THE CONCEPT OF HOMOLOGY

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The concept of homology, in the historical sense, was defined in ***The Origin of Species*** *by Darwin as "recognition of fundamental plan in animals and plants is due to descent with modification." Inheritance of successive slight modifications from a common ancestor was very likely a reaction to the extreme view of the immutability of species held in Darwin's times. This paper seeks to show that it is neither hopeless nor unscientific to attribute a common plan or a basic pattern of a Creator to the similarities shown by the forelimbs of vertebrates.*

A review of recent and widely adopted high school textbooks in biology shows that homology in the Darwinian sense is still being offered as "proof" of evolution. Recognition of the rapid inroad of evolutionary teaching into our educational system to the complete suppression of creationist viewpoints calls upon scientist and non-scientist alike to lead in a return of the data of the natural sciences within creation guidelines.

Introduction

This paper will present some of the historical background for the concept of homology as expressed by Darwin and Huxley, as well as some rebuttal to the concept that was made even in their day. Also consideration of some recent textbooks, both on the college level as well as that of the high school, will be presented in order to show the generally accepted premise that this concept affords "evidence" for evolution. I believe that it is time that scientists on the frontiers of research as well as those on the frontiers of teaching should be heard from on this important subject.

Homology is defined by Webster as the correspondence in type of structure between parts or organs of different organisms due to differentiation by the process of evolution from the same or corresponding part or organ of some remote ancestor. Included in support of the definition is mention of the relation in structure between the arm of a man, the foreleg of a horse, and the wing of a bird as typical examples of homology.

Homology, at least historically, was emphasized more in the animal than in the plant kingdom. So far as the former goes, it belongs to morphology, specifically in the field of comparative anatomy, though some have stressed it even in the discipline of embryology.

But I have seen little research recently in comparative anatomy; in fact, many medical schools have now dropped it from their requirement for entrance, and many universities and colleges are no longer teaching the subject. Could it be that it is simply so obvious, so much a commonplace observation, that animals should have certain resemblances—and that therefore, comparative anatomy is merely the pointing out of the commonplace? Furthermore, is it not because existence of similarities is dependent upon the preference of the investigator?

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And the reader might ask, hasn't the idea of homology been abandoned generally, at least as favoring the theory of evolutionary origins of living things? As one of the oldest arguments usually offered in favor of evolution, isn't it by now pretty well outmoded and relegated to a former generation of thought?

But with these questions asked, I find, as a teacher interested in good teaching, that in nearly every textbook of biology, the subject matter of the concept of homology is presented with the same overtones that it has always carried, with the same special pleading for the case for evolution. What about recently published books?

The advertisement for William T. Keeton's, *Elements of Biological Science,* states that the author has, "an undogmatic approach throughout that stimulates student interest through emphasis both for and against scientific conclusions." I was, therefore, anxious to find whether or not the subject of homology was presented, and in what fashion. Keeton[1] writes:

> Systematists, then, when they are studying similarities between two species, must determine whether the similarities are probably *homologous* (inherited from a common ancestor) or merely *analagous* (similar in function and often in superficial structure but of different evolutionary origins). Thus the wings of robins and those of bluebirds are considered homologous; i.e. the evidence indicates that they were inherited from a common avian ancestor with wings. But the wings of butterflies are only analagous because, though they are functionally similar structures, they were not inherited from a common ancestor but, evolved independently from different ancestral structures.

And so, patiently and with forbearance, as Dr. Evan Shute[2] so fittingly writes, "the evidence pro and con must be presented for dispassionate analysis once again," because the textbook author has not done so for his readers.

(As for the undogmatic approach, I came across this most amazing statement in the Keeton book: "Whales, which are mammals descended from terrestrial ancestors, have evolved flippers from the legs of their ancestors; those flippers superficially resemble the fins of fish, but the resemblances are due to convergence and they do not indicate a close relationship between whales and fish."[3])

Surely, teachers must evaluate for the student such dogmatic statements as are contained in the above, *viz.*, that "whales . . . are mammals descended from terrestrial ancestors" and that they have "evolved flippers from . . . legs." It is often difficult even for students in college to see the fallacy behind this sort of statement. Thus, the point that I want to get across right here is that homology, and the argument from vestigial organs, are still presented to students of biology as a proof for evolution!

Just how is it that whales are thought to have "evolved" from land mammals? I have rarely seen an explanation by evolutionists for this amazing phenomenon, but I came across the following passage in the writings of the late Douglas Dewar, whom it was my privilege to visit once at his home in England, at Hindley-on-Thames, while I was serving after the war as a missionary in Germany:

> A delightful example of this occurs in the late Sir J. Arthur Thomson's *Biology for Everyman.* He tells us that whales are descended from land animals that took to the water. He writes, "We may begin with an animal like the stoat that occasionally jumps into the water and swims well. The next step may be illustrated by the otter, that is thoroughly at home in the river and may swim for miles out to sea, yet remains equally at home on land. On the next level may be placed the almost exterminated sea-otter *(Enhydris)* of the North Pacific, whose hind feet are suited only for swimming. Then we reach the progressive series represented by sea-lion, walrus, and seals—the last being almost as thoroughly aquatic as the, whales, except they bring forth their young on the shore and nurse them there."[4]

