. But there are 312 structural characteristics that are found in man alone.[3] However, similarity does not prove common ancestry. It just as logically points to a common Creator. For similarity to reveal ancestry, there must also be a series of fossils changing gradually from the supposed ancestor to the descendant. To show that man came from ape-like ancestors one should have a series of fossils from a four-footed beast to a bipedal creature, and from him up to tool making manlike creatures and from them to speaking and worshipping man.

Such a series has not been unearthed. But such a series would reveal little of the origin of culture that must have occurred in the evolutionary view of the origin of man. Buswell has stressed the cultural gap between man and pre-human ancestors. He states, "One of the most remarkable things that consistently occurs, however, is that every attempt to get at cultural human origins, no matter whether it uncovers new information about pri-

mate behavior and social structure or not, always serves to sharpen and reinforce the gap between them more explicitly.[4] He believes that man's culture is not a result of heredity but is learned after birth while non-human behavior is born in an animal. Buswell concludes "Creationists have too long entered into heated controversy among themselves as well as with evolutionists over various aspects of the fossil record, to the exclusion of the consideration of the very area where the modern evolutionary explanation is at a total loss."

Let us examine the fossile record. A readily available source of this is von Koenigwald's book on **The Evolution of Man.**

Recall the geological formations beginning with the most recent and going backward in time.

Present time

Pleistocene

Pliocene

Miocene

Oligocene,

etc. going backward into ancient time.

In the Miocene there are fossils of anthropoid apes which are quadrupeds. In the Pleistocene appeared **Australopithecus,** the first bipedal animal. But no series has been found in the Pliocene, in which bipedalism would have been evolving, if it did evolve. Fossil finds in the Pliocene are rare. There are a few ape skeletons such as **Dryopithecus, Ramapithecus,** (the **pithecus** meaning ape) but this whole 10,000,000 year formation has provided no evidence of a series leading to **Australopithecus.**

Now the **Australopithecus** can be considered man only from judgments based on anatomy. The tools found with them were made by **Homa habilis,** a contemporary.[5] Von Koenigswald considers them "a distinct and fairly close group of hominids, which must be considered a side branch of man's family tree sharing a distant precursor with him." A recent article in the National Geographic (January 1963) describes **Kenyapithecus** which the author feels, "suggests a step in the ancestry of man." Such a statement represents opinion and not fact. Note the **Kenyapithecus** is dated way back in the beginning of the Pliocene. It is also separated from **Australopithecus** by this tremendous gap of the Pliocene. Another fossil find referred to is **Zinjanthropus,** but it resembles the Australopithecines and is on the recent side of the gap. Incidentally, **Zinjanthropus** was considered to be 1,750,000 years old. Caution is necessary in accepting such a date, which was determined by the potassium-argon method which revealed dating inconsistences as you can discover if you read the article evaluating this method which appeared in Science, April 27, 1962, written by William L. Straus, Jr. and Charles B. Hunt of the faculty of John Hopkins University.

Pithecanthropus is the so called Java ape-man consisting of skull and jaw fragments and a femur resembling present day man. **Pithecanthropus** is now called **Homo erectus.** One of these jaw fragments (**Meganthropus**) had the genial tubercle which no ape has. Perhaps attributing speech to this creature is an "overconfident assertion," wrote von Koenigswald. However, no tools are associated with these fossils, and there is no evidence of fire or altars or burial of the dead. I conclude there were pre-Adamic creatures but not man as Scripture portrays him.

The next fossils considered human by anthropologists are from China and called **Sinanthropus.** "Because of the scarcity of the material, we can only guess that Peking man's tools were probably of the fluke type," writes van Koenigswald. Living, perhaps, at this time were **Atlanthropus** and Swanscombe man. Both were hand axe users. Stone culture is not found associated with Neanderthal, Heidelberg and Steinheim finds according to von Koenigswald. but Solecki in Science, January 18, 1963, pictures stone tools of Neanderthals found in Shanidar Cave in Iraq. Neanderthal man is not considered to have a genetic connection with modern man, Homo sapiens; but Steinheim and Swanscombe are believed to be ancestral. There is good evidence for an advanced hand axe culture of Swanscombe man. No information is available about fire, burial, or altars in either Steinheim or Swanscombe. Again the circumstantial evidence of anatomy is the chief means of considering these finds to be ancestral to us.

