

persons in our day they are either problems or signs of authority. If one assumes that only average occurrences are real, a miracle is a problem; if he believes God rules the world it is a confirmation of his belief in God.

The scientific method is a high ideal, in fact too high for many persons to follow consistently. But since it casts doubt upon single occurrences and insists upon repetition for proof, although this often is impossible, we must recognize values other than science. When a teacher starts a course in science he sometimes states that the course will not involve study of the whole, but only a part, of reality.⁴

The available facts, when observed without prejudice, fit the world view of administration by a personal God rather than the working of cold and immutable laws.

Yet persons who believe in "general evolution"

from molecules to man hold their article of faith above any other world view. This preconceived idea, that living things *had to arise and develop gradually*, is the chief reason people believe in evolution. If certain observed facts do not fit this belief they are held to be accidental and contingent. But if scientists observe facts carefully and without prejudice, then the preferable world view of creation followed by diversity and degeneration may be comprehended.

References

¹Cooper, Lane. Louis Agassiz as a teacher. Comstock Publishing Co., Ithaca, N. Y., p. 48.

²This consensus was reached following the exhaustive experiments of Louis Pasteur of France. Many others, however, had made similar proof. Now there are evolutionists who try to prove the opposite but have not done so.

³Snyder, L.M., and P. R. David 1957. Principles of heredity. Heath, p. 223 f.

⁴The present author has made such a statement.

ARGUMENTS AGAINST SYMMETRY AND DESIGN FROM CHANCE EVENTS

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The theory of evolution, whether in Darwin's original form or in the modern form since the introduction of mutations, amounts, in the final analysis, to saying that the forms of all of the living creatures in the world have come about by chance. The obvious objection is that, in cases in which scientists can follow what is happening, intricate designs do not come about by chance. The author emphasizes this point by reference to the sand paintings made by some tribes of Indians. It might be claimed that, if sand of different colors were mixed and scattered at random, a painting might result. But nobody in his right mind would wait for such a thing to happen. Since living creatures are more intricate than any sand painting, how much less could they have come about by chance?

Introduction

The lesson of the ages is that lasting institutions must be based upon truth; to state the matter negatively, human institutions cannot be based upon lies, misconceptions, ignorance, or superstitions, nor upon only fragments of truth. But the discovery of truth is most difficult: man's senses are limited, memories are weak and deceptive, intellectual powers are frail, the world is vast and enormously complex, and lives are short. Men are often mistaken.

The child has much to learn and little time for learning before he becomes an adult. From a few hasty observations, he makes vast generalizations, which, though they often contain serious errors, yet become habits of thought. He may not find the errors during his lifetime, but still he communicates his generalizations to the generations of the future.

As a result traditional knowledge is a mixture of truth and error, and often it is most difficult to distinguish between the two. Often error is mistaken for truth with disastrous consequences. And while men search for past errors, they sometimes add more errors for the generations of the future to correct.

The present generation has inherited from the past the Darwinian theory of evolution, which appears very convincing when judged superficially, but which may be shown to be hopelessly contradictory in the light of well-established facts and principles.

In this article, I develop an argument based upon sand paintings which shows that designs cannot be produced by chance.

The Origin of Darwinism

Let us consider a bit of history: when he was a young man, Charles Darwin, being greatly impressed by changes in plants and animals which breeders had produced by selection, tried to extend the principle of selection, conceived as a purely mechanical process, as an adequate explanation for the origin of species in natural environments. He had no adequate explanation for the causes of variations in organisms.

Darwin failed to realize that the superior organism must somehow be produced before it can be obtained by selection, whether natural or artificial. His followers recognized this defect in his thinking, and after their discovery of sudden variations, which they called mutations, they claimed that such changes were caused by chance. It did not occur to them that the odds against producing designs by changes at random are so exceedingly great, that evolution, if it exists, cannot be explained in this way.

Why did Darwin try to develop a mechanical theory? Sir Isaac Newton had discovered laws of mechanics; and his followers tried with great success to extend his basic ideas of quantitative descriptions to other things. Reckless generalization gave the idea that the universe is a mechanism, and Darwin, like many others, accepted this.

A scientific theory, of course, should be judged critically, and not according to the education of the

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person who presents it. But in searching for errors and their causes, matters of education are important. Darwin left an autobiography which shows that his education was completed at less than the early age of twenty-three, that he was educated to be a clergyman, and that he had only a smattering of science. He was especially weak in mathematics, and this means that he could not have had a good understanding of the physical science of his time. His education was such that he could not have been a sound critic of his own ideas.

