THE DIFFERENCE BETWEEN ACQUIRED CHARACTERISTICS AND MUTATIONS

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Studies on mutant plants have been reported previously in the *Quarterly*.[1,2] It was found that mutants were less vigorous, less fruitful, and generally less viable than normal plants.

However, not all changes are mutations. Characteristics may be acquired, maybe by some accident. These are not transmitted to offspring. The present studies illustrate that not all differences are due to mutations. They also suggest that a study of the next generation is a good way to see whether a change is in fact a mutation.

When the previous studies were reported the reports dealt with tomato, *Esculentum*, and campion, *Lychnis alba*, which came up with three cotyledons instead of the normal two. Observation in following generations established that this character is a mutation, recessive and mildey harmful to the plant in that less fruit and seed are produced; also that the mutant plant has less vigor in that it is harmed more than the normal plant by transplanting, lack of light, and cold temperature.

New Observations

In 1976 and 1977 I have made observations on a plant of the Solanaceae family popularly known as sweet pepper or mango. A plant came up with but onecotyledon, and half sized, instead of the normal two. While it is evident that extra cotyledons must be due to a mutation in the gene, this change was not so easily classified; it might be due to an accident in growth.

Geneticists are agreed that changes caused by the environment, or use or disuse, acquired characters, are not inherited by the offspring.[3] Such changes do occur and sometimes are large; but they do not appear in future generations in the absence of the environment which called them forth.

To learn more about this sweet pepper plant with but one-half cotyledon I planted it beside a plant with two normal cotyledons, having no other striking difference in morphology. At the end of the season I counted the seeds produced: two cotyledon plant:139; one-half cotyledon plant: 208.

Such a difference might be significant if one were comparing large groups of plants which differ in only one character; but in small numbers of individuals it may be due to hereditary dissimilarities other than cotyledons. Again, in a pure line, where the plants all have like genes, due to self pollination and selection, such a difference should not be ignored.

Another Planting Results

I planted a number of seeds from both plants. All the resulting plants (17 from the one-half cotyledon plant, 6 from the other) had two cotyledons. I interpret these results to show that the loss of 1½ cotyledons was due to an accident; that this is an example of an acquired character and not a mutation. Of course such a conclusion could not be drawn from the appearance of an *extra* part which appears in future generations.

There should be more studies of variation. In scientific literature there are many reports of mutations; but often they stop short of telling whether these are harmful or beneficial.

References

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[2]Tinkle, William J. 1975. Further research on reduced viability of mutant plants, *Creation Research Society Quarterly* 12(1):52.
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SEVENTEEN PROBLEMS FOR EVOLUTIONISTS

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This article is mainly a survey and review of portions of the literature of particular interest to creationists. As a teacher the author found that textbook authors present evolution as an assured fact, and rarely mention any problems or objections which might be raised. But there are many problems, which, in the author's opinion, are fatal to the dogma of evolution. Some of those problems are presented and discussed.

Statement of the Question

There are two commonly held definitions of "evolution". One indicates *variation or genetic change observable in a kind.* The other, more popular conception of evolution, is that of *general evolution with great changes over vast epochs of time to account for all living things from a common ancestory which arose by biochemical evolution.*

Natural selection operating on gene mutations and gene combinations is the proposed mechanism for evolution. Authors of the *B.S.C.S. Text - Yellow Version* for instance, takes this position (see Figure 1):

> Selection, whether artifical or natural, sorts out particular gene combinations, and so can bring about genetic differences between different lines

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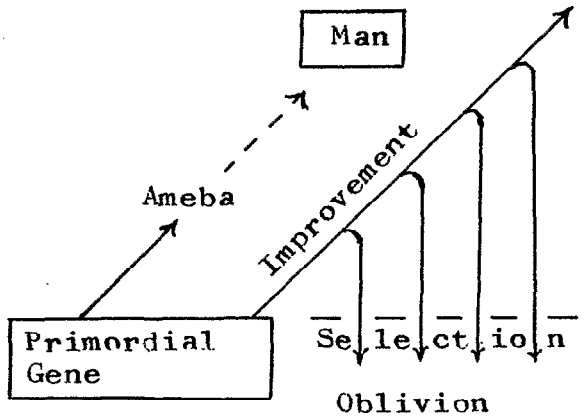

Figure 1. Evolutionists claim that, beginning with some primordial gene, the numbers, kinds, and combinations of genes increased, to the stage of ameba, and eventually of man. Meanwhile natural selection acted as a sieve, to sift out bad genes. But who ever heard of a sieve creating anything new?

> derived from the same population. Each selected line has less variability than the unselected population from which it was derived. If selection does not occur too rapidly, mutations, can gradually *repenish the store of genetic variability* and make still further selection possible.[1]

Experiments on the artificial selection for oil content in corn are used as an illustration of a sorting out of particular gene combinations.

> In corn, selection had a strong effect and was still producing some changes in the population even after 45 to 50 generations of continuous selection.[2]

The authors also state that it is not very likely that mutations caused the changes in the oil content. Instead, "all or nearly all have existed in the population before selection began".[3]

These lab experiments demonstrate that selection can operate on gene combinations and thus produce variations in population. Also, the effect of selection within a kind seems to be limited. Lammerts[4] states that most have modifying effects and selection can only produce limited results. He gives bud length in roses as an example. The ultimate length in buds is achieved in five or six generations. Also, yield in corn is limited at the point at which all major factors for yield have accumulated through sexual reproduction.

It would seem that genetic recombination through sexual reproduction only produces variations within a kind; and that selection of different gene combinations is only effective up to a point.

The only other possible source of genetic variability, on which natural selection can operate, are mutations. There are three basic kinds of mutations known to occur: (a) structural chromosome changes, (b) gene mutations, (c) changes in chromosome number. But there are problems.

Problem One: Structural Changes in Chromosomes are Most Often Deleterious and at Best Only Produce Variation Within a Kind

Structural changes in chromosomes involve chromosomal rearrangements such as inversions, translocations, deletions, duplications or combinations of these. Deletions occur when a portion of a chromosome breaks off and is lost. An inversion occurs when a portion of a chromosome broken off, reversed and then attached on the same chromosome. A broken piece of chromosome could also become attached to the homologous chromosome (duplication) or to a non-homologous chromosome (translocation).

