

THE FORM AND STRUCTURE OF LIVING THINGS

FRANK L. MARSH*

Creationists and evolutionists have vastly different concepts of comparative anatomy. The evolutionist holds that the more closely basic types of living things resemble each other physically in body line or chemistry the closer is their blood relationship. In contrast, the creationist holds that because the Creator spoke all the basic types into existence from the dust of the earth on Days Three, Five, and Six of the literal Creation week, there is no genetic relationship between them. Any similarity in anatomy, for instance, is due to one Creator with a master plan.

Regarding man, the truth of the literal Genesis account of his origin is attested by the Lord Jesus Christ in Matthew 19:4-6. That the Creator ceased at the end of Creation week to form new basic types of organisms is stated in Genesis 2:2 and verified in nature. The discontinuity among both living and fossil forms constitutes real evidence of the creation of basic kinds. According to the natural record, from the day of their creation, all Genesis kinds have continued to bring forth only after their kinds. Variation has never been known to accomplish more than the production of a new variety of a basic type already in existence.

I

Introduction

The scientist who accepts the origin of plants and animals depicted in Genesis 1 and 2 has a vastly different concept of comparative anatomy than one who believes that all living things have developed from one or a few single-celled organisms. Most evolutionists hold the concept that *all* organisms are blood related, and that the more closely living things resemble each other physically in body line or chemistry the closer is their blood relationship.

Contrastingly, most creationists believe that there is no blood relationship between basic types, and that any resemblance among these created kinds was the result of a materialized plan once existent only in the mind of the omniscient, omnipotent, omnipresent, transcendent Creator. To the impartial mind, if there be such a wonder in the natural world, and if we remain purely theoretical, these doctrines are equally logical and reasonable. Albeit only one is in harmony with the assertions of the Bible.

II

Origin of Form and Structure

What was the origin of this form and structure with which comparative anatomy is concerned? According to the Hebrew Scriptures all kinds of plants and then animals appeared instantaneously in all their various and intriguing forms as the result of the Creator's fiat to the earth to produce them.

In Genesis 1:11, 12 the created forms of plants are designated as grass (*deshe*, whose root signifies "to be damp"), herbs (*esebh*, herbage), and trees (*ets peri*, trees of fruit). These three broad groups evidently are intended to cover all vegetation. The first group very possibly does not include grass as we know it, but may refer to such forms as mosses, liverworts, lichens, and other carpeting kinds of the earth than grass.

The translation of the Greek Septuagint notwithstanding, members of the second group are obviously distinct from those of the first as borne out by 2 Kings 19:26 and Isaiah 37:27, where they are again mentioned separately in an enumeration. Also members of the second group are described as *mazria zera*, or "seeding seed." It would thus appear that members of this group are prominent as seed bearers,

It is this group, *esebh*, which is stated in Genesis 1:29 to have been given to man along with fleshy fruits and nuts as his food. The King-James - Version - (KJV) - of - the - Bible translation "herb of the field (Revised Standard Version-RSV-"plant of the field"), which is used in Genesis 3:18 to describe a part of the food given to man after his sin, is from this same *esebh*. *Esebh* is also used in Deuteronomy 11:15 to describe the food of cattle. Thus this second group appears to include all plants between mosses, liverworts, lichens, ferns, and other non-seed-bearing plants, and the woody shrubs and trees.

Ets peri, trees of fruit, the term covering the third group, is a singular collective that stands for woody plants bearing dry nuts and cones, and fleshy fruits such as berries, drupes, pomes, et cetera.

These three broad groups do not coincide with modern classifications of plants, nevertheless they are apt because without getting technical, for the man on the street they paint the picture of the origin of *all* vegetation,—the lowly forms, the taller herbaceous forms, and the woody shrubs and trees.

All Basic Plant Kinds Created

Genesis 1:11, 12 states very clearly that in the span of a single day consisting of a period of darkness and a period of light, i.e., a solar, 24-hour day, the Creator brought all the basic kinds of plants into existence. It is important to notice that this vegetation included seed-bearing plants which evolutionists affirm to be the most highly

*Frank L. Marsh, Ph.D., is Professor of Biology, Andrews University, Berrien Springs, Michigan 49104.

and recently evolved forms. This special revelation of natural truth was given to man so that he may *know* that every distinct kind of plant that ever lived on the earth was formed on Day Three of Creation week.

It is profitable right here to point out that, with regard to the plants, not only does Genesis describe the origin of basic types or kinds, but it also makes clear what would be the appearance of the succeeding generations of each kind. Occasionally it is argued that Genesis 1:11, 12 merely states that the Creator formed the plants in their various basic types but says nothing about their reproductive behavior. This interpretation seems to infer that in future generations at least some of the basic kinds could have eventually produced other basic kinds which would be so different from the original created forms as to become new basic types.

However, in consulting Bible commentators it will be found that the large majority state that these verses describe not only the origin but also the reproductive behavior of the created types of plants. That this is the correct interpretation of the Hebrew is made clear in the new RSV, 1953, of the Bible. This revised version has the advantage of possibly even better Hebrew scholarship and more original manuscripts than was the case with the KJV. In the 12th verse of Genesis 1 in this RSV we read, "The earth brought forth vegetation, plants yielding seed according to their own kinds." Thus because of their fiat origin and of their reproductive behavior there was no natural way for evolution of new basic types to occur.

Some "Bible-believing" students of origins, those who could be called theists, will agree to the last sentence above with regard to *natural* processes, but hold that now and then down through millions of years the Creator caused organisms to bring forth unnaturally, i.e., supernaturally, so as to produce new basic types, and in this way derived the more complex from the simpler. That God *could* have done this the Bible-believing Christian will agree, but in the same breath he will point out that the Holy Scriptures know no such derivative type of origins.

III

Attempts at Classification Systems

The statement that the Creator commanded the earth to bring forth the plant "after its kind," and that the earth *did* bring forth the plant "after its kind," apparently means in part that He formed plants after some orderly plan. That this plan was not discovered by such plant taxonomists as either Adolf Engler, Charles Bessey, or John Hutchinson is quite clear. These taxonomists based their systems of plant classification,

upon which American floras and manuals were founded, on efforts to answer such evolutionist questions as the following, listed by G. H. M. Lawrence,¹ the Cornell taxonomist:

How are these plants related, . . . from what are they descended, . . . which characters are those of ancestrally more primitive plants and which ones are derived from them, . . . which characters have longest remained unchanged, . . . have characters arisen only once or have some arisen many times independent of one another?