The Argument From Sand Paintings

Let us consider a powerful argument against Darwin's ideas, based upon sand paintings. In some places in the West, sands of various colors are readily available, and some American Indians discovered that they can be used in making beautiful sand paintings, exquisite works of art. Let us consider the use of sands of only two colors, black and white. Experiments will be suggested that can be done cheaply and easily to test in a limited way the theory that chance can be the cause of designs. Even quite young children can do them and grasp their meaning.

In order to have something definite in mind, let us start with 950 cubic centimeters of white sand and 50 cubic centimeters of black sand. These exact amounts are not essential, but they are reasonable amounts with which to work. The size of the grains of sand is not essential, but they should be so small that the eye does not distinguish them as individuals. So let us assume that their size is quite uniform, and that they have an average diameter of one hundredth of a millimeter. The total number of grains according to these assumptions is one million million (1,000,000,000,000).

It is a fact of experience that any shade of gray can be made by mixing black and white pigments. So, if a surface, one meter square is first covered with white sand, then black sand and mixtures of black and white sand can be used to produce a copy of any page of any book in any language or in any handwriting; a copy of any black and white photograph of any person, animal, plant, object, scene, manufactured article, or anything whatsoever that can be photographed; a copy of any engineers' drawings and specifications; or a graph of any mathematical function.

Let us recognize that any language means not only any existing language, which includes the Chinese, but also any past language, which includes ancient Egyptian, and in addition any new language that may be invented; and it even includes the sign language of American Indians. The letters of any written language are geometrical forms, and in theory the number of possible forms is infinite.

In practice, it can be very great, as Chinese children know to their sorrow, for their language involves some 60,000 symbols. The formation of words from letters is arbitrary, and association of words with ideas is also arbitrary. On the basis of these facts, an enormous number of languages is possible.

The same thing is true for different pictures, drawings, and diagrams; their number obviously is enormous. Not only can whole pictures be shown, but also parts of pictures, and small parts of many pictures

mixed up in an enormous number of ways. Disregarding human limitations, an infinite number of distinguishable things can be shown, one after another, or a few at a time.

Let us assume an area one meter square divided into square centimeters by horizontal and vertical lines, and that these small squares are used for writing numbers, reading from left to right and from top to bottom as usual, with one digit per square. In this manner, one could show in black sand all numbers from zero to one less than 10 multiplied by itself 10,000 times, that is, $10^{10,000}$ different numbers.

It is obvious that the number of things that can be shown with black sand far exceeds this enormous number. A far greater number may be shown by using 100 symbols for digits instead of 10, and a 100 as the basis of the system of writing. Moreover this does not include the infinity of pictures and of scrambled parts of pictures.

In man's ordinary affairs, he never uses very large numbers; thus persons do not really comprehend them. It is not difficult to write a number with 10,000 digits, but it is impossible fully to comprehend the meaning of such a number. Sir Arthur Eddington proposed a theory by which he calculated that there are 3.145×10^{79} particles in the entire physical universe.

The mass of the sun is known; and if the sun is composed of protons and electrons, one would have to multiply their number by about ten thousand billion billion to reach Eddington's number. It is not important to the present argument whether or not his theory or his number are correct; in any event the number is vastly greater than the number of atoms of which the earth is composed. It is interesting to notice that if each particle in the universe was a being who had to have a Social Security number, the largest number any being would have to use would contain only eighty digits.

Let us suppose that all of the matter of the entire physical universe were in the form of wood pulp suitable for making paper, and that it were made into an enormous thin flat sheet upon which numbers are written so small that a good magnifier would be needed for anyone to read them. This enormous sheet would obviously be far too small for writing at one time all the numbers from zero to $10^{10,000}$, for this number is vastly greater than Eddington's number. There appears to be no way in which one can show, in intuitive terms, the meaning of this enormous number. But with black sand, a vastly greater number of things than this can be shown.

What Can Be Produced By Chance?

Let us try to depict numbers, pictures, and so on by chance: first mix the white and black sands, and then sift the mixture over the area. To obtain pictures, figures, and so on is merely a matter of having the grains of sand fall into suitable positions. An enormous number of designs are possible. If the sand grains are sifted over and over again, it is theoretically possible by this random procedure to obtain page after page of the whole Encyclopedia Britannica in the exact order that the pages have been printed. But are the pictures, printed pages, and so on sufficiently probable for even one to be obtained?

It is proverbial that it is hard to find a needle in a haystack. If the whole earth was made of white sand with only one black grain, it would be difficult to find the black grain, but not exactly impossible. If all of the waters of the earth contained only one fish, that fish would be difficult to find and catch. Where the possibilities are enormous in number, the probability of finding a particular thing is extremely small.