John N. Moore states that all reports on structural changes in chromosomes show that these changes are only effective in producing variation within a species or gneus. "*Never* do we find reports of research on structural or numerical changes of chromosomes that may be used to document any true genetic relationship between major groups of animals or major groups of plants".[5]

The argument that structural changes in chromosomes can provide sufficient genetic material for general evolution is not based on any present empirical data.

Problem Two: Observed Mutations Have Resulted in Changes Only in Existing Traits

Gene mutations involve a permanent inheritable change in a gene. Many evolutionists state that gene mutations are the main source of genetic variability. Moore[6] quotes Dobzhansky:

> Replication of genes has long been recognized as an important evolutionary (phylogenetic) process. On the *assumption* that primordial life was represented by a single gene, the thousands of different genes now found in the same gamete in most organisms must be the diverged descendents of the primordial gene.[7] (Emphasis added)

Moore[8] states moreover that all known gene mutations result in no new traits but only changes in existing traits. He cites reports such as Potter[9] and Taylor[10] in this respect.

Dowdeswell[11] states that gene mutations are confined to a "comparitively small and limited range of possible changes". Also, successive mutations show no directional trend and mutations are *restricted* to specific loci. This point is very important, but often overlooked.

Klotz[12] quotes Carson, "One of the great dilemmas that modern evolutionary theory has had to face is the fact that most of the mutations found repeatedly, for instance, within populations of different *Drosophila* species, do NOT constitute the kind of differences which distinguish species".[13]

Problem Three: Mutations Are Harmful or Useless

Dowdeswell states:

> Some mechanism for the perpetuation of mutant genes is essential as a basis for genetic variation. Indeed without it our whole concept of particulate inheritance would be meaningless. Realization of this has prompted *widespread experimental studies during recent years*; the results obtained have certain fundamental features in common. Of the many mutants detected in the laboratory, all are either recessive or "semi-dominant", and the majority cause harmful physiological effects. hardly any have ever been observed which could possibly be

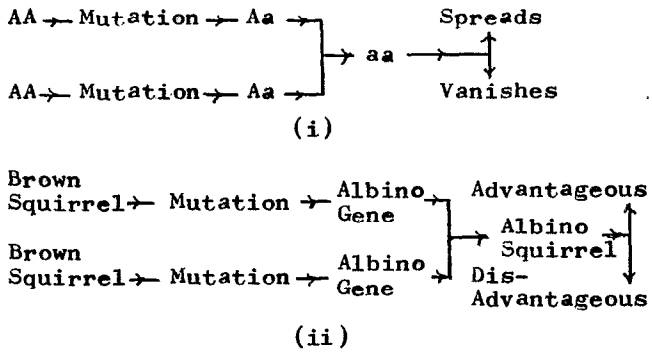

Figure 2. A mutation might change a gene *A* to a neutral recessive gene *a*. If two *a*'s should come together in sexual reproduction, a mutated organism would arise, as shown in (i), and if the environment should become favorable it would spread; otherwise it would vanish. Part (ii) shows how it is suggested such a thing might happen with squirrels, if some change should give them a light coloured background.

beneficial to an organism under wild conditons.[14] (Emphasis added)

Dowdeswell then goes on to state that caution should be used in interpreting data. he argues that (a) most present day mutations have taken place before, (b) any beneficial mutation is incorporated very quickly in the population, and (c) such beneficial mutations become progressively less apparent for study since they have been already preserved and incorporated.

One thing is very clear, evolutionists have made predictions in genetics, and conducted widespread experiments; but their dogma has failed the empirical tests. So, to preserve the "theory", they find it necessary to pile one hypothesis upon another. How could one know that beneficial mutations have taken place before, and that they have been incorporated very quickly and are now less apparent for study? Clear-cut beneficial mutations are exceedingly difficult to demonstrate. Most often evolutionists write about "neutral mutations" which exist supposedly in the popultion till an environmental change occurs at which time they *may prove* adaptive.

Lammerts states that the "enthusiasm for demonstrating evolution by a study of induced mutations has died out, since clear-cut cases of obviously advantageous mutations simply do not occur".[15] His work with roses shows that although induced mutations may have horticultural value, they are always less viable or fertile than the original. Many similar studies could be cited.

Recent studies on bacterial resistance to penicillin by way of induced mutations have been cited as examples of beneficial mutations. (Also described thus on page 578 of *B.S.C.S. Yellow Version*). But more recent studies[16] indicate that this is not due to exposure to penicillin; but rather that the mutations occur at a constant rate.

Also, resistant strains have decreased viability under normal conditions; and thus the population soon reverts back to normal type soon after treatment is relaxed or stopped. The B.S.C.S. authors also discuss resistance to DDT exposure. "Here a miniature evolution unfolds before our eyes."[17] Klotz[18] discusses studies which indicate that resistance to DDT declines with time. Some researchers suggest that DDT itself initiates the production of certain DDT-resistant factors in the cytoplasm. Thus DDT resistance as "miniature evolution" could be questioned.

Gish[19] cites Thompson as stating that "all mutations are either useless, harmful, or lethal".[20] Some evolutionists state that over 99% of all mutations are harmful. Thus to say the least beneficial mutations are indeed rare.

B.S.C.S. Text - Yellow Version does not present the student with one single clear cut case of a beneficial mutation. Instead the authors *suppose* a situation of preadption where a mutation would be neutral and recessive thus enabling it to exist in the population till an environmental change would occur. Simultaneously with this *favorable environmental change* would be the coming together of these two *now beneficial recessive mutant genes* through sexual reproduction (see Figure 2). No example of this ever happening is given and for very obvious reasons.

Problem Four: The Mutation Rate is Very Low

Gish[21] cites Tinkle's work on *Drosophila* which shows "that the mean life of a gene (that is, the average time elapsing without change in any particular gene and its descendants) approximates 100,000 years".[22]

The frequency of mutations is estimated as 1 in 100,000 gametes per generation. When one considers mutation rate and frequency of mutations together with the observation that well over 99% of all mutations are harmful, it is of "little wonder" that evolutionists like Goldschmidt realize that evolution by way of micromutation and natural selection is just too slow, even if one provides for vast epochs of time. However, if one *assumes* enough gametes, in enough generations, over a long enough period of time, some change may seem possible.