These early botanists brushed aside the inspired account of distinctly separate beginnings of plant kinds and concluded instead that all basic types of plants are genetically related. The term "phylogeny," race history or development of a kind of organism, appeared in the literature as attempts were made to place together those families thought to be more closely related genetically, with assumed derivative groups following those taken for granted to be ancestral.

However, understandingly disappointing to these developmentalists, none of these efforts has produced a truly phylogenetic system. The bald truth here is that all the discoveries of plant paleontology have not revealed that which evolutionists are seeking; namely, evidence that truly primitive forms once existed. Therefore, the taxonomist is frustrated in not knowing which characters are primitive and which advanced. An acceptance of Genesis would have saved a vast amount of work through its revelation of the natural truth that there is neither "primitive" nor "advanced," but rather all basic kinds appeared simultaneously upon the earth.

In botany this attempt to follow the *ignis fatuus* of evolution has resulted in the three systems mentioned above, plus the system of Pulle of Utrecht, that of Skottsberg of Stockholm, and on to a total of at least a score of different classification systems which result in a great deal of confusion among those who would classify plants. The situation would suggest a return to a point of view at least very similar to that of Linnaeus—the noted father of taxonomy, a creationist. Even with *complete* avoidance of the concept of genetic relationship existing among basic kinds, almost endless interesting groupings and sub-grouping of plants can be made based purely upon comparative anatomy.

Right here possibly I should call attention to the fact that although it may appear that I have wandered from the area of form and structure into that of taxonomy, I am still on the subject of comparative anatomy. Plant classification systems are based entirely upon the form and structure of the plants, and according to our philosophy of comparative anatomy will be our procedure in the science of classification.

IV

Orientation for Bible-believer

The Bible-believing student of comparative anatomy of animals turns first to Genesis for the orientation necessary in laying the foundation of this subject. The translation of the Hebrew found in KJV, Genesis 1:20, is unclear in that it appears to state that both water animal and flying forms were brought forth *by the waters*, but in Genesis 2:19 we read that "every fowl of the air" was formed "out of the ground."

The Hebrew expression *sharats sherets*, translated in the KJV as "Let the waters bring forth," when accurately translated reads "Let the waters swarm with swarms. . . ." And with regard to the flying forms, Genesis 1:20 (RSV) correctly translates, "let birds fly above the earth." The Greek Septuagint states it thus, "every creature that flies with wings."

In other words, in Genesis 1 no statement is made regarding the material used in the formation of water animals and flying forms. However, it is made clear that on Day Five all water animals and flying forms were brought forth in all their kinds and were present abundantly at the close of Day Five. That they were shaped into discrete kinds appears to be a very important point.

Every water animal and flying form, whether starfish or mollusk, sponge or porpoise, jellyfish or whale, hummingbird or teratormis, butterfly or pterodactyl, all kinds were patterned according to their respective distinct morphological differences. No room is left for any supposition that these discrete kinds were derived from other kinds which were of more simple morphology.

The use of the expression *wayyibhra*, "and he created," Genesis 1:21, seems puzzling at first reading. Why should God *make* plants and *create* water animals and flying forms? The word for create may be used here for at least two reasons. First, verse 21 says that God caused animals to swarm in the waters without saying they were formed from any material. Therefore, a form of *bara*, to create, was used. Second, *bara* is used where the idea of novelty is to be conveyed (see Isaiah 41:20; 48:6, 7; 65: 17; Jeremiah 31:22). To bring into existence such remarkable creatures which breathe and are animated and can go where they wish is worthy of the term *bara*.

V

Original Dry-land Animals

In Genesis 1:24, 25 is recorded the origin on Day Six of the dry-land animals. In the origin of these creatures, as in the case of the plants on Day Three, we have a mediate creation. Instead of directly calling land creatures forth by His word, the Creator temporarily enables the earth

to produce them. The "why" we may not perceive, but we do know that they came from the dust and upon death return to the dust again. The command to the earth is *totse*, "cause to come forth." This command is quite identical with the statement in verse 12 regarding the earth "causing" the plants "to go out."

In the Scriptural account of the origin of land animals we are told that they appeared in three groups, each group name being in the singular, collective. First are the *behemah* or "domestic animals," which are often called cattle. The word *behemah* comes from a root meaning "to be dumb," thus giving dumb brutes. This characteristic does not serve to set any certain group apart, however, because all animals lack the power of articulate speech.

The second group are the *remes*, a word taken from a root which means "to move about lightly," or "to glide about." The translations in both the KJV and the RSV, "creeping things," is too narrow because it does not leave room for the larger land reptiles and amphibians. It would appear that *remes* includes everything that moves on the ground as snakes, or close to the ground as spiders and lizards.

The third group is *chayyath ha' a'rets*. The original comes from the root *chay*, "to live," suggesting vital energy and activity, then the modifying phrase "of the earth" is added. The members of this group are in a sense different from the other two groups because they have freedom of movement and may be designated as "wild beasts of the earth."

This classification of land animals was never intended to satisfy a taxonomically inclined biologist, but for men and women not trained scientifically it is satisfactory in that it gives a general, varied picture which is sufficient to call to mind all types of land animals. A point given the highest emphasis in the account is the fact that the Creator, obviously with a plan in mind which included all kinds of land animals, commanded the earth to produce these basic kinds. This part of the account closes, verse 25, with the assertion that all these kinds which were planned in the mind of God did take form instantaneously by His power without genetic relationship on Day Six. "And God saw that it was good."

VI

Origin of Human Beings

In a discussion of physical form and structure man most surely should be included. The account of man's origin occupies two verses in Genesis, verses 25, 26 of Genesis 1. The singular dignity of man and his position as the crowning work of creation is evidenced, first, by the divine council held before his formation; second, by the fact that he alone of the entire creation clearly

was patterned after his Maker.

The narration rises to a solemn chant in the words (RSV), "So God created man in His own image, in the image of God He created him; male and female He created them." The Lord Jesus Christ accepted this account of man's origin as simple history. In Matthew 19:4-6 (parallel reference Mark 10:6-8) He makes five allusions to the literal Genesis account of the origin of man.

The threefold use of *bara*, "create," in Genesis 1:27, is significant here. *Bara* is appropriate first, because, as in verse 1, something is brought into being which did not formerly exist; second, because, as in verse 21, something is being endowed with life and a soul; and third, because a creature with the endowments of man formed in God's image is entirely new.