And then Dr. Dewar, in his own terse manner, dismisses all this with one thrust as he wrote, "The above passage, while in no way resolving the difficulty of the transformation of a land into an aquatic mammal, contains the fallacious assumption that evidence of the transformation is afforded by the fact that some existing mammals are more aquatic than others."[5]

Historical Background of Homology

But so much for the supposed transformation of land animals into whales. Surely the concept of homology is very old; certainly it is neither new nor modern. Perhaps no one knows exactly when it was first put forward, but it was used by Darwin in *The Origin of Species* to support and bolster his doctrine of evolution. He speaks of the matter in these memorable words:

> What can be more curious than the hand of a man, formed for grasping, that of a mole for digging, the leg of the horse, the paddle of the porpoise, and the wing of the bat, should all be constructed on the same pattern, and should include similar bones, in the same relative positions?[6]

We see in this statement how incredible it seemed to Darwin—the simple fact of the correspondence of parts between the fore-limbs of vertebrates. But we must remember that in the days when Darwin wrote the climate of the times was totally on the side of the absolute immutability of species. R. E, D. Clark, in his chapter, "Before Darwin," makes this quite clear.

> In the eighteenth century, Linnaeus (1707-1778), the great systematizer of zoology, became profoundly convinced that species were immutable. His belief, founded upon direct observation, was unshaken by the anatomical resemblances which he so frequently found to exist between different animals. There are, he claimed, "just so many species as in the beginning the Infinite Being created . . . biologists, too, had come to believe in the absolute fixity of species.[7]

To the complete overthrowing of such narrow concepts of immutability came the *Vestiges* by Chambers, in 1844, some years before Darwin went on the Beagle or published his notes. The tone of this revolutionary book was thoroughly evolutionary, but devoutly "Christian." Darwin, it is thought, was greatly influenced by the book.

Thus the climate of opinion by 1859 was right for the overthrow of one extreme view–the absolute immutability of life forms—to the acceptance of another extreme view—that *all* organic forms have changed, and changed considerably! We have seen, in the last hundred years, the pendulum swinging back again to a more sober approach upon the part of creationist science, at least.

Many of Chambers' arguments (such as the absurd acceptance of the supposed close relationships between sea weeds and men and frogs, and the strange idea of recapitulation, later so overworked by Ernst Haeckel) were avidly adopted by those who were looking for a means with which to meet theologians who accepted species immutability! The difficulty, then, was that men of science, who believed in God's revelation, often contended for Him on too narrow a basis! Some still continue to do so.

Homology Per Darwin Examined

To get at the real issues behind the concept of homology, at least as it was first conceived, it is worthwhile to go back to the source-book of evolution *(The Origin)* and find out just what Charles Darwin said about it. And we shall be concerned, not only with what he said about the nature of the similarities between organic beings -their morphology or comparative anatomy, but also the "why" of such homologies. He speaks of homology in these words:

> Nothing can be more hopeless than to attempt to explain this similarity of pattern in members of the same class, by utility or by the doctrine of final causes. The hopelessness of the attempt has been expressly admitted by Owen in his most interesting work on the *Nature of Limbs.* On the ordinary view of the independent creation of each being, we can only say that so it is;–that it has pleased the Creator to construct all the animals and plants in each great class on a uniform plan, *but this is not a scientific explanation.*[8] (Emphasis added)

We see from this quotation, then, that Darwin could never quite dispense with the idea of a Creator-God; in fact it troubled him until the hour of his death. It is true, of course, that the celebrated anatomist of that time, Richard Owen, did maintain, as many creationist scientists do today,[9] that such similarities as we see in animals and plants about us are due to a common Plan or a common Design of a Creator.

However, Darwin, and indeed most modern evolutionists, will have nothing of this for an explanation. It is, they say, not scientific! How often do I hear high school students, and even some in the lower grades, expressing these same doubts, which very likely they have learned from their teachers, who have graduated from universities, where they have been indoctrinated into the "religion" of biology, i.e., evolution!

Instead of "the independent creation of each being," the concept of absolute fixity of species which was forced upon Darwin, we have this "scientific" explanation offered by Darwin:

> The explanation is to a large extent simple on the theory of the selection of successive slight modifications, -each modification being profitable in some way to the modified form, but often affecting by correlation other parts of the organization.[10]

So we are led to believe, then, that because creation, according to a common plan or pattern, is "hopeless," we must then accept other theories and other hypotheses without end to make the theory of common descent work!

As a teacher on the college level I find that some students have preconceived ideas that creation is "hopelessly at variance with modern science." As a lecturer on matters of science, the Bible, and evolution, I often have the privilege of speaking before high school convocations or in small classes in biology, and I find that high school students express the same doubts that Darwin suggested in his book! With but few exceptions, the only argument they have heard is evolution. Might it be because this is the only world viewpoint their young teachers know?

At every opportunity I draw from what I believe to be the best rebuttal to the whole idea of evolution as a "scientific" theory. I refer to the Introduction to the centennial edition of the *Origin,* by Dr. W. R. Thompson, F. R. S.! And I stress the meaning of F. R. S.–Fellow of the Royal Society! Actually, Dr. Thompson was formerly Director of the Commonwealth Institute of Biology at Ottawa, Canada. High school libraries, as a rule, do **not** have this edition of *The Origin* and most librarians have never even heard of it!