Problem Five: Homozygous Mutants Would Tend to Eliminate A Species

Even allowing for 1 in 1000 mutations to be of an advantage, it would seem that in only a few hundred generations, homozygous genotypes having a harmful effect would result and outweigh the advantageous ones, and thus tend to eliminate the species. That this has not yet happened may indicate a relatively short time of a species (Figures 3, 4 and 5).

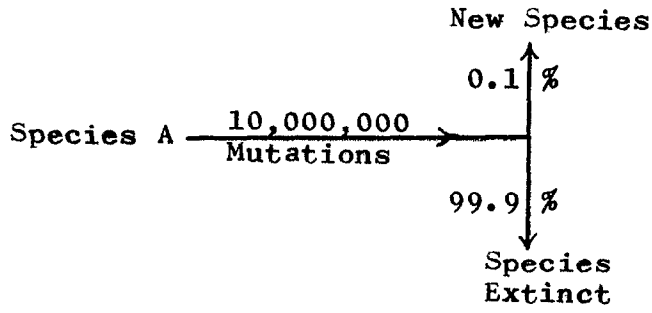

Figure 3. Only something like 0.1 % of the mutations would be favorable, possibly leading to a new species. The rest are likely harmful, and would lead to extinction.

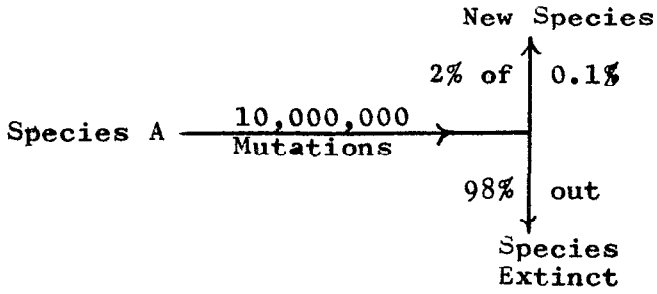

Figure 4. Moreover, the good mutations proposed in Figure 3 were along with bad ones, and would tend to be eliminated along with them. In fact, in the case proposed here, only about 2% of 0.1% of the original mutations would be good ones which would survive.

Problem Six: Mutation, Organismic Complexity and Adaptation

Another problem with gene mutations as the source of genetic variability for general evolution is cited by Lammerts. "The more complex the organism the less chance there is for mutations to occur of advantage even under new environmental conditons."[23] Also, some evolutionists[24] believe that due to selection of mutation suppressors, the rate of mutation decreases as a population becomes adapted and established. If this is so, it would seem that evolution would become increasingly more difficult, thus adding to the problem of time.

Problem Seven: Any Mutation is Likely to Upset the Delicate Gene Complex

The term gene complex refers to the sum total of all genes possessed by an organism. Any change in a gene affects the delicate balance of the whole gene complex and thus the steady state of the organism. The larger the change in the gene, the more likely it is to prove harmful. The suggestion that macromutations could account for the "explosive jumps" in the fossil record is certainly open to debate—especially in view of what is being learned about the many beautifully balanced physiogenetic systems in living organisms, which would have to mutate together.

Problem Eight: The Origin of Dominance Does Not Have a Suitable Explanation

Klotz[25] discusses the suggestion by Ford that a dominant gene can arise from a gradual process by which a recessive gene becomes neutral and then eventually becomes dominant. Other investigators suggest that certain suppressor genes cover up harmful mutations while other enhancer genes increase the potency of others and thus gradually transform some genes into recessive genes while others become dominant. Klotz then cites a critique of the above suggestions by Wright and Haldane.[26]

Most wild type genes are dominant and most mutations are recessive. A dominant mutation would seem to have lethal effects on the balanced physio-genetic system of an organism. Klotz concludes that the origin of domiance does not have a suitable explanation at the present time.

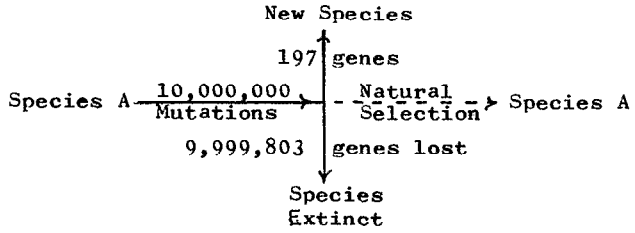

Figure 5. As for natural selection, it acts much more to preserve the status quo. For, as shown in Figures 3 and 4, only a few of the new genes survive; the net effect is to keep species A much as it was.

Problem Nine: Reverse Mutations Add to the Problem of Time Required For Mutations

According to Klotz[27] some evolutionists, such as Romer, give paleontological evidence for reversal of evolution. Klotz also discusses Muller's[28] research which indicates that most mutations in *Drosophila* are capable of reversing and that very often they revert back to the original gene. Others state that, in spite of reverse mutations, it is difficult to imagine evolution as actually reversing, since it would require identical or similar environments occurring two times. In any case, if a mutation takes three steps forward and then two steps backward, the problem of "waiting" is increased.

Problem Ten: Polyploidy is an Evolutionary Dead End

Polyploidy is also cited in B.S.C.S. texts as a proposed source of genetic variation. *Raphanobrassica* is given as an example. This plant is the F_2 plant of a cross between a radish and a cabbage. (See page 602 *B.S.C.S. Yellow Version*). In this experiment haploid gametes (n = 9) from a radish and haploid gametes (n = 9) from a cabbage produce a sterile F_1 hybrid (2n = 18). Occasionally this F_1 hybrid produces a diploid gamete (2n = 18), two of which may fuse to produce a F_2 plant (2n = 36) (See Figure 6).

The *Yellow Version B.S.C.S.* Text states that this *F_2 plant is a distinct species* because fertile offspring cannot be formed when it is crossed back with the original diploid and because it is fertile with itself and breeds true.

Lammerts[29] cites a more detailed study by Richaria and Howard[30] in which they obtained quite different results: (a) Many of the F_2 had fewer than 36 chromosomes; (b) Pollen of these plants with 36 chromosomes had from 17 to 19 chromosomes, not just the 18; (c) the F_2 plants were only partially fertile; (d) the F_4 plants had chromosome number of 33 to 37 and their fertility varied from 5 to 42%. Thus it would seem that the claim that a new genus or species had been produced is open to question.

