CREATIONISTIC BOTANY TODAY: A PROGRESS REPORT

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The field of creationistic botany is like a stately forest that long ago experienced fire and now has begun to sprout again. The fire in this analogy is a destructive blaze that was ignited by Charles Darwin and others over 100 years ago. In the wake of this ideological holocaust, only a few lonely voices were heard to speak a message different than the monotonous crackling of "natural selection" and "survival of the fittest." These creationistic botanists stood something like thick-bark trees that escaped the raging of the flames. Now the fire has flickered and the air has begun to clear so that a regrowth of a new and better concept is seen upon the scientific horizon.

This article is presented as a survey of the creationistic revival in scientific botany. It is like a field trip into the present landscape of theoretical science. It is intended to show at once the vigor of various research avenues, and to designate the areas that yet need to be replanted if a balanced forest of creationistic concepts is to flourish. If this essay encourages only one new person to embark upon a creationistic study of plants (to sow new seeds where soil has long lain fallow) it will have been written to some avail.

History of Botanical Creationism

It would be a worthy and lengthy topic in itself to call the roll of those who have championed creation science from 1859 to this present time. It will be enough here, however, to see some general trends and pay honor to a few key individuals.

Before evolution theory achieved popularity, the history of creationistic botany was the same as the history of plant science itself. Yet most books that present the history of theoretical biology speak largely or only of the history of evolution.

Like a cool drink in a barren waste, Frank Marsh's book, *Studies in Creationism* has bountifully supplied information on this neglected phase of science history.[1] Marsh made a major stride in providing detail of early creationist thought of churchmen and later of such giants as John Ray and Linnaeus.

It is to the discernment of John Ray that we owe the concept of the Dicotyledonae and the Monocotyledonae groups within the category of flowering plants. Ray correlated whole clusters of characteristics that were present in plants he designated as monocots–parallel veins in the leaves, one seed leaf or "cotyledon," flower parts generally in threes or multiples of three, and vascular bundles scattered throughout the stem.

He noted conversely that dicots have netted veins, two cotyledons in the seed, flower parts generally in fours or fives, and vein bundles neatly arranged in a ring near the periphery of the stem. These coherent groups are still upheld by taxonomists of our day.

Great botanist and diligent student of the Bible, Ray wrote a book which some believe to be the main force that prevented the scientific world from slipping into the abyss of evolution for over 200 years– *The Wisdom of God Manifested in the Works* of *Creation*.[2] Of this book, John Green wrote, "Profoundly non-evolutionary in character, it was to constitute the chief obstacle to the rise of evolutionary views."

Following Ray and surpassing him in scientific genius was the Swedish botanist, Carolus von Linnaeus. This eminent scientist correctly judged that plants were formed by the Creator according to their species—more or less as we see them today. As an older gentleman of science Linnaeus envisioned minor changes in the groups of plants, but he always recognized the factual limits of variation. By attending to details and resisting imaginative fantasies, he laid the foundation for all botanical taxonomy that has followed.

Louis Pasteur was an open opponent of spontaneous generation in the origin of bacteria and his classic experiments heaped mountains of evidence against the theory. The fact that Louis Pasteur was a creationist is quite true, but not widely acknowledged in our day. A brief study of his biography indicates that he had deep faith in God as the Creator of life—particularly life in the world of little "germs" he delighted to study in his profoundly fruitful research.[3]

After publication of *The Origin of Species*, the thread of botanical creationism was almost obscured from vision as leading scientists scurried to apply this dogma to every realm of natural science. Few people have attended with objectivity to the records of creationistic thought between 1859 and 1920, and literature on creationism after Darwin usually centers on two specific boundary periods.

At one end of this span, around 1860, much is known of the immediate refutations to Darwinianism presented by the able geologist, Sedgwick, and others. We are indebted to Robert E. D. Clark for a penetrating analysis of the crossfire in those early days.[4] Frank Marsh tells

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us of the timely challenge valiantly spoken by Louis Agassiz in the face of the Darwinian onslaught—a weird variety of creationism in which many catastrophes and recreations were postulated.

Creationist Opinion Revived

At the other end of the time period, beyond the year 1920, one can find considerable data surrounding the recent revival of creationist opinion. The record of this re-growth must center on at least four scientific societies that have germinated.

First, the Evolution Protest Movement began to function formally in the year 1932 and has produced since then an unending series of pamphlets and books which report the work and ideas of creation scientists.[5]

Second, a Canadian counterpart of this group, known as the International Christian Crusade, although the society is not limited to matters of science, has prepared a priceless little handbook packed with anti-evolution arguments quoted from leading scientists. This small compendium is of such high merit and such low cost that it should be distributed widely.[6]

Third, the Creation Research Society appeared in 1962 as 10 men of science decided that an organization particularly dedicated to the publication of the creationistic data was long overdue in America. A survey of its brief history has been written.[7] Although articles deal with many areas of natural science, all published material of the Creation Research Society supports Genesis in some way as an inerrant, scientific record. Among other things, each member of the society is committed to the propositions that:

> All basic types of living things, including man, were made by direct creative acts of God during the Creation Week described in Genesis. . . . The great Flood described in Genesis, commonly referred to as the Noachian Flood, was an historic event worldwide in its extent and effect.