It seems to come as quite a shock to some people to learn how like at least the higher beasts man is in his physical body. Albeit Genesis does tell us, Genesis 2:7, that man was made of the same substance as the animals, the dust of the ground. Furthermore, his food, Genesis 1:29, was quite identical to that of the beasts of the field.

He moved in the same physical environment, and in his living and in his work the mechanics of his activities was much like those of the higher animals. Thus man's comparative anatomy today does not coerce him into acceptance of a bestial origin, but rather harmonizes completely with the Biblical account of special creation.

VII

Creation Is Finished

It is clear in Genesis that God commanded the earth to bring forth plants (Genesis 1:11) and animals (Genesis 1:24). Just how long this command was to remain in force was apparently unclear in the minds of theologians of the Middle Ages. Whether it was failure to read the entire account of Creation week, or whether it was the result of confusion caused by an effort to accept both Aristotle and Genesis at the same time, it may be difficult to determine.

But history does tell us that these theologians, taught in the church universities (the only universities which were in existence during the Middle Ages) that spontaneous generation was a natural fact. The teachers in these universities, the schoolmen or scholastics as they were called, reasoned that God had commanded the earth to bring forth living organisms, so in their day the earth was understood to be obeying that command faithfully.

We marvel that these Bible students pondered origins as presented in Genesis yet in some strange way seem to have missed that part of the account found in the first two verses of Gene-

sis 2. Here we read, "Thus the heavens and the earth were finished, and all the host of them. And on the seventh day God ended his work which he had made (declared his work on which he was engaged finished); and he rested on the seventh day from all his work which he had made." The Septuagint expresses it thus, "And God finished on the sixth day his works which he made, and he ceased on the seventh day from all his works which he had made."

Thus we find that the Genesis account of the beginning of plants and animals not only very clearly portrays the work of the Creator in forming them in all their basic kinds on Days Three, Five, and Six, but, with equal clarity, it asserts that the Creator ended His work, a work of formation of basic kinds. Thus through divine revelation the Bible believer knows two most basically important facts about the world of living things: (1) God by fiat created the basic types in the beginning, and (2) By the fact that on Day Six God concluded His work of creation of basic types, there has been no addition of new basic kinds since Creation week through either spontaneous generation or megaevolution.

Through special revelation we know that God performed a great work, and that He ended that work. Since Creation week, except in a few very unnatural instances, e.g., possibly in the preparation of a great fish to swallow Jonah (Jonah 1:17) the earth's complement of basic types of plants and animals has not been augmented, but rather only diminished through the extinction of certain forms which could not adjust to new and more difficult living conditions following Noah's Flood.

VIII

Bible and Natural Diversity Harmonize

The present-day Bible-believing biologist is impressed most forcefully with the complete harmony which exists between the assertions of Genesis and the testimony of nature. Today we see the face of the earth teeming with a great diversity of plants and animals. Structural similarities may appear in many groups, and yet each basic kind stands as clearly cut as an island in an archipelago, with no connecting, interlinking bridges. Quite a number of years ago Theodosius Dobzhansky,² evolutionist zoologist in Columbia University, called attention to this in the following well-chosen words:

Organic diversity is an observational fact more or less familiar to everyone. . . . Indeed, a more intimate acquaintance with the living world discloses a fact almost as striking as the diversity itself. This is the discontinuity of the variation among organisms.

If we assemble as many individuals living at a given time as we can, we notice at once

that the observed variation does not form any kind of continuous distribution. Instead, a multitude of separate, discrete, distributions are found. In other words, the living world is not a single array of individuals in which any two variants are connected by unbroken series of intergrades, but an array of more or less distinctly separate arrays, intermediates between which are absent or at least rare.

This is the very picture given us at the close of Creation week. The land areas were verdant with plants in all their basic kinds from the lowly carpeting forms to the lofty trees, from the mighty redwood to the lichens on its bark and the delicate herbaceous forms blossoming prettily at its base. All kinds of animals swam in the waters, burrowed in the ground, crept, walked, and moved lightly over the land, climbed the trees, and flew through the air.

Organic diversity seemed the pattern of life, and yet as Dobzhansky observed, throughout the whole of animate nature is clearly visible the phenomenon of discontinuity. Man, chimpanzees, cattle, horses, dogs, cats, pigeons, roses, waterlilies, petunias, and sunflowers, each strikingly discontinuous from all others in its respective kind. Dobzhansky wrote me that because of this very discontinuity it is impossible to demonstrate evolution (megaevolution) among living plants and animals. To find a demonstration of megaevolution he said one must go to the fossil record.

Fossil Record Refutes Megaevolution

Albeit as one studies the reports of specialists in fossils he finds a unanimity of testimony which negates Dobzhansky's opinion. Because of the importance of this point, let us sample some of the assertions of the experts. With regard to plant fossils we read:

Chester A. Arnold³:

It has long been hoped that extinct plants will ultimately reveal some of the stages through which existing groups have passed during the course of their development, but it must be freely admitted that this aspiration has been fulfilled to a very slight extent, even though paleobotanical research has been in progress for more than one hundred years. As yet we have not been able to trace the phylogenetic history of a single group of modern plants from its beginning to the present.

G. Ledyard Stebbins, Jr.⁴:

Evolutionary conservatism and stability are much easier to demonstrate by means of fossil evidence than is rapid progress or the differentiation of the modern families and orders.

With regard to animal fossils, we read:

George G. Simpson⁵:

The facts are that many species and genera,

indeed the majority, do appear suddenly in the record, differing sharply and in many ways from any earlier group, and that this appearance of discontinuity becomes more common the higher the level, until it is virtually universal as regards orders and all higher steps in the taxonomic hierarchy.

The face of the record thus does really suggest normal discontinuity at all levels, most particularly at high levels, and some paleontologists (e.g., Spath and Schindewolf) insist on taking the record at this face value. Others (e.g., Matthew and Osborn) discount this evidence completely and maintain that the breaks neither prove nor suggest that there is any normal mode of evolution other than that seen in continuously evolving and abundantly recorded groups. This essentially paleontological problem is also of crucial interest for all other biologists, and, since there is such conflict of opinion, nonpaleontologists may choose either to believe the authority who agrees with their prejudices or to discard the evidence as worthless.