Perhaps many polyploid species are not really different species but only different races or ecotypes of the same species. For example, Hancock[31] describes three races of *Galium palustre*. The diploid (2n = 24) is found in damp places, the tetraploid (2n = 48) is found in wetter areas and the octoploid (2n = 96) is found in permanently wet areas.

Also, Lammerts[32] cites some recent investigations which indicate that some so called polyploid species

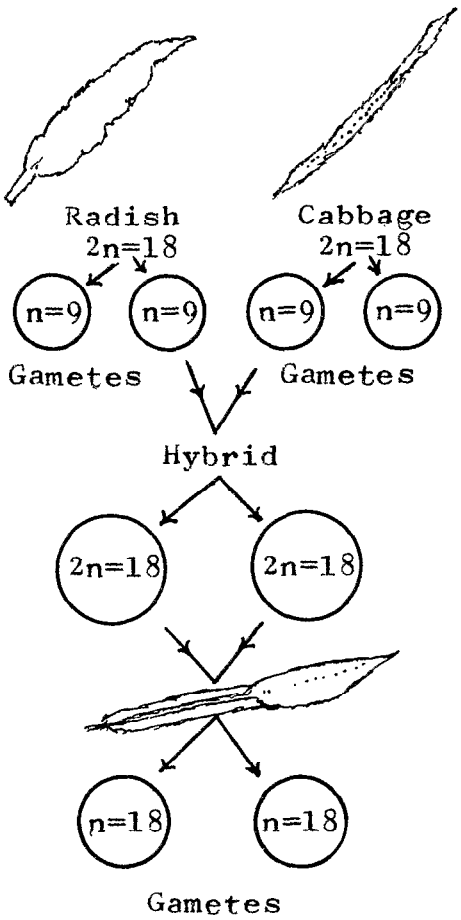

Figure 6. This shows how the radish and cabbage are supposed to produce a hybrid. The F_1 hybrid is usually sterile. But if it is fertile, an F_2 hybrid can be produced, and claimed to be a new species. But see the problems under "Problem Ten".

may not be the results of polyploidy but rather the result of a loss of chromosomes.

Colchicine treatment of plants has produced polyploidy in plants by inhibiting the development of the spindle, thus the chromosome number doubles. However, these tricks are artificial and cannot be used as evidence for polyploidy as a source of genetic variability in nature.

Aneuploidy occurs in a species where the chromosome numbers are not multiples (See Table 1).[33] The differences between these races are sometimes quite small.

Another kind of polyploidy is allopolyploidy (See Table 1). Here, two fertile species are crossed producing an infertile F_1 (a result of a lack of homology in chromosomes). The F_1 chromosome number then becomes doubled through some irregularity. Thus the cell can undergo homologous pairing during meiosis producing gametes. For example, when *Triticum* (wheat) (2n = 42, n = 21) is crossed with *Secale* (Rye) (2n = 14, n = 7) the F_1 diploid zygote (2n = 28) doubles its chromosome number and becomes Triticale (rye-wheat) with 2n = 56, an allotetraploid.

Some cytologists and geneticists have made much of chromosome homology studies. In these studies the claim is that a relationship of two species can be inferred where the F_1 hybrids show loose pairing of

Table 1. this shows and compares the complement of chromosomes for the various basic types of polyploidy. In the right-hand part, C, B, A, and S are nonhomologous chromosomes. See reference 33.

Type of Polyploidy	*Shorthand Formula*	*Chromosome Complement*
Aneuploidy		
monosomic	2n − 1	(CBAS)(CBA)
trisomic	2n + 1	(CBAS)(CBAS)(C)
tetrasomic	2n + 2	(CBAS)(CBAS)(C)(C)
double trisomic	2n + 1 + 1	(CBAS)(CBAS)(CA)
Euploidy		
monoploidy	n	(CBAS)
diploid	2n	(CBAS)(CBAS)
triploid	3n	(CBAS)(CBAS)(CBAS)
autotetraploid	4n	(CBAS)(CBAS)(CBAS)(CBAS)
allotetraploid	4n	(CBAS)(CBAS)(C'B'A'S')(C'B'A'S')

chromosomes during metaphase of meiosis. The argument is that these chromosomes are at least partially homologous and thus the species are related.

Lammerts[34] describes a number of studies which indicate that this is non-homologous pairing, occurring at a stage at which the cells' regulatory mechanism noramlly would cause orderly pairing. However, when only non-homologous chromosomes are present, partial pairing may occur as a result of the functioning of this regulatory mechanism.

Lammerts identifies some criteria for an amphidiploid (See Table 1) to qualify as a species "(a) the original F_1 hybrids should show no pairing, yet give a reasonable percentage of diploid gametes, (b) the experiment should insure conditions such that *only* self-fertilization should occur, and (c) fertility and vigor of the F_2 should be at least comparable to that of the diploid species."[35] Using these criteria, some polyploid species may not actually be different species from the diploid but only races or subspecies.

Klotz[36] cites the work of Ehrlich and Holm[37] on polyploidy. It would seem from their work that polyploidy is generally disadvantageous. Klotz also states that polyploidy is an evolutionary dead eand.

SRB, Owen and Edgar[38] state that, even though a third or more of the species of angiosperms are polyploids, one must observe caution in using this as an argument for the evolutionary significance of polyploidy. A number of problems are discussed:

(a) Autoploidy adds no new genes to gene complexes.

(b) The phenotypes of autoploidy are usually just exaggerations of what is already in the diploid.

(c) Allopolyploids are most often intermediates having no really new characteristics.

(d) Polyploidy once developed makes for a certain kind of inflexibility. Mutations to the recessive form of a gene have a reduced chance of expressing themselves phenotypically in polyploids.

(e) One of the frequent immediate consequences of polyploidy is reduction in sexual fertility.

(f) Polyploidy seems to become established more readily where asexual reproduction is possible. Thus there is also loss of genetic recombination through sexual reproduction.

Table 2. This is a list of the chromosome numbers in various species of animals and plants.

