

qualitatively where they may change quantitatively; and it is easier to demonstrate the situation using a discrete boundary.

Suggestions for Further Development

Members may like to pick up the ball at this point to try to develop the following points:

1. What kind of red shift would appear for various stars?
2. What would be the effect of the variation of the speed of light gradually with distance from the Earth?
3. What would be the effect on formulac containing the speed of light as a constant; which ones would change and which ones would not?

Conclusion

I realize that this is just an initial idea, but I feel that this theory could probably be refined by other readers, and I would welcome their expansions or opinions of it. However, this does provide at least one alternative to

the problem raised, without the question arising of God showing us things that never occurred.

Acknowledgments

I should like to acknowledge the help of Mr. Harold Armstrong, M.Sc., in preparing this paper, and of Mr. Mike Leich-Devlin, B.Sc., in giving me the original idea.

References

- ¹Neilson, Lewis, 1977. Certainties, less than certainties, and evolution. *Creation Research Society Quarterly* 14(3):180-182.
- ²See the discussion of the Doppler effect in the part on waves of any elementary work on physics.
- ³Oddly, this last result is just what a relativistic treatment would give. A relativistic treatment of the previous case would give a somewhat different result; but provided v be somewhat less than c the actual difference would be negligible.
- ⁴These matters are considered, under optics, in any elementary work on physics.
- Incidentally, effects of Snell's law might arise in other cases, such as when the Earth and the Sun were inside the boundary, but Jupiter outside it, as considered. However, such points may be left for later consideration.

VARIATION AND FIXITY AMONG LIVING THINGS. A NEW BIOLOGICAL PRINCIPLE

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This article lists the processes of variation which occur among plants and animals, and shows that a true fixity exists in nature at the level of the basic type. The presence of discontinuities between basic types is shown; and a new biological principle is stated: the Principle of Limitation of Variation among Organisms. This principle may be stated as follows: processes of biological variation can go no further than to produce new variants within basic types already in existence.

Variety

One of the delightful things in our natural world is the abundance of objects which challenge our physical senses. In the matter of *number* of living forms alone, taxonomists tell us there are well over one quarter of a million "species" or "kinds" (ignore the distinction for the moment) of plants, and one and one quarter million "kinds" of animals. No wonder we have trouble in our gardens!

There is indeed great variety among the different basic kinds of plants and animals, but in this article I wish to discuss the variation in form and structure which occurs *within the basic types*. By basic types I refer to animals as different as dogs and horses, and to plants as different as roses and sunflowers.

Fixity

The second noun in our title is "fixity" which, as a biological term, comes to us by way of the teachers of theology in the great church-connected universities of Europe. (Which all were, until not long ago.) What was

taught in the area of origins by the theologians in these schools during the eighteenth and nineteenth centuries is made clear by the English historian Sir William Cecil Dampier as follows:

"The emphasis laid by the Protestant Reformation on the verbal inspiration of the Bible led to a more literal interpretation, and by the eighteenth century an acceptance of the details of the story of organic creation, as given in the first chapter of Genesis, became necessary to orthodoxy. In the nineteenth it was apparently believed by almost the whole Christian world."¹

For in the early nineteenth century (in contrast to the situation today, when much scepticism may be found even in schools of theology) most academics (most of whom were then clergy) accepted Genesis quite literally. Many even went beyond the literal reading, it appears, and declared that the expressions in Genesis 1, "after his kind," "after its kind," "after their kind" (See New American Standard Bible), meant that *no variation* could occur within the basic kinds. Furthermore, these theologians apparently taught that the plants and animals had been created in their forms of that day and set on the earth in the very areas where they were found in the 1820's. (It is hard to see how such a belief would

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be reconciled with Genesis 8:17.) Actually the Bible nowhere speaks of “no variation” and “no migration.” This teaching regarding no variation has been called the Doctrine of Extreme Fixity. This was the introduction of the word “fixity” into biological literature. Sometimes this belief was referred to as “the Doctrine of Immutable Species,” i.e., “not capable or susceptible of change.” Nordenskiöld says here, “To Darwin, . . . ‘immutable’ and ‘created’ in regard to species, are inseparable terms.”²

Darwin's Studies

Darwin apparently started on his voyage around the world believing that “no variation and no migration” was the true teaching of Genesis. In the words of Nordenskiöld,

“He (Darwin) was, moreover, in his youth a firm believer in the Christian faith—he intended, in fact, to become a clergyman—and he accepted without criticism the traditional dogmas including, of course, the doctrine of the origin of living species as the result of a divine act of creation. During his voyage, however, he found that this belief conflicted with the results of his observation.”³