Where then are the first humans as the Bible pictures them? Murk holds that it is only among the sculptures and cave painters that we are sure to be among our ancestors.[6] Surely if these Aurignacians could paint they could also talk. Adam and Eve, then, were ancestral to the artists of the caves who lived late in the paleolithic period.

This section is revised from the author's article in Covenant Youth Today, October 13, 1963, and reprinted by permission of the Covenant Press Chicago.

THE SCIENCE OF HEREDITY AND THE SOURCE OF SPECIES

A geneticist has stated that "No individual can claim such a mastery of all facts pertaining to evolution to enable him to present . . ."[1] a full discussion of the facts, laws and theories of evolution. This appears to me to be especially true of the bearing of the science of heredity on evolution. Therefore this discussion is limited largely to a consideration of the question, "To what extent have species changed into other species?"

Some species appear to have descended from others. If two species can be crossed and living offspring produced, there is proof of compatible germ cells from the two species. The obvious source of their hereditary material is decent from a common ancestor. An example of such crossing is found in two birds of the eastern United States, the Golden-winged Warbler and the Blue-winged Warbler. Their hybrids are called Lawrence's Warbler if they have black throats, and Brewster's Warbler if they do not. The hybrids show the characteristics of the parents variously distributed to the offspring. A typical Lawrence's Warbler has a black throat from the Golden-winged parent but has yellow underparts like the Blue-winged ancestor. Similarly, upper parts, wing bars, and ear patches are typical of one parent or the other. Because the hybrids combine traits of both parents, it is probable that the two parental types were derived from one source.

In 1941 is was thought that **Drosophila pseudoobscura** had two races. A and B which differed from each other, not in any observable external appearance but in the arrangement of genes on the chromosomes. The genes in one race are in a certain order; in the other race, some of the genes are inverted.[2] The races were told apart by breeding tests. Race A produced fertile offsprings when mated with Race 2, but when mated with Race B, sterile male offsprings are the result. Here was an indication of the subdivision of a species. Today B is considered a distinct species and is called **Drosophilla persimilis.**[3]

In **Drosophla melanogaster.** differences in character have appeared before there has been any reduction of fertility between members of the species. There are hundreds of variations affecting such characters as eye color, wing size, and body color. Yet each variety crosses with any other to produce fertile offspring. When a chromosomal change arises which will make those individuals possessing some traits sterile with those displaying other traits, then there will be two species. If this occurs, character differences will have preceded reproductive differences in species alteration.

In nature, a number of species of **Drosophila** actually differ in the ways seen in the flies already discussed. Chromosomal rearrangements have occurred within the members of one species; " . . . the chromosomal differences between species are identical in kind, if not in degree, with those found among races and individuals."[4] We readily accept the idea that the

members of one species have a common ancestry. We should believe that flies now admittedly separate species have a common ancestry if the differences between them are the kinds that occur within one species. Bear in mind that there are at least 613 species of the one genus **Drosophila.**

If we grant that a species gives rise to a new species, must the conclusion be drawn that the first living protoplasm could have been the ancestor of all kinds of living things? As a creationist, one may accept the origin of species from other species, but need not believe that a protozoan was transformed into a coelenterate, or a coelenterate into a worm and that similar major transformations have occurred leading to man. That there is a large assumption in evolutionary belief which is not forced by genetic knowledge is evident in the following quotation, "Experience shows, however, that there is no way toward understanding of the mechanisms of macroevolutionary changes, which require time on geological scales, other than through understanding of microevolutionary processes observable within the span of a human lifetime, often controlled by man's will and sometimes reproducible in laboratory experiments."[5]

Hereditary studies are incapable of establishing the assumed connection between all types of life. A university geneticist in a recent lecture remarked, "The higher categories and the problems there presented are a good ways from the field where genetics can make a direct contribution." Crosses can be made between species and between genera, and only infrequently between members of different families. Because species in different orders have not been crossed, there is no information about the similarities and differences in the genes of the members. We cannot put genes from two orders into one hybrid; birds and reptiles will not cross; we cannot therefore demonstrate by genetic means that birds and reptiles have come from one common ancestor. The creationist interprets the Scriptures to mean that the original kinds, brought forth by the command of God, such as fowls and creeping things, did not spring from one another.