Species	*Number (2n)*
Copepode - crab	6
Drosophila	8
Broad bean	12
Garden pea	14
Onion	16
Corn (maize)	20
Opossum	22
Tomato	24
Mink	30
Fox	34
Pig	38
Mouse	40
Rat	42
Rabbit	44
Man	46
Deer mouse	48
Striped skunk	50
Spectacled bear	52
Cebus monkey	54
Donkey	62
Horse	64
Aulacantha Protozoa	1600

Klotz[39] discusses research and observations on polyploidy by Stebbins. It would seem that changes necessary to produce new genera, families, orders, and phyla probably did not come about because of polyploidy.

Problem Eleven: Chromosome Number and DNA Content Vary Widely Between Alleged Evolutionary Levels

According to the monophyletic explanation of relationship of living things, present day organisms evolved from unicellular organisms. Thus one would expect an increase in chromosome number and DNA with increased complexity. J. N. Moore[40] shows that there just is no pattern with respect to chromosome number or DNA content (Tables 2 and 3).

Some evolutionists hypothesize genetic redundancy at lower levels. However, J. N. Moore quotes Dobzhansky as stating "whether or not redundancy increases systematically from the less complex to the more complex organisms remains to be seen".[41] Here again is an untestable spin-off hypothesis to account for data which contradict the evolution model. It would seem that present data best fit a polyphyletic explanation of variation within a kind.

A study of gene mutations, structural changes in chromosomes, and numerical changes in chromosomes shows that the genetic variability of a species is limited to variations within a "basic kind". Even allowing for "great" beneficial mutations and great epochs of time,

Table 3. This shows the estimated amounts of DNA, in units of 10^{-12} gram, per haploid chromosome complement, in various animals or other cell types.

Amphiuma	84
Protopterus	50
Frog	7.5
Toad	3.7
Man	3.2
Cattle	2.8
Green turtle	2.6
Carp	1.6
Duck	1.3
Chicken	1.3
Sea urchin	0.90
Snail	0.67
Yeast	0.07
Colon bacteria	0.0047
Bacteriophage T2	0.0002

can natural selection change one kind of organism into another?

Problem Twelve: Even Allowing for Beneficial Mutations, Natural Selection may be too Slow to Account for Alleged Evolution

One problem with natural selection is the rate. Howe and Davis[42] cite a calculation by Klotz[43] of 1,000,000 generations for a recessive gene, with a generous selection coefficient of .01 to pervade 99.9% of a gene pool. (1% would mean that 1000 *aa's* will survive for every 990 AA or *As's*.) Also, Dodson[44] calculated 321,444 generations for a slightly helpful recessive gene to go from the level of .000,001 to .000,002 (from one in a million to two in a million) in the gene pool. Howe and Davis[45] conclude that a bear that gives birth to its young once each year would require 1,000,000 years to establish a new gene throughout all or nearly all of its population (See Figure 7).

Also, if it requires 1,000,000 years for one rarely occurring beneficial mutation to permeate a gene pool, one must seriously question Simpson's[46] estimation of 6,250,000 years for the production of a genus. Howe and Davis state how Simpson gets around this problem in the alleged evolution of the horse. Simpson estimates enough mutations (1,500,000) in enough individuals (1,500,000,000,000) to change *Hyracotherium* (an animal very similar to the *Hyrax* of today into the modern horse. But has he not just assumed natural selection and then calculated the mutation rate required?

A similar problem occurs when one tries to account for the "explosion" of fossils, of all major groups and subgroups of fishes, reptiles, amphibia, birds and mammals supposed to have evolved in a similar short period of time.

A number of evolutionists realize the above problem. Dodson[47] quotes Dobzhansky ". . . the number of generations needed for the change may, however, be so

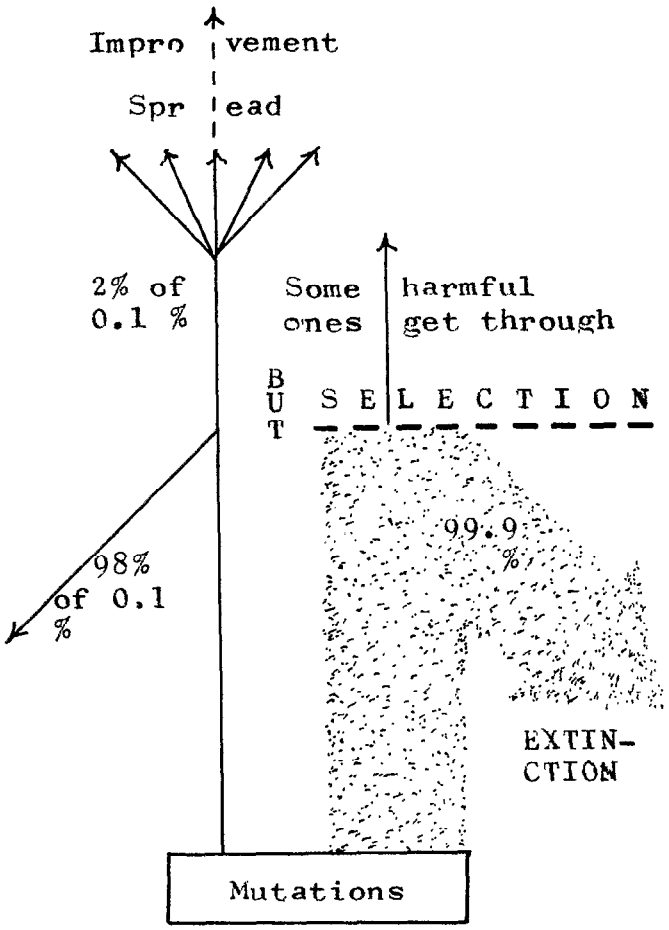

Figure 7. This illustrates how most of the mutations, good or bad, are lost, only a tiny fraction getting through to produce anything. But despite that, some bad ones do get through, as well as the good ones which are supposed to spread and to lead to improvement. This causes problems, as discussed "Problem Four", "Problem Five", and "Problem Twelve" in the article.

tremendous that the efficiency of selection alone as an evolutionary agent may be open to doubt, and this even if time on a geological scale is provided".[48]

Gish[49] cites Goldschmidt as an ardent evolutionist who has argued a strong case against the neo-Darwinian natural selection mechanism of evolution, accepted by 99% or more of all evolutionists.