Although it has other fascinating projects, the Creation Research Society specializes in producing one *Annual* and three scientific *Quarterlies* each year for professional scientists and interested laymen.[8]

Fourth, the Bible-Science Association originated in 1963 as an attempt to provide laymen with a scientific basis for Bible creationism.[9] This group publishes a valuable newsletter which features articles that relate to special creationism in particular or to Bible inerrancy in general.[9] The Bible-Science Association has been a promotional organization also, specializing in creation seminars and creation radio broadcasts over many stations across America.

Still other societies of this type exist in America or in the world at large because creationist thought has come again into broad daylight. Some of these societies are omitted here simply because the present author is not directly informed. Other Christian scientific groups are presently disregarded because they are in no way committed as organizations to miraculous creationism as opposed to theistic evolutionism, and their publications must therefore be selected on the merit of individual papers. But the point we presently ponder is that at least four creationistic societies have emerged within the last 40 years, two of these within the last 10 years.

Specific information exists about the post-Darwinian decade and also about very recent trends of creationism, but only meager word is found about the time between. John Moore, however, has examined the literature of science and found many authors during the center decades of this 100 year span, who have either questioned evolutionary theory or come out strongly in favor of special creationism.[10]

George Price in his revision of theoretical geology to conform with Noah's flood has done worthy spadework on a creation viewpoint of fossil plants. Great names like Agassiz, Price, Bryan, O'Toole, Dewar, Rimmer, and others come as echos in the corridors of creationist time, but a more extensive study of the historical thread is needed.

Creationistic Plant Physiology

Plant physiology is that branch of the botanical tree which attends to the life processes. Physiologists analyze such phenomena as the movement of materials throughout the plant, or the way the plant makes its food from carbon dioxide and water in the light (photosynthesis.)

Many people who study plant physiology believe the evolution theory, but seldom mention it as a working part of their research projects. I believe this silence stems from the fact that physiologists are primarily bent on solving immediate, practical problems of plant function.

I also maintain that the evolution theory is of little real value in their work for evolutionism has made little if any vital contribution in the work-a-day world of biology. A seed germinates, grows, and develops into an adult plant despite whatever evolution theory proposes about its ancestry in ages past.

It is for this reason that evolution has had its greatest popularity among theoretical botanists while it is seldom mentioned in the experimental work of bioengineers, biochemists, physiologists, or medical doctors. Some of these same workers appear to weave the theory into their discussion now and then, apparently out of some deep sense

of loyalty or obligation, but the involvement usually amounts to a non-essential postscript.

The Bible and Plant Physiology

By the same token, however, one may ask what role creationism may play in plant physiological study? We may investigate the statements of the Bible itself and see if they square with modern knowledge of plant life and nutrition. Such comparisons invariably show absolute Bible inerrancy on the subject of plant physiology.

Consider the process of photosynthesis in which carbon dioxide gas and water from the soil combine within the plant under the influence of sunlight energy to form sugar–the basis of all plant and therefore animal nutrition. Ancient writers who lived even after Bible times held false notions about plant food. For example Vergil believed that plants take their food directly from the soil.[11]

The Bible does not mention photosynthesis as such, but its statements about plant food are amazingly correct. The Bible indicates that sunlight plays a role in plant food synthesis, ". . . precious fruits brought forth by the sun," (Deuteronomy 33:14). Also water is essential in food synthesis according to Isaiah 44:14b, ". . . he planteth an ash and the rain cloth nourish it."

Finally, plants do not actively gather food as animals do. Plants do not even pump their food from the soil, as Vergil imagined. They simply remain in one spot under the sunlight and passively produce their sugar. Notice how exceedingly accurate Christ's words were concerning this aspect of the physiology of a lily, ". . . they toil not, neither do they spin," (Matt. 6:28). Other examples of Bible accuracy in physiological matters exist and creationistic botanists can be active in showing that true science and the Bible record have perfect fit.

The Bible and Research Problems

Creationist botanists may begin to explore some of the apparent problems that plant physiology poses for the Bible account. For example, land plants are known to die readily when submerged for long periods under water. Since no mention is made of provision by Noah for plant specimens on board the ark, how could they have survived through the flood?

One investigation of this sort was aimed at testing the ability of seeds from various plants to germinate after soaking in fresh or ocean water. After soaking for 140 days in either fresh tap water, ocean water, or a mixture of the two, seeds from three out of five species of weeds germinated quite well![12] This would indicate that the flood posed no real problem for survival of some seed plants. Furthermore, as pointed out in the article, seeds may have been preserved on the ark and planted or unknowingly disseminated by Noah after the flood. Further analyses are needed to see what means of survival the olive tree might have so that it could sprout after the waters abated from the land.