Darwin's observations, which revealed both variation within kinds and migration over the earth's surface, placed him in direct confrontation with his understanding of the doctrine about the origins in Genesis. Actually, he seems at that time to have had no desire at all to believe contrary to the common interpretation of Genesis; but with his own eyes he had seen both variation and evidences of migration. This situation worried him very much. This mental struggle is revealed by Darwin in the following extract from a letter written by him to the English botanist J. D. Hooker:

“In 1844 he writes in a letter to his friend the botanist Hooker: ‘I have read heaps of agricultural books and have never ceased collecting facts. At last gleams of light have come, and I am almost convinced (quite contrary to the opinion I started with) that species are not (it is like confessing a murder) immutable.’”⁴

Most unfortunately Darwin appears not to have studied Genesis carefully for himself. He believed (so far as he thought about it) that his teachers had interpreted Genesis correctly; and that his discovery of variation and migration had shown that the Genesis account could not be accepted. Tragically he went on, as have many since Darwin's day, to conclude that he had disproved Genesis when all he had done was to disprove an extreme *interpretation of Genesis*. Those who read Genesis for themselves will find nothing said about no variation and no migration. They *will* find that basic types were created after their kinds (Genesis 1), and that the land animals were to migrate from the ark (whether or no they were created at one place) and “breed abundantly on the earth, and be fruitful and multiply on the earth.” Genesis 8:17 NASB.

But Darwin Went Beyond His Observations

The effect upon Darwin himself of thinking he had disproved the Biblical account of special creation was to cause his imagination to run away with him to the

conclusion that there was no law-bound force in nature—variation, for example, could occur without limitation—or if there were a natural law here it would be one which produced uninterrupted development. In nurturing this idea Darwin found a powerful assist in the geologist Charles Lyell's book, *Principles of Geology*. Regarding the mutual helpfulness of Darwin and Lyell in furthering an idea of a fundamental progressive force in nature, Nordenskiöld says,

“But the main point is that Lyell's theory of geological evolution offered at the time particularly valuable support to the idea of evolution, which was one of the watchwords of the age; here indeed there was confirmation in nature herself of the idea of an uninterrupted development as the fundamental force in existence.”⁵

“Belief in a gradually progressive, law-bound development has always been limited to a few, and these perhaps are to be found among the men of action rather than the men of thoughts and words. The most pronounced faith in progress that has ever existed has been the liberalism of the nineteenth century, a current of ideas which had just reached its zenith by the middle of the century, when the theory of origin came to the fore. The coincidence is of course not accidental; on the contrary, the one idea is dependent on the other, and therefore the victory of Darwinism is inexplicable without some insight into the general intellectual conditions at the time of its birth.”⁶

Darwinism won in the view of the majority, because it assumed and described an attractive fundamental force of continual development, improvement, and progress in nature. Upon an acceptance of this undemonstrated progressive principle in nature the term “fixity” was discarded, except as a collector's item from a past age.

Variation and Fixity

Variation suggests divergence, variance; *fixity* suggests stability. Possibly we should ask, “Can variation and fixity occur in the same population of living organisms? If a population varies how can it be fixed?; if it is fixed how can it vary?” It just may be that the term “fixity” is of great value to us today.

As individual biologists it is very important that we rediscover first if variation *can* occur in the population of a basic type, and second, if it does occur, how far can it go in chemical and corresponding morphological change? It took a voyage around the world to prove to Darwin that variation did occur within basic types. We can know the fact vicariously by a short trip to the library and taking down a few volumes by present-day reputable taxonomists. Here are a few scattering illustrations of what we discover:

1. Hitchcock lists 64 species of bluegrass in the United States.
2. Gray lists 17 species of the common thistle, and 51 species of violets.
3. Sargent catalogs 24 species of willows, 54 species of oaks, and 153 species of the hawthorn or red haw.

4. Hall and Kelson list, for the United States, 66 subspecies of the deer mouse, 66 subspecies of the northern pocket gopher, and 214 subspecies of the southern pocket gopher.
5. Walker lists 12 species of true cattle in the world.
6. Over 30 subspecies of the song sparrow have been listed for the United States.
7. Griffith Taylor names 160 distinct breeds of man on the earth.
8. And who wishes to tell us the number of varieties of dogs, cats, corn, beans, or any other domesticated plant or animal?

