to get at the truth about rocks. Sensing the likely danger that the trickle would grow into a mighty current, the faithful disciples of Frick turned to last-ditch extremes: they announced that anyone who denied the credibility of the *theory in stone* was no scientist at all. Their articles solemnly declared that: "*All serious* rock experts adhere to the theory of Frick"—thus implying that anyone who dared to question the acclaimed theory was incompetent. This included even those who had been thoroughly brainwashed in the halls of Frickdom, but who had later allowed the evidence to change their minds.

However, the winds of free investigation and discussion were bringing some fresh air into even the innermost recesses of Frickdom. Even the most loyal were admitting that the Frickian theory was untenable without serious amendment. So in due time, investigators of rocks, who still called themselves Frickians, were teaching that the gray and the blue rocks had existed together from the beginning. "And," they added," that is what we have really been saying all along"!

PRINCIPLES OF CREATIONISTIC BIOLOGY

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Three principles which can be used as a basis for biological research in a Creationistic framework are discussed.

A great deal of effort has been expended over the past few years in reinterpreting old data and compiling new data in a creationist framework. However, it has been my feeling that this work has been hampered by the lack of well-stated principles on which to base creation science. The consequence of this has been apparent both on the internal and external levels. On the internal level the various papers are sometimes difficult to compile into a unified whole due to a lack of universal principles. On the external level, involving confrontation with evolutionists, it has been difficult to be taken seriously as they reject any Biblical authority and we have not had a set of scientific principles to fall back on.

In this paper I will suggest a set of principles which can form a unified base for research and provide a scientific foundation from which to approach evolutionists.

The General Principle of Creation

The general principle of creation can be stated as follows: Increasing levels of complexity of an organism requires increasing amounts and/or detail of information. This predicts that advancement from colonial grade to tissue grade,[1] for example, would require more genetic information to control the greater physiological complexity. This increase in information should be reflected in an increase in the amount of DNA per cell. Thousands of organisms have had the amount of DNA in their cells determined and an increase has been observed in the amount of DNA per cell as the organismic complexity increases.[2] It should be noted that this increase holds in the invertebrates but not in the vertebrates where frogs and amphiuma[3] have more than two times and twenty six times respectively the DNA of man.[4] Thus, the prediction based on DNA content does not seem to always hold within grades. To an extent this is to be expected as differences between different types of animals within grade may be largely due to regulatory differences. It has been proposed that the highly repetitive sequences of DNA which are not structural genes (satellite DNA or introns) may be involved in this regulation.[5] Whether different types of organisms have widely differing amounts of satellite DNA has not been determined. At any rate why the frog needs so much more DNA than man is unclear.

The general principle of creation also holds for the origin of life and its precursors. Before a nucleotide or amino acid sequence can be put to biological use it must have information impressed upon it. The formation of biologically active proteins from amino acids is an increase in complexity or order in the sense that they are polymers and in that a specific sequence of amino acids is required. To obtain the required sequence requires the input of information. In living cells this information comes ultimately from the DNA which is also constrained to have a specified sequence to serve as a template for a viable protein. With the origin of the first functional DNA (or RNA according to one theory[6]) from a mix of chemicals the need for information input is even more pointed. All nucleotides in a cell are dextrarotatory. No method is known to randomly isolate a pure optically active compound. Information input is required. Even if a DNA of pure optically active nucleotides were formed it would only reflect that information superimposed on it. This is because information is not simply an increase in order but a specified increase in order.[7] This is not to suggest that prebiotic creation proceeded by the paths suggested by the evolutionist with only the addition of directiveness. We can not know the details of this stage of creation any more than can the evolutionist. It does point out that any scheme must include informational input.

The Principle of Limited Variation

The general principle of creation deals with the progression to higher forms of life. As this is a historical event it must by nature be highly theoretical. Creation

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theory also makes predictions about organisms and their relationships in the present. To reflect this two additional principles should be stated. The first is the principle of limited variation, first stated by Dr. F.L. Marsh.[8] This principle states that processes of biological variation can go no farther than to produce new variants within basic types already in existence. Note that this does not rule out the possibility of subspecific speciation as the new species would be of the same class or type as the parent species.