Physiologists and ecologists who revere the Bible may take time to portray the great cycles of nature as resting on the providence of Almighty God. Is it not "fortunate," for example, that cellular respiration in plants and animals balances out with photosynthesis in plants to maintain percentages of oxygen and carbon dioxide in the air relatively constant? Physiological evidences of God's care should be put into proper perspective.

Plant physiological studies indicate that such plants as the tomato can thrive effectively in air that has as much as 10 times more carbon dioxide than our present atmosphere. Does this indicate that possibly carbon dioxide levels before the flood were somewhat higher than at present?

Donald Patten has dealt with this whole topic in his book[13] and elsewhere by proposing an antediluvian water vapor canopy that existed above the earth before the global flood. He assumes that the atmosphere before the flood contained about six to eight times as much carbon dioxide as our present atmosphere. He believes that burial of much vegetation to form fossil beds during the flood, together with precipitation and dissolving in colder oceans significantly modified the carbon dioxide level of the atmosphere after the flood-profoundly affecting both the density of plant life and the global climate.

These and many other practical questions await those who like Donald Patten use the Bible seriously in the discipline of plant physiology.

Botany and Design

Some scientists today dwell upon the intricate engineering design manifest in plants and yet assume that chance alone has yielded these complex systems. If we turn now to the world of human literature we will find a helpful analogy. No critic would write a glowing account about a splendid novel and fail to mention the novel's author or worse yet, act as if the novel had no author. This would be classed as a gross breach of etiquette bordering on plagiarism. Similarly, scientists who scrutinize living plants should give at least a "credit line" now and then to the One who by His Decree established the orchids, the algae, or the clubmosses which they borrow for their work.

Creationistic botanists see plants as automated food factories patented by the Master Technician. More than 100 years ago the "Bridgewater Treatises" set the style for this kind of endeavor for they were written by members of

the Royal Society of London to give glory to God for His exquisite handiwork in nature.

Detailed structure of living things points definitely to design in creation in such clear manner that some who would desire another explanation are overwhelmed by the evidence. As Bolton Davidheiser reports, Charles Darwin wrote once to a friend that he had just been studying a peacock's feather and it made him sick.[14] Darwin became ill because he knew that the beauty of color and harmony of organization in a peacock's tail feathers leads directly to God and creation and away from Darwin's own feeble theory of development.

In a book that is well written and delightfully illustrated, Harold Clark has reviewed the argument from design in form that both child and adult will appreciate.[15] In trees, deserts, and seeds with wings, Clark shows evidence of detail planned by a Mastermind. He delves into such wonders as pollination of flowers and the balance between the yucca moth and the yucca seeds.

In his creation book, Fred J. Meldau points to leaf arrangements on a stem and to the internal structure of walnut shells as designs which demand a designer.[16] He deals with the miracle of cross pollination and other teleological subjects.

John C. Monsma edited a book in 1966 which had the express purpose of showing that God is the Author of all life and that there are many unsolved riddles of design in nature.[17] Many chapters deal with biology and some are units that entail design of plants, as the following:

(a) In the chapter, "Only God Can Make a Tree," wood chemist Leonard Burkart glories in the structure and function of the cambium growth layer. He wrote, "The more I delve into the fantastic complexity of wood, the more I am led to believe that there is a very wise and thoughtful Creator–God back of it all."

(b) In another chapter Paul Bartels gives credit to God for the detail of seeds and chloroplasts.

(c) Joseph Klingensmith pays tribute to the Lord for forming plants that yield sugars, oils, proteins, and cellulose in what is an apparently effortless production!

(d) Lawrence Walker redeems the domain of forest ecology by giving God the credit for the balance found in a rich forest. He sees science as ". . . but a feeble, blurred, and highly unsteady reflection" of the Creator's wisdom.

(e) William Vanden Born speaks of natural laws which govern plant processes as Gods laws.

Other Authors See Design

In books and papers, Evan Shute[18] has dwelt on the mechanism for movement in the curious sensitive plant. He marvels at the extravagant variation of design found in the flower parts of various orchids and concludes that such features demonstrate the virtuosity of God.

In his chapter, "Nature the First Inventor," Robert E. D. Clark points to the amazing structural design seen in a stem where bundles of high tensil strength alternate with connective tissue that allows compression.[19]

William Tinkle looks with amazement at the intricate petal structure of the delicate Dutchman's Breeches blossom.[20] Evolutionists attempt to state in generalities that flowers descended from leaves on branching stems. Yet this fascinating flower grows on a leafless stem and thereby defies evolution and testifies to the reality of a personal Creator God.