> The facts of greatest general importance are the following. When a new phylum or other class appears, there follows a quick, explosive (in terms of geological time) diversification so that practically all orders or families known appears suddenly and without any apparent transitions.[50]

Gish states the following:

> Dr. Goldschmidt believed that all the major animal types must have evolved instantaneously. He called his mechanism the "hopefuly monster" mechanism. He proposed, for example, that at one time a reptile laid an egg and a bird hatched from the egg! Every place in the fossil record where a gap exists, he proposed that a similar fantastic event must have occurred.[51]

Problem Thirteen: Too Rapid a Rate of Natural Selection May Eliminate the Entire Population

Klotz[52] quotes Mayr as to yet another problem in natural selection. "Selection places a considerable strain upon populations. Too rapid a rate of simultaneous selection against too many genes might eliminate the entire population," (see Figure 7). The dilemma seems to be that too strong a selection would be lethal. Yet, selection must be very rapid to account for the "explosive" fossil record and even within the billion of years depicted in most geological tables.

It is of interest to note that the geological table as depicted in books is coming under heavy scrutiny today. For example according to the work of Gill and McDougall the Miocene-Pliocene division may not be 12 to 13 million years (See *B.S.C.S. Yellow Version* p. 620) ago, but only 4 to 5 million years ago.[53,54]

Similarly, Gish states that Leclerq has published the fact that spores and fragments of woody plants, including those of pine trees, have been found in Cambrian rocks.[55] Also Daniel Axelrod of the University of California, Davis, reports the finding of spores of 60 genera of wood plants in Cambrian strata. It would seem that some of these observations in paleontology and earth history may even require a greater strain on natural selection than what was required before.

Problem Fourteen: A High Percentage of Favorable Mutations Are Eliminated From a Population

Even favorable mutations are likely to be eliminated. Klotz[56] discusses Fisher's calculation "that out of 10,000 mutations which have a generous one percent selective advantage, 9,803 will eventually be eliminated".[57] Thus only 197 out of 10,000 favorable mutations can be expected to survive, others will be eliminated (by natural selection) together with unfavorable mutations.

The problem is that the mutation rate is low, the rate of beneficial mutation is very very low, and of these supposedly beneficial mutations only approximately 2% can be expected to survive (according to Fisher's calculation). Then one also requires that these two recessive mutations "all at once" come together simultaneously with the *right kind of environmental change* (As in Figures 2, 4 and 5).

Problem Fifteen: Genetic Drift Operates In Opposition to Selection

One way evolutionists propose to get around the slow rate of natural selection is through genetic drift occurring in a small population. Genetic drift is the statistical deviation that occurs in a small sample. Likewise, in 10 tosses of a coin you may get eight heads and two tails, but in 1000 tosses you would approach the theoretical 50:50 ratio.

Howe and Davis[58] investigate a squirrel population as an example of possible genetic drift. Squirrels with a recessive trait (aa) for albinism occurs in 1 out of 10,000 squirrels. Suppose that an isolated population of 20 squirrels in a remote part of a canyon suffer from some catastrophe, killing all but six of these 20 squirrels. If one of these six surviving squirrels happened to

be an albino, the frequency of albinism in the population would have risen very sharply.

Such genetic drift or high increase in the frequency of an allele could only be selected for if an environmental change occurred at the *same time*. In the above case it would perhaps be a rock slide exposing a new greyish area thus allowing for an advantage through camouflage. The question is, is the coincidence of this very likely, and can it account for the vast and rapid changes alleged to have occurred in general evolution? It would seem to me that a belief in this kind of timing of events would require a faith in the "miraculous".

Dowdeswell[59] rejects genetic drift on the theoretical grounds that (a) it is not likely that random survival can explain great fluctuations observed in large populations, (b) most genes have multiple effects which may complicate or negate a possible advantage to a mutation, and (c) a neutral gene (not advantageous or disadvantageous) could not exist neutrally long enough in the population for genetic drift to select for it.

Dodson[60] states that genetic drift results in the loss or fixing of genes without reference to selective value. That is, it tends to destroy or preserve genes without distinction. It would thus seem that genetic drift works in opposition to selection.

Problem Sixteen: Natural Selection Is Limited to its Effects on Population

H. T. Band[61] has studied the natural selection of *D.melanogaster* in natural outdoor populations. Lammerts, in a discussion of her work, states, "One of her most remarkable conclusions was that natural selection *does not* increase the most viable or best true breeding lines or homozygotes in natural populations"[62] See Figure 7.

Thus it would seem that natural selection is limited to what it can do about eliminating less advantageous variations and mutants. Also, species formation, by way of true breeding homozygous varieties, could be questioned.

Problem Seventeen: How can Mutation and Natural Selection Operate on Chemical Molecules?

Stebbins states:

> The arrangement of these molecules into functional systems that were self-reproducing, and their evolution finally into the first cellular organisms, can be explained by processes of chemical mutation, recombination, and natural selection similar to the processes that have been experimentally demonstrated to be responsible for change of microevolutionary order in contemporary organisms. Experiments by biochemists have shown that these processes can operated to produce progressive change in acellular systems similar to the processes that are postulated to have preceded the development of cellular forms of life[63].

Elsewhere Stebbins states:

> Organized structure, specific function, heredity, development, and evolution are the distinctive properties of life which are not even approached by those of the inanimate physio-chemical universe[64].

How can mutation and recombination work with chemical molecules? In one article Stebbins says it can occur (not how) but in another article he states that these processes do not occur with chemical molecules. It would seem that Stebbins wants it both ways and that he chooses the one that suits the particular circumstance in which he may find himself.

Summary

Dowdeswell states:

> One of the great merits of the present neo Darwinian theory is that, unlike any of its predecessors, it provides a workable explanation of evolution susceptible of scientific test. From this brief account it will be clear that experimental studies are still in their infancy; no doubt great advances will be made in the next few decades[65].

Elsewhere Dowdeswell states:

> Thus we know virtually nothing of the way in which hormone systems have evolved in plants and animals, and it is extremely difficult to picture the various transitional phases through which they must have passed[66].

It would seem that Dowdeswell realizes the problem; but notice that he is optimistic that someday somewhere a workable mechanism for evolution will be found. In the book, *The Mechanisms of Evolution* he describes observations and data in the lab and nature which support ONLY variation within a kind. Indeed, Dowdeswell states so in the last chapter, but then he writes that these limited variations help to explain the studies of paleontology, comparative anatomy, physiology and embryology. This seems to be an appeal for the reader to look elsewhere for the real evidence for evolution.