The force of the arguments put forward by Thompson is the greater because of their position in the Introduction to the very "Bible" of evolutionists; and of course, as he admits, it is not a "hymn to Darwin and Darwinism that introduces so many textbooks on biology." He has this to say in regard to the matter of "slight modifications" to explain homology:

> What such cases of . . . general homology actually demonstrate is that there are large numbers of organisms, differing considerably in the details of structure but constructed on the same fundamental plan. However, this is no proof of descent from one original ancestor of this anatomical type. *This itself requires proof.*[11] (Emphasis added)

Furthermore, Thompson rejects the oft-repeated quibble of evolutionists, that such similarity is more difficult to account for on the independent origin of complex types; and, he suggests that until the mechanism is accurately known by which "the selection of successive slight modifications" could account for this similarity, we must admit that our information on this matter is inadequate. Also it must be asserted that evolutionists, for the most part, have made the mistake of considering only similarities, while ignoring almost completely, the differences between organisms.[12]

Darwin's Reasoning Noted

I should like to call attention to the manner in which Darwin attempts to account for *successive slight modifications,* and call attention to a most amazing piece of writing which serves as the best rebuttal to such changes as I have seen in

print. Darwinian reasoning on this line goes like this:

> In changes of this nature, there will be little or no tendency to alter the original pattern, or to transpose the parts. The bones of a limb might be shortened and flattened to any extent, becoming at the same time enveloped in a thick membrane, so as to serve as a fin; or a webbed hand might have all its bones, or certain bones, lengthened to any extent, with the membrane connecting them increased, so as to serve as a wing; yet all these modifications would not tend to alter the framework of the bones or the relative connexion of the parts.[13]

And with the best catch phrase of them all, "if we suppose," so often resorted to by evolutionary propagandists, we are introduced to this superb explanation for the "why" of homology:

> If we suppose that an early progenitor–the archetype as it may be called—of all mammals, birds, and reptiles, had its limbs constructed on the existing general pattern, for whatever purpose they served, we can at once perceive the plain signification of the homologous construction of the limbs throughout the class.[14]

It is absurdly easy to exaggerate the similarities while at the same time overlooking the differences, and it is a mistake most difficult to avoid. There is a delightful commentary on the matter of the supposed homology of the vertebrate limb; it was written shortly after the appearance of the *Vestiges.* It is given by Clark, and is often called "homologizing the table"!

> The reviewer imagines an ingenious young man, Martinus Scriblerus, who is determined at all costs to discern connexions between things quite irrespective of whether those connexions are real or imaginary. . . . What should have prevented him from casting a philosophic glance upon the furniture in his room? With less ingenuity than certain physiologists, he would easily detect a marvelous unity of plan. . . . He would probably have taken the table with its four legs and the disk they support, as his great type of joinery, and would have traced a modification of this type in all the articles around him. The chair is manifestly nothing else than the table with a development of the hinder legs called the back. From the chair to the sofa the transition would be ridiculously easy; indeed, the sofa can only be considered as a variety of the chair, produced by a high state of cultivation. In the footstool or ottoman, the disk of the table has become thick and pulpy while its legs have dwindled into small globular supports. . . . What is the four-posted bedstead, but a reduplication of the original type, a table placed on a table, the upper one being laid open? . . . the coal skuttle, might, perhaps, present some difficulties. . . .[15]

The ludicrous nature of such reasoning can be easily detected. Such speculation, and such similar reasoning by evolutionists has brought forth many fantastic homologies, none of which can be substantiated by experimental proof of any kind. The simple truth is, of course, that one joiner or cabinet maker could have made each piece of furniture and all of them if he chose, just as the notion struck him, utilizing for each piece such purposefulness as he deemed necessary to make the piece work.

It has often been objected that creation scientists cannot argue, that because man makes things in certain ways, that therefore, God, as Creator, has made things like we do. Also, as one widely publicized high school text asserts, in referring to advances in locomotion of animals, "One should not suppose any of these advantages . . . were purposefully acquired."[16] I submit that although God's methods of creation are largely inscrutable to us now, that there surely is design in the organic world. That there is certainly purpose would seem to be the obvious explanation, that indeed, eyes were made for seeing, and ears were made for hearing![17]

In this connection, on the matter of making things, I came across this statement purporting to come from a biologist of a former generation, George Mivart. He is quoted as saying:

> Mivart asks us to contemplate what we would do, as it were, if we were God and were going to create man. He says we would be guided by these considerations: (I) to live on this earth man must resemble animals in that he must eat, breathe, etc.; (II) as being an intelligent creature he must have a large nervous system; (III) as such, no invertebrate nor reptile nor fish nor bird is so built as to be able to support such a huge nervous system; (IV) whales, porpoises and seals are ruled out . . . and for the same reason we must rule out (V) the hoofed mammals; (VI) this restricts us to the carnivores, and among them those who have a body most closely suited to what a man should possess are the simians.[18]

Thus man has many traits in common with other animals, seeing that he is to breathe the same air, eat certain of the same foods, etc., and this should come as no surprise. But the Bible says, in its own way, much the same thing, and yet condemns the scientific humanist in his attempt to hold man up as being "just" an animal! In Ecclesiastes we find these words:

> I said in mine heart concerning the estate of the sons of men, that God might manifest them, and that they might see that they themselves are beasts.