Herman Schaars has authored articles expressing praise to God for the design found in both plants and animals. His article on the golden rod flower is instructive in that it clears the record in favor of this plant as not causing hay fever but providing much pollen and nectar for hungry bees.[21] In this same series entitled, "Nature and Nature's God," Schaars has shown the providence of God as reflected in the productivity of the olive tree.[22]

Among the approaches that creationistic botanists have used, the argument for creation from Design in plants has been well stressed. Yet there is need for more of this writing. There are numerous wonderful adaptations in plants which ought also be labeled as products of God's own hand.

In the past, creationists writing about design have largely used information available to them in papers or botany textbooks already published. Perhaps in the future God will endow some gifted, creationistic botanists to report for the first time on aspects of plant structure or function which are as yet unknown, and to print the praises of God right in their original published reports! If this were so, then other interested botanists who desired to read or use such information would have to listen as creationists reveal new details of structure and also glorify their God in the same research reports.

Paleobotanical Creationism

The best direct research on the beginning of plants would be to wait and watch while they appear. Re-living the creation of trees and shrubs would settle the controversy of their origin. A good instrument for this study would be a "time-machine" of some sort, equipping our experimenter to reverse the clock!

Other than such science fiction devices, our next best form of evidence about the origin of plants is the ancient plant material which has been trapped in the layers of rock and preserved as fossil substance. Before considering such ma-

terial, we may ask what guidelines the Bible provides for reviewing a fossil world.

"Fossils" are not mentioned anywhere in the Scriptures. Such lack of information does not mitigate against the accuracy of the Bible for we know that a true book does not need to be an exhaustive one. There are many things not covered in the Bible—a fact Bible writers knew quite well (John 20:30). Omission of mention of fossils in the Scripture also means that our understanding of fossils will always be part of "science" and thus be subject to human errors of observation or evaluation.

A thorough knowledge of Genesis will equip creationistic botanists to approach their fossil studies with an appreciation for the dynamics of earth history. Secular colleagues sometimes lack this key to visualizing the buildup of the strata. On the basis of a global flood, many fossil beds were probably formed during and shortly after the deluge.

Bible botanists can question the "creeping concept" of uniformitarianism which demands vast ages for evolution and fossilization. They can challenge this human ideology which has controlled geological thought for more than 100 years, and offer a more reasonable alternative in the form of "flood geology." Creationists are free to think for themselves about fossils on the basis of God's Word and the strata alone.

Fossil Gaps

Do fossils show links of plant "evolution"? Fossils of large and small groups are recorded in the earth as if they were not related to each other or to any other living forms. One need look no further than the evolutionary writings to prove the reality of numerous gaps in the world of fossil plants, as Howe has indicated.[23]

D. H. Scott aptly described the origin of flowering plant groups by asserting, "They seem to appear suddenly, in their full strength, like Athene sprung from the brain of Zeus. We know nothing of their evolution."[24] Creationists contend that the reason we know nothing of plant evolution is that plants never evolved!

The discontinuous character of the plants is not limited to the types of flowering plants common in our yards and gardens, but also applies to other plant groups such as ferns, mosses, hornworts, Lycopsids, and Psylopsids—forms seldom mentioned outside the limited studies of a botany course.[23,24,25,26,27]

In extensive studies, Heribert Nilsson has noted that there is no fossil evidence to support the evolution of any plant group.[24,28] In a monumental treatise he asserts that plants did not evolve but "flared up" in a non-evolutionary manner.[28] Review papers covering this same evidence have been written from a creationist theological vantage.[23]

Knowing this, what might capable creationists do in the area of the "gaps"? Detailed research on fossils reported by creationist botanists is needed very much in this field. Such papers should be of obvious technical excellence, and should carry an open endorsement of the creationist model. They would be "required reading" among educated botanists because they would be original contributions.

This would go far toward publicizing the value of the creationist position in paleontology. Such a worker would eventually be in a position to author a complete book asserting the validity of miraculous creation in the origin of plant types. Until such time, the text of Heribert Nilsson mentioned above comes close to doing all of this. Prof. Wilbert Rusch, Sr., is preparing an English translation which will be of inestimable value to English-speaking creationists when completed.

Fossil Production

How were plant fossils formed? Creationists who believe in a global flood suggest that they were buried and rapidly converted to rock in the wake of the great catastrophe.[29,30] Harold Coffin has analyzed the nature of fossil plants in the Joggins Petrified Forest of Nova Scotia with a view toward finding how the fossil beds were fashioned.[31] In these plant deposits he found reason to believe that the material was transported and buried quickly–layer after layer–as might occur in a great flood. Coffin's approach to fossil study is unique and demonstrates a high caliber of original research.

Fossil Organization

Uniformitarians since the day of Lyell have imposed an evolutionary interpretation upon fossils. They have devised vast and separate "epochs" of earth history. For example, so-called Cambrian layers are believed to be quite old and to represent an ancient "Cambrian age."

Strata that are found beneath the Cambrian deposits are called Precambrian and are thought to be much older still. "Old" strata are supposed to lie beneath much younger strata in a layer cake series believed by evolutionists to trace the "history" of the earth.