Indeed, variation generally *does occur* within basic types. Darwin should receive credit for being among the first to make this delightful fact apparent to the world. Interestingly, there are a few basic types which *do* apparently show extreme fixity—offspring are as like their parents as coins are like the die that stamps them. These include the ginkgo tree, the coelacanth fish, the thistle butterfly, the American eel, some chalcid wasps, the garden weed purselane, and a few more. The factors of their hereditary systems seem to be in so stable a state as to prevent the formation of variants.

But most basic types of organisms do show variation. What produces these variants in the basic types? Here is where the geneticists come in, and they give us the facts for the following Outline of Variation:

Types of Variation

There are two large classes of variation: 1. Non-hereditary (environmental, nongenetic), and 2. Hereditary (genetic).

1. Environmental. Example: an 80-foot Englemann spruce at 9,000 feet elevation in the Rockies, and grotesque dwarf Englemann spruce at timberline (10,000 to 11,000 feet). Environmental variation does not affect the germ line. I.e., if seeds are planted in a new environment, the plants will be according to the new environment, not the old.

2. Hereditary.

(a) Recombinations of genes: Produce throwbacks but nothing basically new. Example: Red-and-white calf born to established black-and-white Holstein cattle line.

(b) Gene mutations (chemical changes in genes at the level of the nucleotides) (1) Visible, (2) Biochemical, (3) Lethal.

(1) Visible. Examples: Short-legged Ancon sheep, albino forms, double flowers, red sunflower, Concord grape, calico corn, bulldog-faced dog, pacing gait in horse.

(2) Biochemical. Causes inability to make a certain essential amino acid or protein.

(3) Lethal. Causes early death if in double recessive (homozygous) combination, or possible living freaks if heterozygous. Example: Creeper fowl in poultry.

(c) Chromosomal aberration (chromosomal mutation): (1) Changes in chromosome number, (2) Changes in chromosome structure.

(1) Changes in chromosome number. Haploidy (single chromosome of each set present), polyploidy (more than two chromosomes present in each set). Examples: Autopolyploidy

(hybridization within one species), and allopolyploidy (hybridization between two species), and heteroploidy (abnormal number of chromosomes in a single set, but not a simple multiple of the haploid number). Example: Variants in Jimson weed.

(2) Changes in chromosome structure.

Deficiency or deletion—loss of one or more genes. Examples: Notched wing in *Drosophila*, waltzing gait in mice.

Duplication—addition of one or more genes in chromosome. Example: In *Drosophila*, roughening of eyes, changes in wing shape, and modified bristles.

Translocation, or segmental interchange—exchange of parts between nonhomologous chromosomes. Example: Produces variants within a basic type.

Inversion, or rotation of a block of genes within a chromosome. Example: New species of *Drosophila*, grasshoppers, and some plants.

Hybridization

Hybridization (referred to in 2(c)(1) above) is probably the single greatest source of new variants. Witness the enormous number of hybrids among our domesticated plants and animals today. If we could only cross two different basic types we would surely get a new basic type. However, all practical and laboratory evidence indicates that if two organisms are sufficiently different morphologically to constitute two different basic types, they *can not hybridize*. To say this the other way around, in every verified instance where cross breeding has occurred the two partners have been sufficiently alike morphologically to belong to the same basic type. There is *no* exception to this principle in natural sexual reproduction.

Basic Types are Fixed

In the above categories we have listed all known ways of producing a new variant. After many years of practical experience and laboratory study of these processes of variation the conclusion is that not one nor all these ways of accomplishing variation have ever produced any basically new organisms. New variants indeed do appear in existing basic types, but *no new basic types* have resulted. By present-day definition microevolution (variation within a basic group) has occurred; but no empirical evidence exists that macroevolution (formation of a new basic type) ever occurred; rather the evidence is against it.

And now we return to the term “fixity.” In harmony with every laboratory finding and common experience, we discover that there *is* a fixity in nature; but that fixity exists, not at the level of, e.g., varieties of dogs, but rather at the level of the *dog kind* (the dog basic type).

Most evolutionists conceive of a hypothetical phylogenetic tree in which all members are genetically related. (A few seem to envisage some separate origins.) This means that if the concept is true one should be able, in the realm of morphology, to follow continuously link by link from any organism to any other organ-

ism. But in nature this *cannot be done*. We discover that every basic type, with its population of more or less variants, is isolated from every other basic type. It is as if each basic type were surrounded by a "wall" which preserves the integrity of the basic type and prevents it from ever forming any new basic type. Variation can do no more than produce a new variant within the "wall" of that basic type. This wall (chemical separation) makes crossing of two basic types impossible. This biological isolation of basic types from one another is called *discontinuity* (see Dobzhansky¹), and this discontinuity between basic types is in every sense a *bridgeless abyss*. The situation is exactly as stated in Genesis: God by separate acts created the discrete kinds of plants and animals.