> For that which befalleth the sons of men befalleth beasts; even one thing befalleth them: as the one dieth, so dieth the other; yea, they have all one breath; so that a man hath no preeminence above a beast; for all is vanity.
>
> All go unto one place; all are of the dust, and all turn to dust again.
>
> Who knoweth the spirit of man that goeth upward, and the spirit of the beast that goeth downward to the earth?[19]

Attention Given Serial Homologies

The matter of serial homologies is mentioned often, and some examples are given by Darwin. But we shall let one of his contemporaries, Thomas Henry Huxley, grandfather of the celebrated modern evolutionist, Sir Julian Huxley, expound upon this matter. It was Huxley who popularized Darwin's ideas; he was certainly an arch-enemy of Christianity. He wrote:

> I have before me a lobster. When I examine it, what appears to be the most striking character it presents? Why I observe that this part which we call the tail of the lobster is made up of six distinct hard rings and a seventh terminal piece. If I separate one of the middle rings, say the third, I find it carries upon its under surface a pair of limbs or appendages, each of which consists of a stalk and two terminal pieces. . . .
>
> If I now take the fourth ring I find it has the same structure, and so have the fifth and the second; so that, in each of these divisions of the tail, I find parts which correspond with one another, a ring and two appendages; and in each appendage, a stalk and two end pieces. These corresponding parts are called, in the technical language of anatomy "homologous parts." The ring of the third division is the "homologue" of the ring of the fifth, the appendage of the former is the homologue of the appendage of the latter. . . .
>
> . . . but whither does all this tend? To the very remarkable conclusion that a unity of plan, of the same kind as that discoverable in the tail or abdomen, pervades the whole organism of its skeleton. . . .
>
> I can point out to you exactly, what modification the general plan has undergone in that particular segment; what part has remained movable, and what has become fixed to another, what has been excessively developed and metamorphosed and what has been suppressed.
>
> . . . But I imagine I hear the question, how is all this to be tested? . . . Does Nature acknowledge, in any deeper way, this unity of plan we seem to trace?[20]

This is the general concept of serial homology, one which is still widely expressed in the literature today. Note that Huxley says he can point out "exactly just how all this modification has come about." He calls upon embryological development to finally solicit more "evidence" for his views, which itself requires proof.

I am reminded of my work as a doctoral candidate at the University of Minnesota. As a graduate student I had to learn a great amount of data on homology, and as an assistant in the department I had to teach it. I refer to the teaching as given in a certain standard laboratory manual. Under the title "Appendages" I find:

> The appendages of the lobster (or crayfish) comprise excellent material for the study of the PRINCIPAL OF SERIAL HOMOLOGY– the modification in structure of a series of originally similar organs serving different purposes. Beginning with the second antennae these are all variations of a common biramous type (illustrated by the third abdominal appendage) consisting of a basal segment, the *protopodite,* and two branches, an outer *exopodite,* and an inner *endopodite.*[21]

Here we see, then, the principle of serial homology expressed much in the same manner as Darwin and later Huxley spoke of it. The laboratory manual is widely used and accepted in many college courses in zoology and biology, While I have no quarrel with zoologists who propose to name the parts of the biramous appendage of the lobster, I object to the certain and dogmatic attitude authors express about the manner such modifications may have come about. Like Huxley, they point out "exactly" just which modifications have been made, and in what manner. This is, of course, pure supposition, and it should be recognized as such. While the laboratory manual does not specifically state that serial homology is due to evolution, students readily make such an implication.

Space will not permit an extended review of works since Darwin and Huxley which served as a rebuttal to the rising acceptance of evolution as the only explanation for homology, but it can perhaps be safely said that they appealed to the argument from design.[22,23,24] Suffice it to say, some of the dangers they foresaw concerning the acceptance of evolution by high school students are essentially similar to those we speak of today, in fact, this is the chief reason for the writing of this paper.

The difficulty lies in the fact that there is very little reading done on the creationist viewpoint, and high school students are generally poorly prepared even in the evidences for evolution. This brings me, then, to consideration of some

popular and widely accepted high school texts, and what is said in them about homology.

Consideration of High School Texts

A text now widely in use in high schools throughout the land is *Modern Biology*. Since my return from the mission fields of Switzerland and Germany in 1953, I have watched with interest various changes that have taken place in succeeding editions of this popular text. I am certain that few parents, and perhaps fewer teachers are aware of specific changes effected since the deaths of the senior author, Paul B. Mann, and one co-author, Truman J. Moon. James H. Otto is the only member of the original team of writers still remaining.

The 1956 edition, the last in which Mann was writing, carried a statement concerning the fact that there was "nothing in all of science that in any way opposes a belief in God and religion."[25] This has been **omitted completely** from the two succeeding editions., *viz,* 1963 and 1965. I cannot say for certain, of course, but I imagine that Dr. Mann was a religious person and that, at his passing, it was easy to dispense with the statement about God and religion for this is offensive to many educators; any mention of such is generally omitted from modern texts in biology.

Another reason may very well be that, as science is now taught, there is much that does oppose belief in God and religion! If this is not true, then why do so many young people in high school and junior high school raise so many objections to the Bible and against God when I speak to them about the creationist point of view? I believe that the God-opposed doctrine—evolution—is in our schools and the Bible is out, and I am not the only scientist of this opinion!