George G. Simpson⁶:

In spite of these examples, it remains true, as every paleontologist knows, that *most* new species, genera, and families, appear in the record suddenly and are not led up to by known, gradual, completely continuous transitional sequences.

D. Dwight Davis⁷:

But the facts of paleontology conform equally with other interpretations that have been discredited by neobiological works, e.g., divine creation, innate developmental processes, Lamarckism, etc., and paleontology by itself can neither prove nor refute such ideas.

Alfred S. Romer⁸:

The chances of obtaining a completely graded series (if one existed) are hence obviously vastly less than in the case of more normal phyletic evolution. "Links" are missing just where we most fervently desire them, and it is all too probable that many "links" will continue to be missing.

Norman D. Newell⁹:

From time to time discoveries are made of connecting links that provide clues to the relationships, as between fishes and amphibians, amphibians and reptiles, and reptiles and mammals. These isolated discoveries, of course, stimulate hope that more complete records will be found and other gaps closed. These finds are, however, rare, and experience shows that the gaps which separate the highest categories may never be bridged in the fossil record. Many of the discontinuities tend to be more and more emphasized with increased collection.

No Link Across Discontinuity

Thus we see that the same discontinuity which exists among living forms, and which Dobzhansky declared correspondingly made a demonstration of megaevolution impossible among these forms, also exists among the fossils. These gaps between fossil groups of organisms are not a figment of wishful thinking on the part of the creationist. But rather, the paleontological record, instead of demonstrating evolution as evolutionists repeatedly assert it does, manifests the very picture of fixity within the loci of the basic types, and manifests the absence of intergrading forms or connecting links that one would expect to find in nature if the Genesis account of origins were true.

We recognize that this discontinuity among the fossils does not demonstrate special creation of basic types, but it is in complete harmony with such an origin. The evolutionists, on the other hand, are constantly put to it to exercise more and more faith in their theory as it becomes progressively more obvious that intergrading forms necessary to suggest megaevolution are completely absent in just those places where they are needed most to bolster the theory.

It is of interest to observe that when evolutionists speak of discontinuity in the fossil record they occasionally say or infer that there are some cases among the fossils where connecting links between basic types do exist. But it is important to natural truth to understand clearly here that these situations cannot be shown actually to bridge between two basic types.

To illustrate, the *Archaeopteryx* is commonly given as *the* connecting link between birds and reptiles. Actually it would take many more forms than this one fossil curiosity to build the required bridge. The fact that the *Archaeopteryx* had some structures in common with both birds and reptiles does not necessarily mean more than does the fact that man has an eye very similar to that of the squid, and a humerus and radius and ulna in common with birds, whales, and bats.

Common origin indeed, but I would suggest that that origin was in the mind of a Creator with a master plan. Thus it is most likely that many supposed connecting links are, along with the groups they "connect," all members respectively of separately created basic types.

IX

"After Their Kind"

The Bible-believing scientist is very aware that according to Genesis there was a unit in the living creation specified as the kind (Hebrew, *min*). As we have already noted, according to the record, when the Creator commanded the earth to bring forth first plants and then animals,

it was not as if He were casting a net into a murky, unknown sea wondering the while what chance-developed forms might appear in it as it was drawn in.

The record states, in Genesis 1:11, 24, that the command to the earth was to produce these organisms *after their kinds*. In other words these forms were first conceived in the mind of God, and then at the fiat to the earth to bring forth, the Spirit of God (Genesis 1:2) working with the dust of the earth (Genesis 2:7, 19) produced from it the living forms patterned according to the plan.

Does it not seem reasonable to assume that if an omniscient God first planned the basic kinds, then produced these very kinds in the earth, it reasonably could have been in His plan that they continue in the earth as enduring entities? I would not go so far here as did creationist Georges Cuvier (1769-1832), founder of modern comparative zoology, and say that because God planned and produced these kinds they could not suffer extinction.

But, I would suggest that as long as these basic types could carry on, each would continue to be one hundred per cent the basic type it was created. At least it would be an astonishing thing if the Creator were meticulously to plan and produce all the delightfully variable basic forms and yet create them in such a way chemically that they could cross indiscriminately, and vary so widely in a few generations as to obliterate completely the original beautiful pattern of creation.

It does seem possible that today we should be able to look about us and at least in almost numberless cases recognize those original basic types which have endured to our day. "Kinds" were created. What sort of entities were they? The imprecise Hebrew word *min*, kind, appears ten times in the singular and/or plural form in Genesis 1. In the remainder of the Old Testament it appears twenty-six times more.

In Leviticus 11 (RSV) we find *min* applied respectively to the falcon, the raven, the hawk, the heron, the locust, the bald locust, the cricket, and the grasshopper. In Deuteronomy 14 (RSV) it is applied to the raven, the ostrich, the night-hawk, the sea gull, the hawk, the little owl, the great owl, the water hen, the pelican, the vulture, the cormorant, the stork, and the heron.

In Leviticus 19:19, *min* is used in so limited a sense as to refer to breeds of cattle as "kinds." In this same verse "kinds of seed," and "kinds of stuff" in a garment, are referred to. The remaining appearances of *min* are as follows: 1 Chronicles 28:14, "instruments of every kind; Nehemiah 13:20, "sellers of all kinds of ware"; Ecclesiastes 2:5, "all kinds of trees"; and Ezekiel 27:12, "all kinds of riches."

"Min" and "Baramin" Considered

Although *min* is an imprecise word, still in its thirty-six appearances in the O.T. it is never used so broadly as to suggest that the originally created kinds may have been groups as extensive and inclusive as to refer to the hairy, the scaly, or the feathered animals. It actually is used quite specifically, in fact so specifically at times as to refer to breeds of cattle, or to distinguish a "locust" from a "bald locust," a "little owl" from a "great owl." In the light of this usage it seems valid to assume that there is no single category in modern taxonomy which corresponds to the Genesis kind.

As we have noted above, the testimony of Genesis is that, with regard to the plants, "The earth brought forth vegetation, plants yielding seed according to their own kinds."—Genesis 1:12 (RSV). In other words, interestingly the designated distinguishing characteristics of the Genesis kind was physiological (chemical, i.e., potentially genetical) rather than merely morphological. It seems reasonable that we may assume that the same was true regarding the animals.