One problem with this "geological column" in the world of human fossils is well-known[32,33,34] Man is supposed to have "evolved only after most of the layers had solidified. Yet good examples of human footprints pace forth from Mesozoic ("Dinosaur age") layers **and** in the strata of the Cambrian! These footprints are an embarrassment to the evolution theory and its geological sister, the principle of absolute uniformity.

Although plants do not leave footprints, they shed a mass of tell-tale pollen. Localization of

pollen grains within a geologic layer is *prima-facie* evidence that plants existed when the layer was deposited. Conifer seed plants (like pine and spruce) are not supposed to have appeared until the Permian "times"; and yet, Clifford Burdick has reported finding pollen from such plants in the Precambrian and Cambrian series of the Grand Canyon of Arizona.[33] The earth is believed (according to uniformitarians) to have had no land plants of any kind before the Silurian "age"; and yet, Wilbert Rusch, Sr., has reviewed literature that reports vascular plant spores in the Cambrian strata.[36]

Uniformitarians teach that woody stems are supposed to have appeared no earlier than the Devonian strata, and the origin of wood is believed–in the context of evolution-to be hundreds of millions of years old. It comes as a shock then that Melvin Cook found valid wood specimens in Precambrian strata of Canada![37] He also reports that Dorf and Blais found fossil wood that gave a radio-carbon date of only 4000 years but was contained in "Late Cretaceus rubble." Since Cretaceus rocks are said to be over 100 million years old, a 4000 year carbon date for Cretaceus wood presents an insurmountable obstacle to uniformitarian historical geology.

Creationist workers are on the verge of demonstrating that many fossils which "ought not be present" in a certain "time layer" nonetheless exist, having never heard about the theories which they destroy by their very presence!

Morphology: Homology and Analogy

In the world of machines and human products we often find similarities between different devices. A stapler and a paper punch have a certain likeness of form and function. An automobile has numerous similarities to cars of other brands and even to motorcycles or minibikes.

Yet no sensible person imagines for a moment that the motorcar and the motorbike had a common ancestry, or that the stapler and the paper punch are descendants of the same family tree. We recognize each item listed as a separate product of human intelligence intended for particular purposes.

Creationistic biologists can use this same reasonable approach to the field of plant and animal structure. If we find that a squid and a human being have eyes that are amazingly alike, we may accept this as the design of the Creator who fashioned each for a special purpose. The creationist is not obligated to assume (as evolutionists do) that "likeness must imply kinship." In fact, the evolutionary obsession here leads to great confusion.

Morphology is the branch of botany or zoology which deals with the form and structure of organs. Some of the similarities between the organs of different species are quite deep and of underlying structural significance (as in the correspondence of finger bones in the human hand to comparable bones in the bat's wing).

Organs of structural likeness are said to be homologous, and evolution theory purports that they are good indicators of common ancestry. Yet there are some similarities that are only superficial and involve matters of appearance or function rather than basic structure-these are said to be analogous as in the case of the bat's wing compared with the wing of a butterfly.

This dichotomy of homology–analogy places evolutionists in the strange position of needing always to make metaphysical assertions as to which resemblances are really homologous (true) and thus indicators of common ancestry, and which ones are simply analogous (false, or superficial). Creationism abolishes this strange discrimination and views each similarity (deep or superficial) as a product of the Creator's handiwork and therefore quite likely of some functional significance.

A creationistic reappraisal of plant resemblances has been made.[38] Homologous structures of the duckweed, the palm tree, and the orchid plant would require that they all be classed among the Monocotyledonae (monocots). Evolutionary ideology must maintain that they are ultimately related because they all adhere to the monocot basic pattern of homology. Yet each is strikingly different from the other. The duckweed is a tiny, floating, aquatic plant; the palm is a stately tree; and the orchid is a showy herb!

These preposterous problems vanish when one assumes that each plant type is a "kind" formed by the Creator, and assumes that overall groups like the monocots simply trace the basic outline, pattern, or general plan which the Creator used in shaping many different plant forms.[39]

Evan Shute has reviewed a vast volume of literature and has shown that resemblances in the realm of chemistry would place some strange "bedfellows" together as evolutionary relatives.[18,40] He points out that animals would be directly linked to pussy willows, palms, and pomegranates in a bizzare evolutionary tree, if we used the presence of oesterone (female sex hormone) as our guide. Howe has demonstrated by the same token that we would have to place the corn plant close to both the human liver and the blue green algae in phylogenies because all three form glycogen.[41]

More morphological studies of plant similarities and differences will pose multitudes more bizarre and preposterous problems for evolution theory.

Problems from Pre-biologic Botany

Evolutionists have recently attempted to resurrect the defunct theory of spontaneous generation. Some believe that life somehow developed from non-living matter long ago in a primordial puddle. Most questions that cluster around these "origin of life" speculations are of biochemical nature and thus lie beyond the scope of this botanical survey. There are one or two aspects of the controversy, however, which involve the life and activity of plant cells.