Modern Biology, 1956 edition, contained one chapter on the "Changing World of Life," in which some seven "evidences" were offered as proof for evolution; all this was included toward the close of the book, so that the teacher could omit the section if he chose, The "evidences" listed were: 1) fossils, 2) homologous structures, 3) vestigial structures, 4) embryology, 5) geographical distribution, 6) results of breeding, and 7) experimental genetics. Fossil man was not mentioned nor shown in this edition!

In the 1963 edition a chapter was added on "Structure of the Human Body," and in this chapter "fossil men" were included, with fanciful reconstructions![26] The 1965 edition was further increased in size, as was the presentation of evolution. The chapter title, "Changing World of Life," became "Organic Variation" and there is an **entire** chapter on the "History of Man." Let it not be said that editions of *Modern* Biology do not teach evolution!

In all fairness, it must be admitted that the authors still include some qualified statements for Darwin's theory of evolution, stating: "In its broader features it is accepted generally, although it fails to account for all the known facts."

Treatment of Homology

Homology is discussed in about the same way in all three editions, and the same identical figure accompanies all three, though the caption has been changed. (Figure 1). The following is given on homology:

> In both plants and animals we find parts that are evidently of similar origin and structure, although they may be adapted for different functions in different species. These parts are called homologous structures . . . the bones of the bird's wing, the front leg of a horse, and the paddle of the whale are so similar in structure, that with slight exceptions, they are given the same names.[27]

Again let me repeat that similarities in plants and animals do not necessarily indicate descent from a common ancestor; it could just as easily be due to a common plan or a common design. What is called adaptation by evolutionists is maintained by creationists as evidence of design with as much science on one side as the other. The **facts** of the similarities are the same for each proponent; it is the **interpretation** which is *different,* and this, of course, must remain subjective.

Giving an answer to the similarity in names of the bones, it must be admitted that this is what would be expected if one mind designed the various animals. Also let us admit that no anatomist would mistake for a moment the radius or ulna of a bird, when compared with that of a dog or of another animal. There are considerable differences, but the same plan.

Modern Biology editions are highly respected throughout the country and avidly used by many biology teachers. This text, among those widely used, is perhaps the least objectionable in regard to "propaganda" for the doctrine of evolution. Yet, no teacher or student should believe for a moment that the text does not teach evolution, Actually, the doctrine of evolution is all there in the text for the young person to read and to study; and, with the addition of the data on anthropologic "evidence" of man's ancestry, it is perhaps as complete as any.

In the hands of a skillful teacher, who is himself persuaded to accept the evolution story as given, it can be a very convincing demonstration, In the hands of a teacher willing to present both sides of the controversy—evolution vs. creation—it can serve to show why the authors generally are cautious in not claiming too much for any of the "evidences."

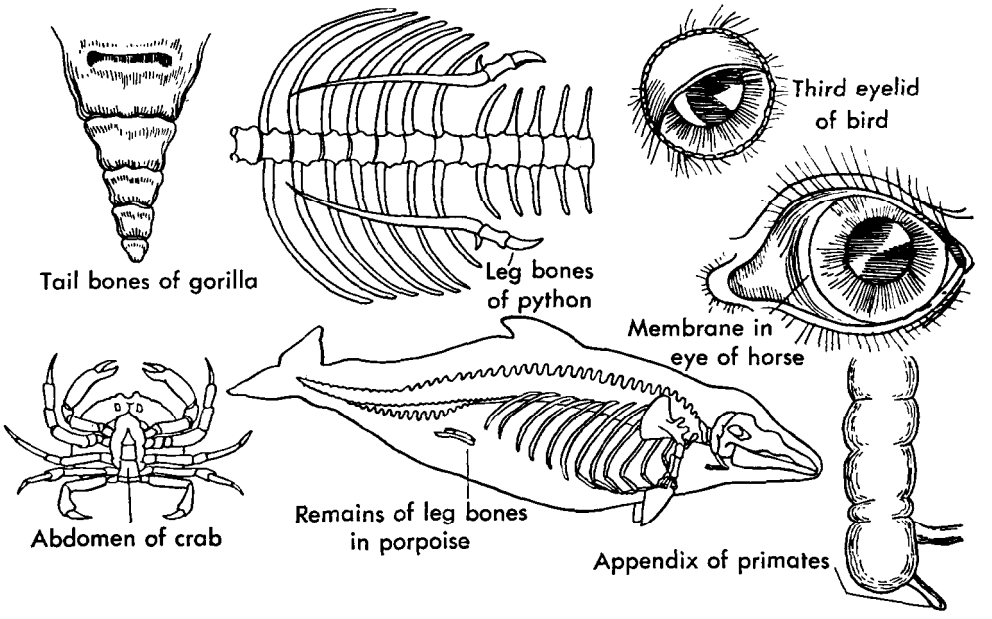

Figure 1. "Nonfunctional vestigial organs are common among animals, and provide one source of evidence that life has changed through the ages," from *Modern Biology*. Moon, Otto and Towle. 1963. Holt, Rinehart and Winston, New York. p. 14. Used by permission of publisher.