Because our modern taxonomies have largely been built upon morphology interpreted evolutionistically while the Genesis kind seemed to me to be in physiological unit, in 1941 I suggested¹⁰ that the Genesis kind today be called *baramin* (coined from *bara*, created, and *min*, kind—plural form *baramins*) (discussed more fully in Marsh^{11,12}) and that the laboratory test of the baramin be the achievement of *true fertilization* between the sex cells of the mated individuals.

In other words, if on the fertilization of the egg, both male and female chromosome complements took part in the formation of the first two blastomeres, then the mated individuals were members of the same *baramin* (i.e., assumedly, Genesis kind). Some creationists, however, believe that just as in mankind, only those varieties and "species" which are fully interfertile may safely be considered as genetically related.

After studying hybridization during the twenty-eight years which have passed since 1941, I still suggest true fertilization as a concrete test of the Genesis kind among sexually reproducing organisms in our present day. Plants and animals apparently have remained true to the law of their creation and we look about us today upon an intriguing scene of striking, **clear-cut discontinuity**.

X

Fixity in Nature Discussed

Perhaps it would be well here, in our consideration of modern form and structure among living things, to pause a bit longer on the point

of fixity in nature. Bible-believing scientists generally agree that fixity is implied in the Genesis account-of origins. Differences of opinion might arise with regard to the level at which fixity has existed.

During the Middle Ages the schoolmen in the church universities taught the amazing doctrine that according to Genesis there could be no variation from generation to generation among plants and animals. According to this scholastic view reproduction was quite similar to the minting of coins in which the coin is very like the die which stamps it.

This narrow, extreme interpretation of the meaning of a creation after their kinds was still taught in Cambridge when Charles Darwin was a theological student there in the late 1820's. Apparently Darwin left the interpretation of Genesis to the professors in theology at Cambridge, and started on his five-year voyage around the world, 1831-36, with the belief that according to Genesis God had created plants and animals and set them in the earth in the very forms of their 1831 appearance and in the location in which he found them in 1831.

However, as Darwin proceeded with his careful study of the flora and fauna of islands and continents, the fact was forced upon him that not only had organisms moved over the earth, but, while engaged in this migration, they had also changed somewhat in their appearance. To illustrate, most of the islands of the Galapagos group were populated each with a different variety, or even "species" of tortoise and finch. The whole picture was not one of fixity as to location and form, but rather one of migration with variation.

These careful observations troubled Darwin deeply because he thought they were contrary to Genesis. After years of mental conflict over this problem, he finally decided that Genesis must be wrong. In 1844, in a letter to his friend the botanist Joseph Dalton Hooker, he wrote,¹³

I have read heaps of agricultural and horticultural books and have never ceased collecting facts. At last gleams of light have come, and I am almost convinced (quite contrary to the opinion I started with) that species are not (it is like confessing a murder) immutable.

Inaccurate Interpretation of Genesis

Even in our day it is generally understood by the man on the street and by most scientists that Darwin disproved Genesis. Actually all he disproved was the **inaccurate** interpretation of Genesis **by the schoolmen**. The tragedy here for both the religious world and the scientific world lies in the failure of Darwin to recognize that his *observations* were completely in harmony with Genesis.

Genesis does teach a fixity in the living world. However, many scores of years of careful biological research by innumerable scientists has shown that this fixity is higher than the individual level, i.e., it exists at the level of the basic kind, best illustrated perhaps by our own species, mankind.

In all their wishful endeavors in scientific study, even evolutionists will admit that not one instance of a basic type, like a cat, producing a new basic type, like a dog, is known. We have kinds of cat, but the fixity of Genesis is at the higher level of the cat kind, and not at the lower level of kinds of cats.

Variation does occur abundantly **within** kinds, but no coercive, compulsive evidence can be produced to show the production of even one new basic kind. The very most that Darwin could discover was that new varieties of tortoises had apparently developed on the various islands of the Galapagos group, and apparently new varieties and even new "species" of finches.

However, Darwin failed to recognize the tremendously important fact that the tortoises were still tortoises and the finches still finches, field evidence which helps us to understand the true fixity that exists in the world of living things. In his demonstration of variation within well-marked limits of the basic kind, Darwin, instead of disproving Genesis, as he thought, actually witnessed to its veracity.

One basic kind is unlike all other basic kinds because of its own peculiar internal chemistry, the DNA of its genes. If different kinds are present we know these different chemistries are present also and effectively isolate one kind from another by bridgeless chemical abysses.

XI

Evolution Micro-, Mega-, Macro-

It is interesting that apparently the first use of the word "evolution" in biological literature was made by the Swiss creationist naturalist Charles Bonnet (1720-1793). He was a proponent of the encasement or preformation theory of embryonic development of man. According to this view, at the time of creation all future generations to live upon the earth were formed at the same time the first individual was caused to appear.

Thus in the germ cells of either Adam or Eve, depending upon whether the theorist was a spermist or an ovist, were created in successively smaller globules of protoplasm, all future generations, each encased in the generation that was to precede it. When the right time came, the tiny homunculus would gradually unroll into its adult form by a process of "evolution." Thus we find that the first use of the word "evolution" apparently was in connection with one of the most ex-

treme concepts of special creation yet to be championed.

In our day the issue of origins of types is considerably clouded for the man on the street, and even for some biologists, by the appearance in the literature of the two terms microevolution and *megaevolution* (also called *macroevolution*). Then when the reader learns that believers in special creation accept "microevolution" but refuse "megaevolution," the confusion deepens. It is important that the two be defined.

Microevolution is the term applied to the demonstrable production of new varieties or breeds *within* any basic type.

Megaevolution, on the other hand, is the term applied to the doctrine which holds that, if given enough time, basic types can eventually, through natural processes, produce new basic types.

Generally when "evolution" is referred to, megaevolution is meant. To illustrate, a belief in megaevolution teaches that man has developed upward through the beasts and is genetically related to them, i.e., physically at least, man is a noble beast. In other words, megaevolution refuses a literal Bible because according to the Scriptures man was formed from the dust (Genesis 2:7), in the image of God (Genesis 1:27), and consequently is the son of God (Luke 3:38). Scripturally man has received not even one molecule of hereditary DNA from the animals.

Thus, by and large, it is unfortunate that demonstrable variation has been named a sort of evolution, because the special creationist who accepts all demonstrable variation does not accept the theory of evolution. He can accept microevolution because variation has never been shown to do more than produce a new breed, variety, species, or group of individuals, within a basic type which was *already on hand*. A cow may bring forth an Aberdeen-Angus, an Africander, an Ayrshire, a Brahman (Zebu), a Brown Swiss, a Devon, a Galloway, a Gaur, a Gayal, a Guernsey, a Hereford, a Holstein-Friesian, a Jersey, a Shorthorn, or even a Catalo, but this is only microevolution because these are all undisputably merely breeds of the cow kind.