The hypothetical puddle, brew, soup, or whatever it should best be called, is supposed to have yielded amino acids which then formed proteins. The same theoretical habitat is believed to have fostered nucleotide molecules which linked (somehow) to make DNA (a complex chemical which is believed to transmit the hereditary code).

Yet all of this is said to have occurred in an atmosphere that was almost completely devoid of oxygen. "Oxygen had to be absent," a devout evolutionist would argue, "because otherwise no life would have arisen." Experiments have been performed by Melvin Calvin and others showing that if oxygen is present to any extent in modern brew experiments, the yields of amino acids and other biological precursor molecules are astoundingly low!

Since the evolution theory is unalterably linked to the proposition that life had to arise naturally, some apologists assert that oxygen was absent in early times as the reserves of amino acids and nucleotides were accumulating and as life was finally arising. Oxygen must have been missing in such a scheme, or the soup theory would spring a logical leak!

How then did oxygen finally appear, according to this modern version of spontaneous generation theory? The first living cells had to be anaerobic, or able to exist where no oxygen was available. After much time, mutation, natural selection, and origin of ancient species, anaerobic cells are believed to have "evolved" chlorophyll, chloroplasts, or whatever other cellular organelles essential to the first photosynthesis reaction. This view assumes that photosynthesis, with its production of oxygen gas, "evolved" only after ages of anaerobic life had elapsed.

Botanical Fallacy Reported

A botanical fallacy has been seen here and is reported in at least one of the creationist papers.[42] If plant cells are to produce oxygen (and indirectly ozone–O_3–which forms from oxygen primarily in the ionosphere and upper stratosphere) only after ages of evolution, then life had to evolve originally when there was absolutely no layer of oxygen or ozone to shield the earth from direct solar radiation.

Sunlight, unfiltered by ozone, is rich in the potent ultraviolet rays which rupture chemical bonds in protoplasm and thereby destroy life. Life exists on earth now only because we are shielded from direct ultraviolet rays by the blanket of ozone which our atmosphere provides. Here is the crux of a botanical dilemma facing evolutionary speculations— (1) If oxygen were present in the beginning, there would have been no evolution (remember, there is only a low yield of biological precursors in brew experiments if free oxygen contaminates the mixture).

(2) But if oxygen was absent in the early atmosphere, there would have been no evolution either, because cells would have been destroyed by ultraviolet radiation. As soon as it came close to the surface of the puddle, each "little child" of evolution would have been decimated by the raw radiation of our sun unshielded by ozone.

Following this second horn of the dilemma further, plants would never have lived–let alone evolved chlorophyll and chloroplasts to carry out photosynthesis that would yield the oxygen and ozone which presently shields us. It looks more, reasonable that both plants and oxygen gas were formed by One who established a balanced ecosystem in a Creation Week, for evolution could have occurred neither in the presence of oxygen nor in the absence of oxygen.

Other writers have reviewed this same problem and likewise sense the force of the dilemma, Thick water layers or other shielding materials would be of no ultimate protection from death by ultraviolet radiation because the evolving plant cells would be forced to "come out from hiding" and face the sun rays sooner or later if photosynthesis was to be of any survival value in natural selection.[43] In his review of a recent symposium on spontaneous generation, T. L. V. Ulbricht drew attention to this botanical quandry and added, "If this ozone "barrier" were now suddenly to disappear, it is doubtful if life could survive on the earth."[44]

Another study that touches upon the prebiologic origin problem is the fiasco of Haeckel's *Monera.* Ernst Haeckel and other evolutionists tried to fill the gap between matter and life by originating a group of living beings that they preferred to call the *Monera.* These little bodies were supposed to cling right on the razor's edge between life and non-life.

N. A. Rupke has shown that many of the original *Monera* proved to be artifacts, or figments of an evolutionary imagination![45] Oddly enough, this fallacious name—''Monera''—is still used by some biologists to refer to the cells of bacteria and the blue-green algae. The bacteria and the blue-greens, however, are complex, modern organisms that do not lend themselves to fill-

ing the gap between matter and life. They too appear to have been created "after their kind."[41]

Bible Botanical Investigation

Some direct studies have been undertaken and more should be initiated evaluating statements in the Bible as they apply to the origin and history of plants. For example, Edward Young did great theological service by showing that there is no real conflict between the record of plant creation in day three (Genesis 1:11) and the record concerning plants in Genesis 2:5 and 6.[46] Events of day three were obviously worldwide, whereas statements about plant growth in chapter 2 may very likely refer specifically to the Garden of Eden, as Walter Lang has also asserted.[47]

Creationistic study of day three (Genesis 1: 11) mitigates against the origin of various plant species throughout vast geologic "ages." If there were epochs of geological time and if the modern geological column was reasonably correct, there could be no one "age" of plant creation because of the following obvious scientific reasons:

(1) Fossils of blue-green algae are known from Cambrian and Precambrian formations.