Comparative anatomy, physiology, embryology, and paleontology have lost much of their early appeal. This is a vast subject, but a few general observations may be made.

One cannot prove a theory by an observation, one can only refute it. Any similarities in anatomy and biochemistry can be accounted for equally well, if not better, within the special creation model. Indeed, if I eat the same food as a rat, why shouldn't my cells have molecules and structures similar to those of a rat[67]?

Also, according to Gish, many evolutionists no longer consider vestigal organs and embryology as evidence for evolution[68].

Gish concludes his excellent book, *Evolution: the fossils say NO!*, with a number of quotes from very prominent paleontologists. Simpson, with respect to transitional forms leading up to 32 orders of mammals, states:

> This regular absence of transitional forms is not confined to mammals, but is an almost universal phenomenon, as has long been noted by paleontologists[69]

Dr. Austin Clark of the U.S. Museum of Natural History has stated:

> Since we have not the slightest evidence, either among the living or the fossil animals, of any intergrading types following the major groups, it is a

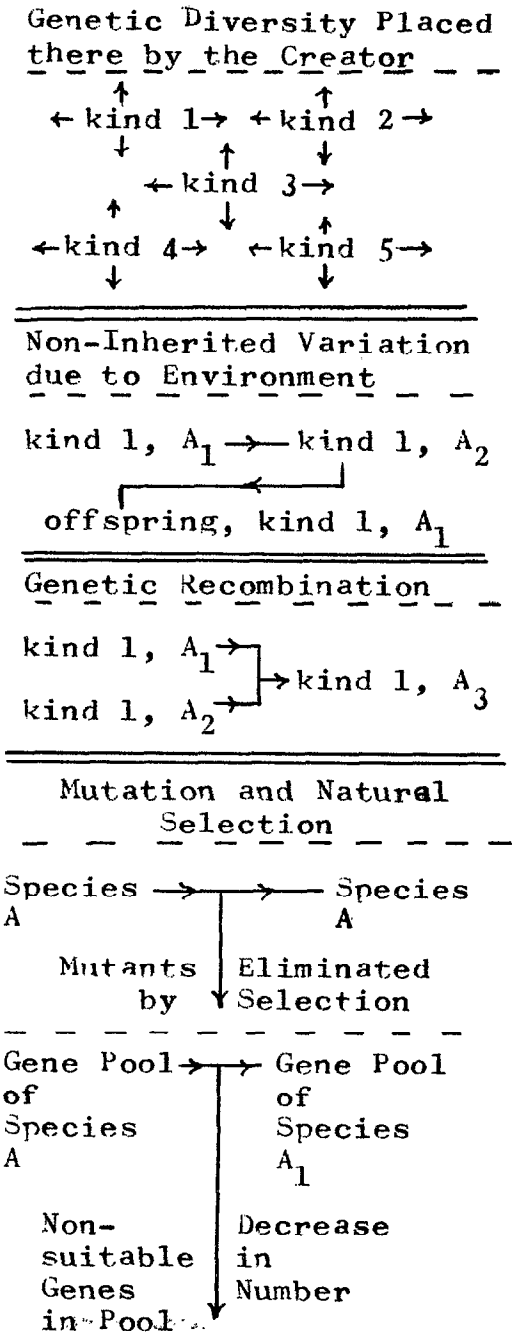

Figure 8. Creationists' views on the sources of diversity in living things.

fair supposition there never have been such intergrading types[70].

Dr. D. Dwight Davis, of The Chicago Museum of Natural History, has stated:

> A few paleontologists even today cling to the idea that these gaps will be closed by further sampling, i.e., that they are accidents of sampling; but most regard the observed discontinuities as real, and have sought an explanation for them[71].

Professor E. J. H. Corner, of Cambridge University Botany School, has said:

> Much evidence can be adduced in favor of the theory of evolution—from biology, biogeography,

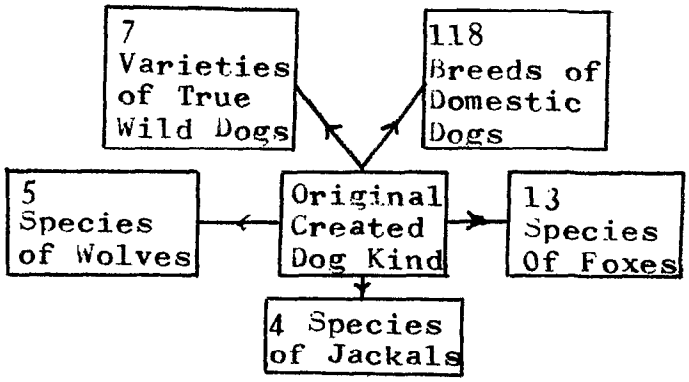

Figure 9. This shows how the original created dog kind (some creationists have called these created kinds "baramins") has diversified into many sorts of dog-like animal, all of which are known to interbreed. It should be noted that creationists do not necessarily hold that the originally created members of the kind (it is nowhere said that there were only two) were all identical. They might, perhaps, have differed as much as dogs and wolves now differ.

> and paleontology, but I still think that to the unprejudiced, the fossil record of plants is in favor of special creation[72].

The evolutionary model has led to predictions in genetics, embryology and paleontology which have failed empirical tests. Genetics and paleontology show only variation within a kind—exactly what is predicted by the special creation model.

What is the present status of the general evolutionary theory? Many evolutionists consider it to be only a working hypothesis. Still others consider it to be a well established fact.

Howe[73] quotes the famous botanist Herbert Nilsson as stating:

> My attempts to demonstrate evolution by experiment carried on for more than 40 years, have completely failed. At least, I should hardly be accused of having started from a preconceived anti-evolutionary standpoint...
>
> It may be firmly maintained that it is not even possible to make a caricature of an evolution out of paleo-biological facts. The fossil material is now so complete that it has been possible to construct new classes, and the lack of transitional series cannot be explained as being due to the scarcity of material. The deficiencies are real; they will never be filled[74].