A fertilized corn ovule may develop into dent corn, flint corn, sweet corn, pop corn, starch corn, or pod corn and still accomplish only microevolution because these are all unquestionably merely varieties of the corn kind. Microevolution may even go so far as to make a new "species" possible by selective breeding as demonstrated by Kozhevnikov,¹⁴ or to change a race into a new biological species as explained by Dobzhansky.¹⁵ As far as demonstrable evidence goes reproduction and reproductive behavior of every type can never accomplish megaevolution.

Microevolution Is Not Megaevolution

A common practice of evolutionists is to marshal many illustrations of microevolution and represent that all this process needs to accomplish megaevolution is just enough time. This assumption can never be shown to be true, because one of the most completely demonstrated principles of biology is the one which states that all processes of variation among plants and animals can do no more than produce another variety within a basic type which *was already in existence*.

This extremely basic and important principle has been overlooked by biologists due to their obsession of megaevolution. The following caution by evolutionist G. A. Kerkut¹⁶ is apropos here:

It might be suggested that if it is possible to show that the present-day forms are changing and evolution (microevolution) is occurring at this level, why can't one extrapolate and say that this in effect has led to the changes we have seen right from the Viruses to the Mammals? Of course one can say that the small observable changes in modern species may be the sort of things that lead to all the major changes, but what right have we to make such an extrapolation? We may feel that this is the answer to the problem, but is it a satisfactory answer? A blind acceptance of such a view may in fact be the closing of our eyes to as yet undiscovered factors which may remain undiscovered for many years if we believe that the answer has been found.

Two very influential books in recent years have been the beautifully colored Life Nature Library volume, *Evolution*, by Ruth Moore and the Editors of *Life*,¹⁷ and the even more beautifully colored and produced volume, *Atlas of Evolution*, by Sir Gavin de Beer.¹⁸ The impressive demonstrable evidence which fills these volumes is *microevolution only!!*

The script which directs the mind to megaevolution is purely philosophical. If you will believe the narrator is telling the truth you can become an evolutionist. It will have to be an act of faith, because actually every example given makes still more clear the great biological truth that all variation, naturally or artificially produced, can result in *nothing basically new*.

What is the significance of similar form and structure? Does it indicate genetic relationship? No. The Bible-believer, through a faith supported by the very real discontinuity of living forms in the living world and among the fossils, sees a work of special creation of basic types which are related only through having originated in the mind and by the command of the same Creator.

XII

Logical Is Not Biological

It is a point of interest to the creationist that the evolutionist begins by building his doctrine upon the truism in biology that "like produces like." From the assertions of Genesis, the creationist knows of the nearly simultaneous origin of all the basic types of plants and animals, and experience has shown both creationist and evolutionist that these basic types bring forth after their kinds.

Both would be flabbergasted if a sparrow were to produce a warbler, or if a rose produced a geranium. Reproductive isolation, even among sympatric kinds, is the natural way of life. As far back as records go, no basic kind has ever been known to produce a new basic kind.

Nevertheless the evolutionist pushes on past natural fact and insists that the only assumption he makes is no more nor less than a *logical extension* of what biologists consider a truism or self-evident fact, namely, that fundamental structural resemblance signifies genetic relationship; that generally speaking, the degree of closeness of structural resemblance runs parallel with closeness of kinship. The evolutionist realizes that if he cannot rely upon this assumption which he garners from the area of comparative anatomy, an assumption which he may call the principle of homology, he can make no sure progress in any attempt to establish the validity of the concept of evolution.

The developmentalist as well as the creationist relies upon the fact of heredity in everyday life. He plants a certain kind of seed and expects to get a certain plant. When breeding a certain kind of dog he expects offspring of the same breed. The production of like by like is a natural law of biology. When working with the realities of nature we know that there is no exception to the fact that a basic kind can never do other than produce more of its own kind.

And yet, evolution flies in the face of nature and builds upon the unnatural assumption that at many times in the past, basic kinds have produced something basically new. That is the only way new basic kinds could arise, and yet nature has not the mechanism to perform such unnatural acts.

Informed scientists know that the production by a basic kind of plant or animal of a new basic kind may be a *logical extension* of a truism in biology, but it is not *biological*.

Thus the evolutionist theorizes from simple to complex or specialized by recourse to assumed unnatural and apparently impossible behavior, while the creationist sees the basic types taking form in one literal week through supernatural acts of a transcendent Being. The very real dis-

continuity throughout nature supports only the view of the creationist.

XIII

Resemblances and Genesis Kinds

Do form and structure furnish a key to membership in Genesis kinds? No closer kinship can be imagined than that which exists between identical human twins. Careful statistical studies to determine the exact degree of their resemblances to one another have been made on over two hundred sets (see Newman¹⁹), revealing the rather startling fact that on the average they showed a coefficient of correlation of over .93 (i.e., 93 per cent) identical. The only structural resemblance belonging to this order of closeness is that existing between right and left halves (i.e., antimeric) of a single individual, such as the two sides of our face, or our two hands.

The next degree of resemblance is between brothers and sisters, who are only fifty per cent identical. Cousins of various grades have proportionately lower and lower degrees of resemblance in exact keeping with their relative degree of kinship. Thus it may be expected that among the descendants of any original kind, similarity of form and structure to the extent of distinguishing, for example, a cow kind of animal from a horse kind, will certainly exist.

How can we distinguish a horse from a cow? The evolutionist and the creationist both resort to a cluster of bodily characteristics in each case as distinguishing marks of membership in these respective kinds.

According to Genesis, resemblances among members of the bovine kind may indicate blood relationship, but resemblances between members of the bovine kind and the equine kind, for instance, are not indicative of genetic continuity between them. The evolutionist, employing in a broad way what he calls the principle of homology, takes in his words, "a short step in logic"²⁰ beyond actual performance in nature, and assumes that two somewhat similar basic kinds have been derived one from the other or both from a common ancestral form. In other words, he feels so strongly in the matter of physical resemblance as to declare Genesis wrong when it states that all basic types were created independently of each other.