(2) Then according to the uniformity assertion, land plants appeared later in the Silurian and Devonian "times."

(3) Seed plants arrived millions of years later in Permian and Triassic ages.

(4) Flowering plants came on the scene only during the Cretaceus, which is still supposed to have come millions of years later than the seed plants.

(5) To interpret the day of plant creation as one geologic age would be quite difficult because plant creation would then span the entire geologic "timescale."

Furthermore, as Henry Morris has indicated, "The Bible states that all plants, even fruit trees, were made on the third day, while fish and other marine organisms were created on the fifth day. Geology reversed this order."[48]

Many Research Avenues Open

Many avenues of possible research confront the science-minded scholar of the Bible and its languages. More botanical inquiry should pursue the possible significance of the "Fall" (Genesis 3:18) in the origin and proliferation of thorny weeds. Botanists such as Edgar Anderson look at weeds as having an aggressive genetic character and as having become "camp followers" of man. Perhaps some detailed studies of weed genetics and physiology in the light of Scripture would be informative.

Thorns in various plants resemble diverse organs–leaf thorns, stem thorns, or just epidermal thorns as outgrowths of the stem surface itself. Some creationist should do a thorough study of these thorn organs. The idea that thorns arose independently in many different groups of plants is one point where both Creationist and evolutionist would probably agree–although the creationist stresses the importance here of the curse upon Adam.

Frank Marsh has evaluated this question and concluded that the thorns, thistles, and even disease germs are all the result of satanic activity within the permissive boundaries of God's will.[49] Although this is an interesting speculation, the Scriptures do not implicate Satan as the agency of thorns or thistles, nor as the architect of the viruses. Whitcomb and Morris have also analyzed in brief the curse upon the world of plants and have asserted that it affected not just the garden of Eden but the entire earth surface.

Genesis 10:25 possibly indicates a continental division and migration in the days of Peleg. Cook has delved into this matter of continental movement—a topic which is becoming more widely accepted in scientific circles generally.[37] The entire concept should be diligently applied to the study of plant geography. Could it be that forests in China or Siberia resemble parallel forests in North America or Europe because they were once closely connected?

As already suggested, thee-biological studies of various botanical problems could challenge interested students. However one caution must be given here. Although the Bible is a true book which is quite useful in the natural sciences, the worker must recognize where the words of Scripture stop and where the ideas of finite men begin. The human temptation is to read more into the Bible record than was originally intended. It is at this point that language scholars can team with scientists to produce worthy research products.

Plant Genetics

In the field of heredity, creationists have prepared significant papers. Many geneticists and plant breeders have successfully shown that there is variability within plant species and that whatever changes can occur will do so rather quickly—not requiring long periods of time.

This variability can sometimes be used for the benefit of mankind by producing roses to suit certain color choices or sweeter sugar beets to process at the mill. But variability remains within definite limits, and no really new kinds are formed when selection experiments are performed in the laboratory or the field.

Walter Lammerts (developer of "Charlotte Armstrong" and "Queen Elizabeth roses) has irradiated rose buds with a neutron beam to discover the kinds and nature of mutations that would result. Lammerts has clearly shown that although some mutations were obtained, they

were in all cases changes that reduced the natural vigor and growth potential of the plants.[50]

One or two of the changes in his experiment he judged to have horticultural potential, but even these came at the expense of general stamina in the plants involved. One of Lammerts' conclusions in this original, experimental study is most instructive: "Biologically, all of the mutations were defective variations from the pattern of development characteristic of the variety radiated."[51]

From his studies and innovations in the field of breeding moss and miniature roses, Ralph Moore has indicated, "Miniature roses, or any new roses, are really no more than the 'old' gene material in a different combination."[52] He shows how the scientific art of crossing various roses leads to a re-packaging of genic materials into roses that look new but that are nonetheless still roses. There has been no evolution of the kind involved at all in the rose breeder's amazing work.

William Tinkle has traced this same trend of rapid variation within fixed limits.[53] He points out that the first 78 years of selection in sugar beets for higher sugar content made dramatic improvement. But the sugar content climbed to a certain fixed limit thereafter and never went much higher. Once again, changes were evident but they were seen only within the confines of certain real boundaries. Incidentally, it almost goes without saying that these were still sugar beets throughout the entire period of the 124 years during which the program lasted!

DNA Is Hereditary Code

Whether we consider a plant or an animal body, DNA has come to be identified as the basis for the hereditary code. Creationistic chemists have emphasized the message of DNA as "complexity," "design," and "fixity," in living systems. Duane T. Gish has stated, "Rather than being the master chemical, DNA is the servant of the cells. Thus its operation is repressed by the cell until needed."[54] Gish believes that this very complex chemical structure of DNA should impress us more and more with the deep reasonableness of the creation concept, "In the beginning God created . . ."