Perhaps we need, then, to begin with our grade school and high school teachers, because what they believe and accept as background in science is very likely what they in turn will teach others. I teach elementary education majors, as well as general biology students who may go into teaching later, and it has been my experience that young college people, who plan to become teachers, are generally poorly prepared to meet this issue.

Many are not even aware that there will be a conflict in their classrooms, between what the State requires them to use as a text and, if they are of creationist persuasion, what they privately believe. If they are already evolutionist in persuasion and outlook, it is because they have heard just enough to convince them of some of its broad generalizations, but not enough detail to show the deceptive nature of its arguments, as in homology. The facts are there for all to see, but the meaning of those facts is a matter of one's own subjective appraisal.

As I have written elsewhere,[28] biology teachers at David Lipscomb College evaluate the claims of evolution before every class of students under our supervision. I emphasize that before one can meet false doctrine he must first know it!

I come now to consideration of other widely adopted high school biology textbooks; namely, the three BSCS (Biological Sciences Curriculum Study) biology textbooks, initiated in the interest of better teaching in biology by the American Institute of Biological Sciences, and produced under the immediate supervision of the Director, Arnold B. Grobman, of the University of Colorado at Boulder, Colorado.

I refer, of course, to the Green, Yellow and Blue versions of the BSCS series, each of which is published by a different publishing house. I will quote from each with regard to the manner of presentation of the general theme of evolution, and of homology in particular.

(While lecturing this past summer in the Denver area, I was privileged to speak to two of the writers of the Green version, both of them high school teachers. One writer volunteered that he was very disappointed and much displeased with some of the bold assumptions made in the book; the other admitted that "perhaps some statements were a little far-fetched.")

Green Version of BSCS Series

The Green version is perhaps the least objectionable of the three in advocating evolution as a fact, since an ecological approach is utilized. But as I pointed out to one of the writers on that version, it is hardly consistent with complete objectivity in science to "sneak in" evolution doctrine early in the very first chapter (actually on page 19, where webs of life are considered and where dinosaurs are utilized to show various types of consumers! I especially object to the mixture of poorly qualified and completely authoritarian statements, such as:

> Figure 1-12 gives an impression of what might have been going on about 180 million

> years ago, when dinosaurs were the biggest things around. Most of the actors in this scene have disappeared; others have evolved and taken over their parts. But the *processes* have been continuous.[29]

It is true that the caption to the figure (1-12) laments the fact that "the relationships shown in this figure are not as certain" as those of a preceding figure utilizing present-day organisms. But I decry the method here used of assuming evolution as already proven, and calling upon youngsters to accept statements like "others have evolved" without the slightest shred of evidence having been offered for the theory beforehand.

In fact, the only evidence stressed in the book is that of the fossil remains, discussed at great length in the chapter on "Patterns of Life in the Past." Oparin's theory on the origin of life is sandwiched into this chapter under the heading "The Earliest Life–The Pre-Cambian." The idea of "consumers" as the first living things is adopted though this is considered "odd," since producers are thought to be the primary basis of all living processes! The authors write that Oparin's theory simplifies things; it is easier to imagine how life began than it is to imagine how photosynthesis began! How true this really is; yet, the heterotroph hypothesis is here avidly endorsed!

I can find no direct reference to homology as "evidence" for evolution in this text, but in the chapter on the "Human Animal" a reference is made to the fact that man can stand, walk and run upright on his hind legs. This condition, the authors say, leaves his hands free to manipulate and carry things—and this involves many anatomical modifications, but what these modifications are, or how they are brought about, is not given.

Some distinctive differences are given between the human animal and his closest contemporaries, the apes. One difference is that the head is fixed to the spinal column in such a way that man can look straight ahead when standing upright. The so-called fossil evidence of man is pictured and discussed in the same chapter under the heading "Becoming Human."

I challenge anyone to believe that a youngster, of the age when this is generally presented, would not quickly see that here there is a direct conflict between what the preacher says on Sunday from the pulpit, and what the teacher teaches through the week in his biology class. Thus doubt becomes his overwhelming and miserable companion.

Little wonder, then, that the Bible account of man's origin is discredited and the gospel is nullified because this is supposed to be "science"! If any pupil dares to raise any question concerning this conflict, he is offered the alternative of "theistic evolution," as so many young biology teachers say when questioned. This is the way "God did it," they offer.

Plea for More Parental Attention

How many parents actually know that such things as this are found in their son's or daughter's high school text in biology, and how many could give any kind of answer to their doubting student's questions? Indeed, how many preachers could? I know of some who are well prepared to "give answer to everyone that asketh a reason for the hope," even if it is in science.

And yet, the whole matter could be solved, if the student had a copy of *In the Beginning,* that very fine little book by Rita Rhodes Ward.[30] Everywhere I go I urge parents and church leaders to "put one of these into the hands of every young person," but to some it seems that the saving of a young person's faith at the time of his doubt is not worth a mere $1.25! And this is the tragedy of the whole matter, it is not just science at stake; it is faith!

A copy of Thompson's Introduction to *The Origin,* cited before, might also help to hold a boy or girl on a firm footing! I have yet to find either one of these on the shelves of a high school library, or of any church library! Yet there are literally scores of books on the evolution worldview, including the Life Nature Library series, all in beautiful color. Could we do more to see that books on the Creation viewpoint are placed in reach of high school young people?