Nevertheless, even very intelligent, well-informed, and self-satisfied scientists must realize that blood relationship is not the *only* logical, reasonable explanation of physical resemblance. Is it not equally reasonable that the Creator could form a man and a chimpanzee so alike anatomically as to make it possible to work out both of their minute anatomies from the same dissecting manual, without having to derive them from a common stem ancestor?

It is explained to us that it is *logically* impossible to draw the line at any level of organic classification and say that structural resemblance is the product of heredity up to such and such a level, but that beyond this arbitrarily chosen point heredity ceases to operate. It would be wise to introduce this statement by saying, "To the evolutionist it seems logically impossible . . ." and so on, because human logic is very possibly imperfect, and the facts of creation very likely may not coincide with it.

For that very purpose, in this matter, the Bible was given to man to guide in the formulation of his philosophy, and behold human logic is wrong if it demands that resemblance is the key to genetic relationship. The omniscient Creator stands in need of no apologist in those instances where His works do not check out with human logic.

XIV

Resemblances and Evolutionist "Footwork"

It is an interesting diversion to the creationist to see the skillful mental footwork of the evolutionist as he attempts in some cases to argue that resemblance indicates genetic relationship while in other cases it does not. This is the area of homologous structures, analogous structures, convergence or parallelism of form, and adaptive radiation.

Homologous structures are defined by evolutionists as those that are similar in anatomical detail and in their mode of embryonic origin, irrespective of whether they perform the same or different functions. Of course homologous structures are demonstrable and are as real to the creationist as to the evolutionist. However, the evolutionist's conclusion that homologous structures represent the same hereditary units and have been derived from the same or similar ancestors is pure speculation, and because in principle it is contrary to Genesis it is refused by creationists. Such structures reveal the ingenuity of the Creator in adapting the same basic anatomical pattern to different uses.

Structures which are superficially alike in form or in function, usually in both, though anatomically quite different, are said by the evolutionist to be analogous. These structures can be shown in the laboratory to be entirely different in their embryonic derivation. Examples here are furnished by the three aquatic vertebrates, the shark, the ichthyosaur, and the porpoise, all of which have, or had, the same fusiform body, median, paired, and caudal fins, and all swim, or swam, in the same way.

Because one is a fish, one a reptile, and one a mammal, the evolutionist holds that they do not have the same genetic continuity. In such examples the evolutionist sees what he thinks are

strong evidences of descent with modification, while the creationist is delighted with the ingenuity of the Creator in adapting different animals, on the same day of creation, to the same specific environment.

Creationists and evolutionists should be pleased whenever they can agree upon the same interpretation of certain natural facts. The phenomenon of analogous structures is one of these uncommon instances. Both agree that structural resemblance of this type does not indicate blood relationship even though superficially they are quite similar. Because of this superficial resemblance, evolutionists refer to such cases as illustrating, in H. F. Osborn's words, "the law of convergence or parallelism of form."²¹ The thought is that these different lines of organisms have gradually adapted themselves through time to the same environment until they have finally reached a stage of physical resemblance which might seem to indicate genetic relationship,—an interestingly different conclusion than that reached by evolutionists regarding homologous structures.

Additional examples of "**convergence**" are found in the fact that running animals generally have in common, long legs, and a tendency to stand on the toes. The toes may be reduced, as to one toe in the horse. Climbing animals are all provided with clinging appendages of some sort, including such structures as hooked claws, prehensile fingers or tail, suction pads on the feet, and other similar adaptations. Burrowing animals as a rule have an extra-heavy shoulder girdle and strong fore limbs with heavy gouging claws.

The evolutionist adroitly speculates that such resemblances do not indicate blood relationship within each ecological group, but he still pleads for evolution in the speculative assertion, "Analogous structures, while not considered as evidences of kinship, are strong evidences of descent with modification, for their very existence implies that they have changed from a former condition to one in which they are adapted to a new medium."²² This illustrates well what imaginative interpretation can do among demonstrated facts.

Adaptations: Primary and Secondary

In the matter of adaptive radiation there is always the problem of just how far it can be demonstrated in nature. The creationist accepts demonstrated facts, but in this area where does demonstration end and speculation begin? Often we see in organisms a remarkable capacity for individual adjustment to special conditions. Not only may the organism be amazingly well fitted for the average conditions of its environment, but, likewise, it may be able to adjust itself to

relatively wide variations from the optimum condition.

In making these adjustments the organism may respond with changes in its physical body, such as assuming white pelage in winter, or grow a thick, rough coat of long hair in cold weather and a short-haired, smooth coat in summer. Or some plants will grow entire leaves when well-watered, and develop only spines when growing under dry conditions, as in the European gorse.

Thus to a certain point adaptive radiation may occur. Possibly Darwin's finches on the Galapagos Islands are an actual case of such radiation in which one kind of bird has become adapted to special environmental factors, until its varieties came to occupy all the ecological niches of the islands from ground to tree and eating both plant food and insects.

But it is extremely vital to keep in mind that adaptive radiation has not been demonstrated to produce more than varieties or breeds within their respective kinds. These birds that Darwin studied on the Galapagos, whether eating cactus seeds on the ground or amazingly pursuing worms in a tree limb with a cactus thorn^{23,24}, had accomplished nothing more than new varieties of one finch.

The demonstrable facts do not verify the concept that because all tetrapods (land vertebrates, except snakes) have the same three bones in their forelimb they must have experienced adaptive radiation into their present form and structure from a primitive form by changes in proportion, fusion of parts, or loss of parts. The statement of Genesis that God created the basic kinds in one literal week rules out all such imaginings.

All *primary* adaptations, such as the fitness of the fish for the aquatic environment, and the squirrel for the arboreal environment, were made in the beginning. *Secondary* adaptations, more or less minor adjustments since creation, accomplish nothing more than possibly to produce new varieties in basic kinds already in existence.

That the area of comparative anatomy is declared by evolutionists to be "one of the most important fields of evidence for evolution,"²⁵ is truly no recommendation for the doctrine of evolution. That "short step in logic" necessary to invoke assumed natural forces which can produce morphological changes adequate to the job of bringing a new basic type into the natural world carries megaevolution out of reality into the world of make believe.

Like *does* beget like, but in actual performance this truism holds only so far as true genetic continuity can control the quality and quantity of likeness. Endless cases of objective proof demonstrate that blood-related likeness ends with the periphery of the locus of the basic kind.