Another outstanding chemist, John Grebe, has stressed the specificity of DNA as an argument supporting the creation of distinct kinds. He concludes that the "evolutionary theory has been postulated against ridiculous odds."[55]

In a study of mutations at the level of molecular genetics, Walter Lammerts indicates that changes in this wondrous code are often fatal and usually harmful. His creationistic conclusion based on an analysis of DNA is worth including here: "Molecular genetics shows the DNA code to be a marvelously complex one. Surely in studying it we are coming close to understanding how God is daily at work maintaining and preserving all creatures."[56]

Since there is considerable evolutionary agreement that gene mutation is the major source of variability for the whole process, it is obvious that in the world of plants and animals there will be little or no evolution because mutations are harmful, DNA is quite stable, and natural selection is largely a screen for elimination of bad mutations.

Chromosomes and Polyploidy

In a cell nucleus, chromosomes usually come in pairs. Thus, corn has 10 different kinds of chromosomes with two of each kind, or a total of 20 in each cell. For corn the number of different kinds of chromosomes (haploid number) is 10. The total number of chromosomes in a normal cell is twice the haploid number—the diploid number (20).

However some irregular corn cells have 40 chromosomes. An abnormal corn plant which would develop from such a cell with 40 chromosomes would have four times the normal haploid number of chromosomes, and would be called a "tetraploid."

Some plants studied appear to have one, two, three or more extra sets of chromosomes present and these are known as "triploids," "tetraploids," "pentaploids," respectively and are all generically known as "polyploids." Significantly both evolutionary and creationist writers have reported that polyploids are almost always less fertile than normal strains with two of each chromosome type, and they are sometimes completely sterile. Sterility may result in part from irregular pairing among chromosomes during the early stages of the special meiosis cell division which comes in the production of plant spores.

In his creationistic book[57] and in a recent paper,[58] John Klotz has provided detailed explanations and examinations of polyploidy and its possible role in evolution. He concludes that changes in chromosome number such as seen in polyploidy are not the kind of variation required by any major evolutionary step.

Karpechenko of Russia asserted years ago that he had witnessed the production of a new biologic species by polyploidy. He claimed that a cabbage had hybridized with a radish to produce a sterile daughter plant. But in this plant he believed that there was a natural doubling of the chromosome number so that a fertile and vigorous new genus was formed. Since *Raphanus* is the genus name for radish and *Brassica* is the name for the cabbage, Karpechenko dubbed this new type *Raphanobrassica.*

William Tinkle and Walter Lammerts have

shown that the entire basis of Karpechenko's claim of a new genus is in doubt because this work has not been successfully duplicated.[59] Others have tried and have found that the polyploid hybrid plants were not fully fertile and therefore do not qualify as a new biologic species.

More work is needed on the whole question of how much variability the Creator has permitted in plant life by this means of chromosome multiplication–polyploidy. Great evolutionary claims have been made but some of these experiments should be repeated and their real value in forming new adaptive kinds should be determined.

A Final Word

We may thank God for a revival of creationist thought within the disciplines of plant biology. This report is not intended, however, to be a summary of work that is complete and adequate. It is to be a prod to challenge botanists everywhere to consider their own debt to the facts that support Bible creationism.

Creationistic botanists face a further obligation to produce research and review materials that bring the claims of Scripture right into field and laboratory studies. It is a challenge to young people who have a mind for science that they consider botany as a vineyard where one may work for God.

If we liken the whole discipline of plant biology to a farmer's field (and if we may be permitted some liberty in reading a Scripture passage), then the fields are truly white unto harvest and we must pray the Lord of the harvest that He send forth workers. If Christian botanists and theologians direct themselves to this task, and if young minds are added (minds untrampled by the heavy footwork of evolution ideology), then it is conceivable that the theoretical framework in this whole discipline can be brought back to reality by being brought back to God.

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INTERESTING PUBLICATION

"Creation: Fact or Fiction?" by Harold W. Clark. 1969. Private Publication: 600 Edgermont Avenue, Angwin, California 94508. Pamphlet: 20 cents for single copy, postpaid; 15 cents each for five or more copies, postpaid.

Because a number of Christian scholars have expressed doubt as to the validity of some of the basic concepts of "literal creationism," the author has penned a compact and concise consideration of 23 problem questions. After the first question, "What is literal creationism?", Harold Clark meets such questions as: "Is the Genesis record valid?", "Were the days of Creation real days?", "How did man originate?", "Upon what is the concept of a universal Flood based?", and "After all, do you consider that these 'evidences' prove the Flood theory?"

In response to these typical questions the author presents simple statements of the basic truths of literal creationism. He cuts through customarily lengthy treatments of controversial subjects to bring the reader face to face with studied conclusions that literal interpretation of the Genesis record of creation and the Flood stands on firmer ground today than ever before.

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