Notice some of the difficulties there would be in producing the species of one phylum from another. If a jellyfish came from a protozoan, a single celled animal would have to become many celled. These cells must be arranged into layers, perhaps by the impushing of one side of a hollow ball of cells. The outer cells must acquire contractile fibers at their bases. Certain outer cells need to produce stinging capsules and the whole mass be arranged into a body and tentacles. Only in imagination can there be found heredity changes capable of producing all these advances which must have occurred if members of one phylum were to change into members of another phylum, but an evolutionist believes that in the past there were mutations which could accumulate to yield these advances. The mutations which have been noted have altered organism within a limited sphere. One of my professors said, "It would be a miracle that a mutation causing diversity would also cause convergence for an adaptive end."

GOLDSCHMIDT'S THEORY

Neo-Darwinian geneticists conceive that a species changes slowly over many generations until it forms reproductively isolated populations which can be considered two species. But Goldschmidt has questioned the ability of mutations to produce specific differences. "Microevolution by accumulation of micromutations — we may also say neo-Darwinian evolution -- is a process which leads to diversification strictly within the species, usually, if not exclusively, for the sake of adaption of the species to specific conditions within the area which it is able to occupy."[6] Consequently, he has postulated a different evolutionary mechanism, "Species and the higher categories originate in single macroevolutionary steps as completely new genetic systems. The genetical process which is involved consists of a repatterning of the chromosomes, which results in a new genetic system."[7] No mutations need to appear; all that is necessary is translocation[8] or inversion[9] of genes already present.

This process, he states, will produce new species more rapidly than by the slow accumulation of small mutations. **Drosophila miranda** and **Drosophila pseudoobscura** are only slightly different in external appearances, but hybrids between the species are sterile. Studies of chromosomes reveal that the species are distinguished by different arrangements of similar genes. But Goldschmidt believes that a relatively small repatterning of chromosomes will also produce considerable changes in appearance.[10] This would avoid the difficulties of conceiving a gradual change from one species to another.[11] Peculiar structures like the preformed exit in a plant for the insect living in it could have been formed at a single step. The imitation of a distasteful species of butterfly by an inoffensive one need not be by a gradual change over many generations but could have occurred in one generation merely by rearrangement of the positions of the parts of chromosomes.

Goldschmidt emphasizes the large amount of change which may be produced in an offspring if a rearrangement occurs in the chromosomes of germ cells. The development of the offspring is considerably altered. The wing pattern in a butterfly (**Papilio dardanus**) varies markedly depending on a few differences in genes. It is supposed that a rearrangement of these genes would produce as great or a greater difference. There would be "macroevolution by single large steps."[12] However, some of the new characters in fruit flies showing greatest change from normal characters, such as the appearance of four wings instead of two, are the result of simple mutations and not the result of pattern changes. Goldschmidt presumed that alterations occur in the germ cells and surivive or perish there. They need not wait until they have produced visible characters and these characters have been selected for survival or death. The altered chromosomal pattern finally selected affects a developing individual so strikingly that a decidedly different form is produced. "The first bird hatched from a reptilian egg."[13]

In summary, Goldschmidt's view is this: Slow accumulation of mutations over many generations will not change one species into another but the re-

arrangement of the genes will produce in the germ cells a pattern resulting in strikingly altered offspring which have become different species from the parents in a single step and are separated from them by a "bridgeless gap."

This idea has not been accepted by other geneticists. Dobzhansky notes that Goldschmidt's " . . . systemic mutations . . . have never been observed. It is possible to imagine a mutation so drastic that its product becomes a monster hurling itself beyond the confines of a species, genus, family or class . . . The assumption that such a product may, however rarely, walk the earth, overtaxes one's credulity. . . ."[14] Again, " . . . the simplicity of Goldschmidt's theory is that of a belief in miracles."[15] Goldschmidt admits "unfortunately no experimental attack upon this problem is at present apparent. . . ."[16] Goldschmidt's chromosomal mutations, which he believed would cause new species, are no different than those which occur within races of the same species. Goldschmidt is offering nothing new; he is merely claiming more for hereditary changes than other geneticists do.