The Principle of Limitation of Variation

This brings us to the unveiling of a new basic biological principle, a principle as important as that of "Life Only from Life." This principle or natural law may be named and stated as follows: The basic biological principle of *Limitation of Variation*: Processes of biological variation can go no farther than to produce new variants within basic types already in existence.

To my knowledge the only place in biological literature where this principle has been recognized as such is at the bottom of page 105 of my recent book *Variation and Fixity in Nature*.⁸

Why is it that this extremely important, thoroughly demonstrated principle of biology, one which is verified by *every* pertinent laboratory finding, has not been recognized in nature by our modern biologists? How can this happen in modern science where the watchword is "open-minded study"? Help in answering these

questions may be found on page 154 in the English evolutionist physiologist G. A. Kerkut's book, *Implications of Evolution*.⁹ Kerkut warns that extrapolating beyond demonstrable evidence which bears on origins may lead to a blind acceptance of an hypothesis which will close our eyes to yet undiscovered facts. Only a "short step in logic," wishful extrapolation, and great faith (presumption?) in an hypothesis can cause a scientist to ignore the completely demonstrated biological principle of Limitation of Variation.

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²Nordenskiöld, Eric, 1928. The history of biology. Alfred A. Knopp, Inc., New York. P. 466.
³*Ibid.*, p. 463.
⁴*Ibid.*, p. 463.
⁵*Ibid.*, p. 457.
⁶*Ibid.*, p. 458.
⁷Dobzhansky, Theodosius, 1970. Genetics of the evolutionary process. Columbia University Press, New York. Pp. 21 & 22.
⁸Marsh, Frank L., 1976. Variation and fixity in nature. Pacific Press Publishing Association, Mountain View, California. P. 105.
⁹Kerkut, G. A., 1960. Implications of evolution. Pergamon Press, New York. P. 154.
 Editor's Note: Is it possible that the theologians of about 1820 were thinking of fixity of the Genesis kinds, the basic kinds mentioned here; but that they spoke of them as species? For the theologians were likely more familiar with Aristotle's writings than with Linnaeus'; and Aristotle meant by species something like the basic kind. See, e.g., his *Categories*, chapter 5. But those who had studied biology would likely have interpreted the species in a narrower sense. If this suggestion is true, in a real sense the Darwinian dogma arose out of confusion.
 It may be fair to remark that in Darwin's own time, Fleeming Jenkin, for one, expressed the fact that variability is limited, although he did not call the fact a principle, nor use the name proposed here. See Siegler, Hilbert R., 1976. Fleeming Jenkin's critique of Darwin's Origin of Species. *Creation Research Society Quarterly* 13(2):111-114. But he apparently got little hearing.

NEW ORGANIZATION TO UPHOLD BIBLICAL INERRANCY

Word has been received of the formation of an International Council on Biblical Inerrancy. The purpose of the Council is to publish literature, to conduct seminars and conferences, and to take other steps to strengthen and propagate the doctrine of inerrancy.

As an early stage in the work, a summit meeting is planned for October 1978.

More information can be obtained from Dr. J. Grimstead, International Council on Biblical Inerrancy, Post Office Box 13261, Oakland, California 94661.

The Things Which One Can Study!

St. Thomas Aquinas, in his *Prologue to a Sermon on the Creed*, used the following illustration: ". . . if man could know perfectly all things . . . it would be stupid to believe what we do not see. However, our knowledge is so imperfect that no philosopher has ever been able to make a perfect investigation of the nature of one fly. We read that a certain philosopher spent thirty years in solitude, so that he might study the nature of a bee. If our intellect is so feeble, then, is it not stupid to refuse to believe anything about God, other than what man can know by himself?" (This is included in *The Pocket*

Aquinas, ed. Vernon J. Bourke, 1960. Washington Square Press, New York. pp. 385 & 286.

It does not seem to be stated who the philosopher mentioned was. Maybe this remark was intended as a half-humorous illustration.

However, (and this is the point to be made here) is it not surprising how the matter has turned out? For there now are philosophers, natural philosophers, that is, and hundreds, maybe thousands, of them, who devote their time to the study of a fly. Of course, the fly is now called *Drosophila*.