Klotz[75] quotes a number of prominent evolutionists. For example, Fisher states, "the explanatory content of a theory of evolution only reaches its absolute zero with the mutation theory"[76]. Huxley states that "the complete proof of the utilization of mutations in evolution under natural conditions has not yet been given"[77]. Goldschmidt believes, that at the most, mutations can bring about changes only within a species[78]. Mayr states, with reference to Goldschmidt, the fact that some geneticists can come to conclusions diametrically opposed to those of other geneticists is striking evidence of our ignorance of the actual facts[79].

Klotz[80] quotes Ehrlich and Holm with respect to evolution: "It is, of course, a matter of debate as to where healthy conservatism leaves off and dogma begins. Suffice it to say that the discipline is at least

close enough to the danger area to call for some critical reexamination of its basic tenets.."[81]

Klotz also cites Sylvio Fials:

> . . . not a single step in the evolutionary mechanism has been clarified. Evolution means primarily an increase in the content of information in the case of DNA, but natural selection means only the elimination of error in information or mutation (in the most favorable case, only a modification of the information), not an increase in the quantity of information. Correcting a misspelled word or substituting one word for another is, after all, something quite different from writing down a sentence, an article, or a whole book[82].

Can genetic recombination, mutation and natural selection, account for the alleged evolution of organic molecules to primordial gene, from primordial gene to "proto cell", from 'proto cell" to amoeba, and from amoeba to man? It would seem that this question is certainly open to debate.

To hypothesize that these processes can and have done so *in the past* is to engage in an unfalsifiable hypothesis. It is unfalsifiable primarily because it is sufficiently vague to escape absolute refutation. The number of irrefutable spin-off hypotheses to account for contradictory data are many.

Also what has actually happened in the past (creation or evolution) is beyond experimental verification. Few textbook authors however, mention the many problems with respect to the alleged mechanisms of evolution. to the unsuspecting student it all seems very convincing, as if evolution were a fact.

I submit that widespread experimental studies on variation and population genetics give greatest support to the creationist model of variation within a basic kind. Also, the fossil record seems to show that these basic kinds have been distinct from the beginning, thus giving evidence of a unique instantaneous creation of these basic kinds.[83] This is illustrated in Figures 8 and 9.

Acknowledgement

As has been apparent, I have received much help in this work from the writings of many creationists, especially J. W. Klotz, Ph.D.; W. E. Lammerts, Ph.D.; J. N. Moore, M.S., Ed.D.; and D. T. Gish, Ph.D. I trust that this article reflects a true understanding of their research.

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REPORT OF THE 1977 MEETING OF THE BOARD OF DIRECTORS

The annual meeting of the Board of Directors of the Creation Research Society was held at Concordia College, Ann Arbor, Michigan, beginning at 6:00 p.m., 22 April, with a time of silent prayer. Present were: H. Armstrong, T. Barnes, D. Boylan, C. Burdick, D. Gish, G. Howe, J. Klotz, R. Korthals, W. Lammerts, J. Meyer, J. Moore, H. Morris, G. Mulfinger, W. Rusch, H. Slusher, W. Tinkle and E. Williams. W. Frair, the secretary, was still convalescing; William acted for him. There were two visitors: T. Aufdemberge and N. Skov.

T. Barnes, the President, who was in the chair, introduced the new member of the Board: D. Boylan.

Rusch, acting for Frair, reported on the election of members of the Board of Directors, held earlier in the year. Elected were: H. Armstrong, T. Barnes, D. Boylan, D. Gish, W. Tinkle and E. Williams.

Korthals, the Treasurer, reported on finances. The income for the year was $34,266.85; the expenses $28,853.11. The balance in accounts on 31 March was $45,920.61.

Rusch, the Membership Secretary, reported that there are now 532 voting members, 1,037 sustaining members, 404 student members, 129 subscribers, 163 library subscriptions, 16 school subscriptions and 6 church subscriptions. This means a circulation of 2,287.

Moore reported on the sales of the C.R.S. biology books. As of 28 February, 49,594 textbooks have been sold, 2,621 teacher's manuals, 2,365 teacher's lab manuals, and 11,342 student's lab manuals.

Howe reported that the anthology, *Speak to the Earth*, can now be bought at $6.00.

Meyer reported on promotion. Work is still proceeding on brochures, and advertisements. He suggested that we consider whether the term "Position Statement" means the same as "Statement of Belief", and might be better received in the scientific world.

Slusher reported on Student Chapters. A formal application is being made by students at the University of Texas, El Paso. There is interest at Kansas State, University of California at Santa Barbara, and East Texas State. So far, no Faculty Sponsors have been available at these three places.

Williams reported on research sponsored or encouraged by the C.R.S. A summary of the report is given elsewhere in this issue of the *Quarterly*.

Moore reported that several school districts in Indiana have adopted *Biology—A Search for Order in Complexity*. The controversies there, and the statement in The Humanist, Jan.-Feb. 1977, were discussed.

The meeting resumed at 9:00 a.m., 23 April, again with silent prayer. The same members were present.

An amendment to the Constitution, concerning Student Chapters, as printed elsewhere in this issue of the *Quarterly*, was adopted to be presented to the voting members for approval.

It was voted to recognize the Student Chapter at the University of Texas at El Paso, for which the Constitution had been presented. H. Slusher is to be the advisor.

A committee, with Slusher as Chairman, was appointed to deal with future applications for Student Chapters.

The following was added to the Bylaws: Article III Section 6. Officers and members of the Board of Directors shall serve until their successors are elected and qualified.

Meyer was instructed to go ahead with an advertisement in the *Scientific American*. A donation has been received toward it, and additional money, if necessary, voted.

A committee, with Mulfinger as chairman, was appointed to initiate a programme of publication of technical monographs and tutorial works of professional quality, and possibly the reprinting of some creationist classics.

Officers were elected as follows: G. Howe, President; E. Williams, Vice-President; W. Frair, Secretary; W. Rusch, Membership Secretary; R. Korthals, Treasurer.

The persons who are listed elsewhere in this issue of the *Quarterly* were nominated to run for election to the Board of Directors.

A motion was adopted that in future all research projects funded by the C.R.S. will have a principal investigator who is a voting member of the Society.

The theme for the next Annual Issue of the *Quarterly*, June 1978, will be scientific prediction based on the Creation model.