Single genetic changes may produce striking effects but the result is not likely to be a structure working harmoniously with other parts of the body. Sumner holds that such "jumps" as Goldschmidt believes in are not integrated with the rest of the animal. To get a bird from a reptile by any other means than the slow accumulation of small changes, which is typical Darwinian evolution, would need "the direct intervention of the Creator Himself." "Only the wave of the magician's wand could have transformed the scales of a reptile forthright into the plumage of a bird."[17]

Another criticism of Goldschmidt's work is that he maintains species to be discrete groups, separated by the bridgeless gap from other species. Bridgeless, that is, by any other mechanism than the rapid transformations which he thinks his systemic mutations will produce. But species do not fit into rigid compartments. "The lack of universality of such rigid subdivisions is what has ever since Darwin been one of the main arguments in favor of evolution."[13] Certain species can easily be told apart. However, there are some species that blend into others; intermediates are placed arbitrarily. Among flies of the genus Drosophila, some types seem to belong to distinct species, other variants are classified according to the opinion of th investigator into different species or merely into different races of the same species.[19] Further, Dobzhansky and others point to the lack of definition of species by Goldschmidt so that a reader has difficulty in detecting where these "bridgeless gaps" betwen species exist. Consequently " . . . the main premise of this theory is wholly unacceptable."[20]

It should be mentioned to the credit of both Goldschmidt and Dobzansky, that the latter admits, "It must, nevertheless, be recognized that Goldschmidt's keenly critical knowledge has emphasized the weaknesses and deficiencies of the neo-Darwinian conception of evolution, which are numerous as even partisans ought to have the courage to admit. It would seem that this fact alone obliges anyone interested in the modern evolutionary thought to read Goldschmidt's book."[21]

COMPLEX ORGANS

The source of structures as complex as the eye has always been difficult to determine. "Here is one of the puzzles of evolution which appears to be still far from solution."[22] Goldschmidt has listed nineteen different features which he challenges Darwinian evolutionists to explain "by accumulation and selection of small mutants."[23] Mayr has admitted that "it is a considerable strain on ones credulity to assume that finely balanced systems such as the eye or a feather could be improved by random mutations."[24]

The eye appears as if at a single jump from no definite previous form, and "transitional stages are wholly conjectural."[25] There are eight or more theories of the origin of the eye in a volume by Walls. None of these is corroborated by comparative anatomy, because no animals exist possessing the stages which should have preceded the eyes of the cyclostomes, primitive vertebrates which in all essentials are like mammalian eyes. What caused the lens to be formed from the outer layer at the same time the retina was developing from the nerve is a "tantalizing mystery."[26]

The study of heredity provides practically no evidence for a type of genetic change capable of producing the transformation of any kind of simple light-sensitive structure into a complex organ of vision. A duplication of genes at one location on a chromosome of a fly will reduce the number of facets in a compound eye to a bar eye. Several eye color alterations have appeared but these are shades of red; ". . . the colors are all in the red range, none green or blue. Some other insects have green eyes, hence the absence of green in Drosophila must mean that mutations which would result in that color are impossible."[27] A certain mutation produces an eyeless condition. Another gives a structure like an antenna "instead of an eye or combined with a rudimentary eye."[28] Not only is it difficult to see how mutations could improve the eye as it now exists but also how they could begin to form an eye in the first place. Froriep compared the origin of the eye to the birth of Athena full grown from the brow of Zeus. Because creation is the making of something without the necessity of a prototype, this abrupt appearance of the eye in the vertebrates is an evidence for Creation.

DIVINE CREATION

One modern scholar has seen the reasonableness of creation. "Some people assume, entirly as a matter of faith, a Divine Creation of living substance. The only alternative seems to be the assumption that at some time in the dim past, the chance association of the requisite chemicals in the presence of favorable temperature, moisture, etc., produced living protoplasm. In other words, if one subscribes to this theory, he admits that the first protoplasm to appear on our earth was a product of spontaneous generation. Then, if he accepts the evidence of Pasteur and others against spontaneous generation,

he must reverse his explanation of the origin of the first protoplasm to explain the origin of all subsequent living protoplasm from the first protoplast. In other words, spontaneous generation, according to these opponents of the idea of Divine Creation, worked when the first living substance was formed, but probably hasn't worked since. Actually, biologists are still as far away as they ever were in their attempts to explain how the first protoplasm originated. The evidence of those who would explain life's origin on the basis of the accidental combination of suitable chemical elements is no more tangible than that of these people who place their faith in Divine Creation as the explanation of the development of life. Obviously, the latter have as much justification for their belief as do the former. It is possible that the problem of life's beginning on our planet will always remain insoluble, a philosophical question rather than a subject capable of experimental investigation and solution."[29]

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