A young school teacher in Danville, Illinois (graduate of the University of Illinois with an M.A. degree and of some years teaching experience in science) makes the same plea to parents and educators alike:

> This book was not written to discuss the history of the theory of evolution or the number of men who have promoted it down through the years. . . . Lengthy books have been written by scholars on the subject. Unfortunately, most of them are in favor of it! Nearly every biology or general science book contains some thoughts on the subject, so the average pupil of today is exposed to this theory from the time he or she *enters the sixth grade in elementary school.* (Emphasis added. Evolution is even now being pushed rapidly downward into even lower grades, and in some places into the second grade–Author.)

My main criticism of this is that pupils do not get an opportunity to read materials presenting the Bible story of Creation. The pupil who would protest the textbook presentation of evolution is without any information with

which to combat the views presented by his text or teacher. Many are overwhelmed by the so-called "evidence" supporting evolution. *The result is often tragic.* The child's faith in the Bible is shaken and he is left floundering without knowing where to get help. (Emphasis added)

The encyclopedias fall down at this point, as do most other reference books. (Author's Note: The reason for this is that the authors themselves are evolutionist-persuaded and are not usually objective enough to point out any other view. However, the *World Book Encyclopedia*– 1967 printing, Vol. 6, pp 330-334, widely used by pupils, does have a very fine treatment of the matter, written by an evolutionist, Carrel Lane Fenton.) I do not know any reference work, normally used in the classroom, which even mentions the Bible story of Creation. Sadly enough, many ministers are unable to answer the challenges of the texts and cannot counsel the needy one.[31]

While I believe that this is certainly the situation, surely the young people themselves are to blame in part. I find few who really know much about the "evidence," most of my lecture time is often taken up in telling what they should already know.

Yellow Version of BSCS Series

The Yellow Version of the BSCS series presents quite a different approach—from the standpoint of ten basic themes in biology, the first of which is "Change of living things through time: evolution." These basic themes have been thoroughly and adequately reviewed in a previous article in the *Creation Research Society Quarterly* by Mrs. Rita Ward,[32] but an examination of the first will bear repeating.

Evolution in this text is introduced in this fashion: A heading states, "Like Produces Like," but the fossil evidence is then invoked to show that over the course of time, descendants of the first organisms "have changed to become the animals and plants of today. This is evolution, once hotly debated but now a well established theory."[33]

The authority of the experts is given in the statement: "The tremendous variety of kinds of animals and plants living on earth today is a consequence of evolution—each kind becoming modified for living in its own way."[34] I believe that it is just as "scientific" to claim that each organism is designed to live in its own way, and the adjustments and accommodations for life are so well illustrated by such creatures as the Duck-billed Platypus and many others.

I was attracted to a statement on page 9 of the Yellow Version in which the authors state that one of the human goals in biology, among others, is "to understand the origins of life and to rid oneself of superstitions and fears. " Yet, after a thorough treatment of the controversy over spontaneous generation is given in Chapter 2, then these amazing statements are offered, may I point out, to bolster the **superstition** of spontaneous generation:

All competent biologists are biogenesists. They accept the view that on the earth today life comes only from life. . . . We know that the world was once without life–that life appeared later. How? *We think it was by spontaneous generation!* (Page 42.) (Emphasis added)

The entire Chapter 36 is devoted to an exposition of the heterotroph hypothesis and of Oparin's theory. A "sub-glob" of protoplasm is invoked as being one of the steps in this type of "speculative thinking" and there are several references to a "hot, thin soup." Yet all of these arguments have been adequately answered elsewhere, and often in previous publications of this Society.

As for homology, the Yellow version offers this as a "proof" of evolution, in these words:

During the course of evolution, the structures of the various descendants of the common ancestor became increasingly different. In many cases, however, some evidence of similarity still remains. Thus the wing of a bat, the arm of a man, and the flipper of the whale all have the same basis of structure in spite of their superficial dissimilarity. . . . This type of relationship is called homology. . . .[35]

As "proof" of this assumption that similarity can only be the result of evolution, the idea of "vestigial organs" is invoked. The list of organs includes the appendix of man, which the authors dogmatically state "has no important function," and further that it has been "removed from thousands of persons without ill effects." (p. 607)

I ask, because one of the lungs can be removed without ill effects from a person with lung cancer, does this indeed make the organ therefore "useless"? Vestigial organs are listed for other animals, such as the "vestiges of hind limbs in whales, the ancestral hind legs of the python, and the vestigial wings of the flightless kiwi." I think Thompson has given the answer, quoted previously in this paper to all these arguments. Also, Dewar insisted upon the fact that the lack of "nascent" organs, on the way toward becoming useful, represents a formidable obstacle to this type of reasoning!

Authors of this version close the section on homology with this question on p. 607, "Whence comes this wonderful unity and similarity that is evident . . .?" They admit, "It need not, of

course, come about because all of them have descended from a common ancestor. . . . But since "in our experiments all organisms *do* inherit their characteristics from their ancestors, evolution is one way of explaining unity or basic plan combined with diversity in detail." The appeal to modern genetics, to bolster what the assumptions in homology seem to show, must fail, for it is still true that like begets like. No other views are mentioned!