On the other hand, where pigeons and chickens resemble one another the explanation lies not in even distant blood relationship, but in the fact that at creation the Creator chose to place in each respective complement of DNA those specific chemical adjustments which would produce these similar characteristics. This point of view does not arise through mere speculation, but rather from the record about the origin of kinds of organisms recorded in Genesis 1 and 2.

XV

Diagrams and Classification

The great problem of classification of plants and animals still stands as a mighty challenge to the biologist. References to this science always appear frequently in a discussion of form and structure, because they constitute the basis for all classification systems attempted so far. The father of modern taxonomy, the creationist Carolus Linnaeus, during the most active period of his life, *assumed* that the groups he called species were the created units, and for convenience in his work with plants he used the sexual parts of flowers in a purely artificial classification system.

He experimented with map-like diagrams, but he found that no arrangement he could make would always place similar forms together and separate dissimilar forms. For this reason such diagrams never gained much popularity as summaries of taxonomic data.

In their pursuit of a means of expressing their findings diagrammatically, taxonomists next tried to arrange living forms on a ladder-like figure—a ladder which attempted to include everything from amoebae to archangels, based on the *assumption* that the adaptation of living things is progressive so that any particular animal should be preceded by one somewhat lower in the scale of life and followed by one somewhat higher in this scale. This worked fairly well for the fishes, the amphibians, and the reptiles.

However, the series cannot continue on with the birds and mammals because the majority of birds are in every respect quite as “high as the majority of mammals, thus requiring two rungs at the same level of the ladder. This type of dilemma is repeated frequently not only among higher forms, but even more frequently in the lower levels of classification.

Third Type of Diagram Proposed

This need for parallel rungs at many levels soon suggested a third type of diagram, one in the form of a tree. This invention delighted evolutionists because they *conceived* that, as in the case of the tree, a development of organisms had occurred from one, or a very few, simple sources, the growth being accompanied by branching and differentiation.

Albeit they recognized that unlike the growth

of a tree, the processes of branching and differentiation were not amenable to direct observation. Faith and imagination had to supply all of the phylogenetic tree except its branches and twigs. For that reason the evolutionist’s tree of life is really a great intellectual curiosity, or even monstrosity, because the very real basic types appear on this “tree” with no demonstrable, i.e., real, connection or support.

Developmentalists experience considerable confusion and difference of opinion as they try to attach the real branches at the assumed proper places on some assumed main branch or on the assumed trunk. The creationist would suggest that they drop this losing game and place a Creator in the central vacuity of their tree of life as the originator of all basic types.

The demonstrable discontinuity in the world of living things dooms the evolutionist’s tree of life, at least in the sense that all the basic kinds have developed from a distant common ancestor and are therefore blood related. It would appear that the field for the development of a classification system based upon the truth of Genesis is still wide open.

Creationists do not speak of *one* phylogenetic tree, but they do consider a whole forest of smaller or simpler trees. Each tree would represent one basic type, and in some cases at least a considerable tree appears, as clusters of forms whose individuals will hybridize are studied. The cabbage, for instance, apparently may have varied so widely within its basic type as to shape into a very intriguing tree. The same is true more or less with most of our domesticated plants and animals. What a delightful complexity if we were to unravel the phylogenetic tree of even one of our choice roses!

XVI

Comparative Anatomy and Archetypes

Certainly a discussion of comparative anatomy from the point of view of the special creationist would be seriously lacking if no mention were made of Linnaeus’ theory of archetypes. The term “archetype” springs from the Latin *archetypum*, which refers to an original pattern or plan from which an object is made or formed. Appearing as a synonym is the word *prototype*.

Linnaeus’ theory of archetypes assumed that the Creator worked from a series of plans, the archetypes, which were limited in number. These archetypes fell into clear-cut, classifiable categories. In his system of classification he recognized only classes, orders, genera, and species. The class would correspond to a major archetype while the various orders within a class would be lesser archetypes, and so on down the hierarchy.

This theory seems very reasonable, and yet one which, if employed by the Creator, was by no

means used in every case. Among mammals it is possible to explain that often both males and females have nipples because of a creation which employed archetypes. Possibly a wider application of a model may appear in animals which have either a nictitating membrane or a fold (called the *plica semilunaris* in man) at the inner angle of the eye. However, pitfalls lie all about in this area.

Speculation takes over when we study such instances as the fact that although the dandelion produces abundance of pollen, still this pollen is all sterile. Is this due to the adherence of the Creator to a plan which required that certain flowers shall have both stamens and pistils even if the anthers produce only inviable pollen, or has mutational change occurred here since creation?

In the case of certain blind cave fishes the creationist Louis Agassiz was of the opinion that the Creator had created them blind and placed them in caves in that condition where we find them today.²⁶ In that case the non-functional optic nerves which are present in certain of these fish (*Amblyopsis*, *Typhlichthys*, and *Troglicthy*^{27,28}) would be mere extraneous structures due to the Creator's adherence to a type which required optic nerves. Or is it not more likely that in such instances the eyes, including the distal portions of the optic nerves, have suffered from mutation at some time since creation?

Cautionary Word About Archetypes

When pondering the matter of archetypes care must be used not to fall into the dogmatic position of evolutionists who affirm that, if special creation occurred then the Creator *must* have used archetypes throughout, and if He employed such models then He would be obliged to use them *in every pertinent ease*. Man should be very cautious in conjuring up supposed courses of procedure which he assumes a Creator would be required naturally to follow if basic types arose by special creation. This evolutionist activity of building up straw men and then gleefully tearing them apart must present a rather pathetic picture to an omniscient Creator.

In our study of comparative anatomy we are delighted to find instances where the Creator appears to have employed archetypes rather broadly. But at the same time we are pleasingly diverted to discover in another animal a surprise use of some other invention of form or structure for the same purpose, a different structure which appears to exist for the sole end of introducing variation.

Nature is replete with the employment by the Creator of so many ways of providing motion for animals immersed in water, for locomoting over dry surfaces, for moving freely through the trees, for flying through the air, and on *ad infinitum*. General plans such as archetypes present

a restful, stabilizing organization in nature, and at the same time the variations which appear at every hand add a zest to nature study which prevents ennui and tedium.

The more one familiarizes himself with the structural forms of plants and animals the nearer he draws to the conclusion that the Creator takes great delight in variation. A creation of man in the image of God seems to include an endowment with the capacity of thoroughly enjoying this delightful diversity supplied so bountifully in the form and structure of living things.

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