There are generally two sources of variation in organisms. These are environmental and genetic. Environmental variation is due to location, nutrition and in higher organisms possibly training. Examples would be trees above and below the timberline and grass with and without fertilization. Genetic variation is due to new combinations of or changes in the genetic material. Recombination of genes between parents of the same species or variant produce throwbacks but nothing new. Hybridization between different variants does produce new variants. As an example the Himalayan cat is the true-breeding off-spring of the Persian and Siamese cats. Changes in the genetic material include mutation, changes in chromosome number and changes in chromosome structure. Changes in the genetic material are generally harmful but does give rise to some new variants. However, most of these new variants are due to hybridizations that change the number of chromosomes .(autoploidy, alloploidy, and heteroploidy) and not to the formation of new or improved genes by mutation. Invariably hybridization only occurs between closely related organisms, i.e., of the same basic type. This observation is predicted by the principle of limited variation.

The Principle of Conservation of Adaptedness

The final principle to be discussed here is the principle of conservation of adaptedness. This principle states that variation in a population which results in lessened ability to survive or reproduce tends to be eliminated in successive generations. From this principle we would expect two things. First, the offspring of well adapted parents (barring mutations) should also be well adapted because those genes which cause maladaption should have been eliminated from the gene pool in earlier generations. Secondly, mutations of genes or chromosomes should result in a less adapted individual. While generally both of these expectations are observed in nature, many harmful mutations persist in a population for very long periods of time. The persistence of very harmful mutations is because they frequently are masked when in a heterozygous condition and only lethal when homozygous. Consequently the principle must not be applied without consideration of the complete genotype of the organism.[9]

Application of this principle should also keep in mind what it means to be adapted. Unfortunately, this seems to be a concept everyone recognizes but finds difficult to explain. In part this is due to adaptedness being a subjective evaluation essentially based on the ability to survive.[10] This seems to lead to the tautology that adapted organisms survive because they are adapted. However, the reason for the apparent tautology is the false assumption that every term must or can be defined. The fundamental terms of science cannot be defined, they can only be described. This is apparent when you consider that a term is defined by the use of more basic terms. But fundamental terms or concepts are the most basic ones possible. Therefore there are no terms available to define fundamental terms. We may then describe adaptedness as being suited to the environment as measured by the ability to survive.

Most will by now have recognized that the principle of conservation of adaptedness is simply the theory of natural selection and might wonder why it is necessary to state it under a new title. Since natural selection in evolutionary theory is responsible both for the conservation of species and the formation of new species and animal types, it would be a source of confusion to use the same term but retain only a portion of its meaning. To avoid this confusion the use of a new term is better.

These principles will allow two very important things to be done. They provide a common base for the reinterpretation of old data and interpretation of new data in a creationist framework. Secondly, they allow the statement of creation in a positive, scientific way. It is only by taking this step that we can hope to make creation respectable to the scientific and non-scientific communities.

References

[1]Colonial grade refers to those organisms which are multicellular aggregates such as the Volvox. While these animals do have a self-consistent form, the cells are not organized into tissues.

[2]Hinegardner, Ralph, 1976. Evolution of genome size. (In) F.J. Ayala (ed.) Molecular evolution, Sinauer Associates, Inc., Sunderland, Massachusetts. Pp. 179-199.

[3]An apode amphibian, commonly called the Congo eel.

[4]Dobzhansky, Theodosius, 1970, Genetics of the evolutionary process, Columbia University Press, New York. p. 17.

[5]Leninger, Albert, L., 1975. Biochemistry, Worth Publishers, Inc., New York. Pp. 884-885. And Dobzhansky, Theodosius, *et al.*, 1977. Evolution. W. H. Freeman, San Francisco. Pp. 74 & 85-87.

[6]Eigen, Manfred, *et al.*, 1981. The origin of genetic information. Scientific American 244(4):88-118.

[7]Wilder-Smith, A.E., 1981. The natural sciences know nothing of evolution. Master Books, San Diego, California.

[8]Marsh, Frank L., 1978. Variation and fixity among living things. A new biological principle. Creation Research Society Quarterly 15(2):115-118.

[9]One of the classical examples of gene masking is the Mouse t allele. See: *op. cit.*, Dobzhansky *et al.*, Pp. 124 & 506-507.

[10]Smith, John Maynard, 1975. The theory of evolution. Penguin Books, Baltimore, Maryland. Pp. 15-26.

(Editor's note) Readers may be interested in comparing this work with Brown's article, *The First Seven Basic Biological Laws of Creation*, elsewhere in this issue of the *Quarterly*. Both items were prepared about the same time; and I do not doubt that the authors arrived at their ideas independently.