Blue Version of BSCS Series

The latest edition of the Blue Version, of the BSCS series, *Molecules to Man*, leaves no doubt as to an all-pervading use of evolution through these glowing words:

> Of all the theories you may study in biology, the theory of evolution occupies a unique place. It is the most inclusive of the great unifying principles of biology. It is so much a part of the foundation of biology that the science can hardly be understood without it. . . . Throughout this book it will be evident that the theory of evolution by natural selection is the major framework of modern biology.[36]

In the "Teacher's Edition Notes," there is this statement, which seems to be somewhat more qualified than the previous edition (1963) in regard to acceptance of evolution as fact. I think we need to have this before us so that we may see for ourselves just what they do say. Here it is:

> Although the idea of evolution is a relatively new idea for many high school students, some will come to the subject with preconceptions, many of which will act as a barrier to the proper understanding of evolution. The authors feel that evolution should be defined simply as "descent with modification," since the basic assumption in evolutionary theory is that organisms living today are modified forms of their ancestors. Once the student grasps this fundamental assumption, many of his preconceived reservations about evolution will disappear. *He will understand that evolution is not a fact, but a scientific theory proposed to account for certain observations.*[37]

And yet the true approach of the authors to evolution as a unifying principle is again mentioned in the teacher's notes. The authors regret that no encyclopedic listing of the "evidences"' for evolution is given. The fossil record, they say, is only one of "types of supporting evidence," among which homology is described.

In my estimation the absurd claims of the first edition of the blue version have been somewhat "toned down," in this latest edition, yet the concept of homology is given in very definite fashion. It has changed little since the time of Darwin's exposition of the same, and this was the reason why I began with Darwin, though it is now only of historical importance.

In the chapter on the skeletal and muscular systems we find a rather extensive statement concerning homology. This entire matter of similarity was not found in the previous edition. One illustration in the new edition shows essential similarities and differences between the walking, swimming, digging and handling fore-limb of typical vertebrate types. The authors write:

> The bones of the forelimbs of various vertebrates are compared in Figure 24-5. At first glance, you might think that the left forelimbs of the salamander, crocodile, bird, bat, whale, mole, and man are very different . . . these limbs are used for different activities: walking, flying, swimming, digging, and handling. Yet if you look closely, you will see that the bones of these limbs are remarkably similar. . . . *It is thought that* such similarities exist because these vertebrates share a common ancestry. (Emphasis added)
>
> . . . *It is assumed that those organisms* with more similar structures are more closely related than those with less similar structures.[38] (Emphasis added)

In the "notes to the student," artfully and quite cleverly added to the pages of the book (I really commend this method!), there is a reference to the fact that these are examples of homology, but the words homologous and analagous which give so much trouble to evolutionists, are not used at all in this section. I have not been able to find the subject of vestigial organs mentioned anywhere in this text; it is not mentioned at least in the index.

A Final Comparison

Before I close this paper I want to show similarity in teaching on the matter of homology in another language. I quote just a little from a textbook as widely adopted in the German-speaking countries of Europe as are some of our texts in, this country. I refer to Lindner's *Biologie*, a book used in the Gymnasium (pronounced Gimnawz-ee-um) or "Hochschule," slightly more advanced than our junior college level and leading to the university, I found the book in use at the University of Zurich in Switzerland, and I call attention to this short passage:

> Organe, die bei verschiedenen Abteilungen einer Tier oder Pflanzengruppe denselben Bauplan aufweisen und dieselbe Stellung im Verhaltnis sum Ganzen haben, heissen *homologe Organe* . . . ihr geneinsamer Grundplan kann nur so erklart werden, class sie sich

(Continued on Page 66)

The beauty of form and color in plants does not give wild plants a selfish advantage, and thus form and color are not explained by the theory of evolution.

The theory is based also upon the assumption of *gradual* change; but the intermediate forms, of which there would have to be many in the dragonfly, would not be functional and so would be an obstruction in natural selection. This difficulty has been pointed out many times with respect to various creatures.

Creation and evolution present contrasting views of nature and of God, its Author. Jesus said that God is personal; enough like a man that those who had seen Him had a conception of God. (John 14:8 and 9) If this be true, we can believe that God purposely created a world of variety and beauty. On the other hand there is a group of persons who prefer to represent God by a group of laws–cold, grinding laws.

Take your choice of these two world views. But don't look for solid ground half-way between them. There is none.

(Continued from Page 64)

durch Abstammung von einer einheitlichen Grundform herleiten.[39]

(Translation: "Organs which demonstrate the same basic pattern and the same position in regard to the whole in different animal or plant groups are called homologous organs . . . their common basic plan can only be explained in that they point back to descent from a common ancestor.")

The typical plea for support for evolution from basic plan is made here again, the phrase "can only be explained . . . by descent from a common ancestor" somehow reminds one of Dobzhansky's petulant remark: "They do not make sense, otherwise!"

To be sure, our forthcoming *Creation Research Society* text, *Biology, A Search for Order in Complexity,* has done biology a great service, in exposing these false claims for homology as "proof" of evolution, and showing that similarities could be due as easily to one great Mind. Determination, as to whether organisms are closely related or not so closely related, upon the basis of homologous organs are found to be based upon *subjective* considerations, and not upon *experimental* means alone.

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