One's experiences in mixing things and scattering them at random is that only a uniform shade of gray will be obtained by scattering a mixture of white and black sand over a selected area. This illustration from sand paintings shows the great difference in meaning between possible and probable. The pictures, writings, numbers, and drawings are all possible, but it is not practically probable that any one configuration will be obtained by random procedures. Evolutionists have been teaching that almost every possibility might occur in the natural environment during the long period of the earth's existence. The present argument shows that this is not the case: an infinity of things cannot be tried by a finite number of things in finite time.

The reader is familiar with odometers which record the number of miles automobiles are driven. The little wheel on the right records tenths of a mile, the next on the left records miles; then come tens, hundreds, thousands, and ten thousands. It is clearly possible to make a similar device with 10,000 wheels, but it is not possible to make such a device to show the number of all of the different things which may be shown by black and white sands, for this number is infinite.

Symmetry

Let us suppose that an Indian obtains colored sands for making a large painting of the left wing of a beautiful moth, and that a record is kept of the amounts of the various colored sands which he uses. Now let us suppose that the same amounts of each colored sand are mixed, and then someone tries to obtain, by sifting the sands over an area, the symmetrical painting of the right wing of the same butterfly. The probability of obtaining this symmetrical painting by chance is obviously extremely small. But it is not exactly impossible, at least in the sense that the Indian could certainly paint it with the sands before they were mixed.

Let us consider this matter of symmetry in organisms from the mathematical point of view. A painting may be divided into horizontal colored lines, so let us consider that a line is composed of 1,200 grains of sand, using 200 grains of each of six colors. It is a problem in permutations to calculate the number of possible color patterns along this line. Exchanging grains of the same color does not change the pattern. According to calculations, there are about 10^{926} different patterns, a number which is vast in comparison with Eddington's number for the particles in the physical universe.

Thus the odds against producing symmetry by chance are so vast that the numerous symmetries in nature, such as wings, eyes, ears, and hands, constitute far more than enough evidence for the conclusion that

some cause other than chance is acting to produce designs.

What Can Be Accomplished In a Finite Number of Trials?

The fact that infinitely many designs are possible means that it is only infinitesimally probable that any one of them will be discovered in a finite number of trials. The use of numbers might make this clearer. Let us assume a collection of 100 pictures each composed of 5,000 parts in the form of little squares, all of the same size. The parts of a single picture may be identified by writing the same serial number on each part, and using different serial numbers for different pictures. Assume further that the parts for each picture are kept in separate bins.

Random selection of the parts is desired, and for that purpose it is practical to have identical balls numbered from one to 100, and to number the bins similarly. Then place all of the balls in a bag, mix them; and without looking, draw a ball from the bag, and take a part of a picture from a bin of the same number.

Under these conditions, the chance of selecting a part from a particular bin is exactly $1/100$, and therefore from the laws of the mathematical theory of probability, $(1/100)^{5,000}$ is the probability for selecting all of the parts for a picture in 5,000 trials. This is an extremely small number. Instead of obtaining all of the parts for one picture, it is far more probable that some of the parts for all of the pictures would be obtained.

It is not even possible to fit together by chance more than a few things to form designs. In order to illustrate this point, let us assume a picture one meter square which is cut into squares, 10 centimeters each way, making 100 equal squares. It is assumed that these squares will form a picture, without disharmonies, only when they are placed together in the original manner, a condition which is obviously true for many pictures, but not for all. Since there is only one place for each square, they can be arranged without rotation in 100-factorial different ways. This is a vast number, about 10^{158} , which is far greater than Eddington's number.

In the case of the sand grains, the usual result of scattering the sand grains at random is a confusion of an exceedingly great number of possible things: pictures, letters, diagrams, drawings, figures, and small parts of these things are all so confused that no designs are visible. The experiment shows that the number of the arrangements of the sand particles which do not form designs is vast in comparison with the number of possible designs. It may be true that the non-designs form an infinity of higher order than that of designs.

Random Change Does Not Cause Improvement

From practical experience in working with things, one may conclude that almost every change in a good design makes the design worse. No knowledge or skill is required to change most machines so that they cease to operate properly. A baby can easily destroy a watch or camera. On the other hand it is almost always difficult to change good designs to make them

better, and making such improvements requires much knowledge and skill.

The lenses of an excellent microscope can be removed, and they can be rearranged in no great amount of space in infinitely many ways which do not give an image of a small object. It is indeed easy to change a well-written article so that it is worse, but it is difficult to make it better, and this applies also to all works of art.

When changes are made in good designs by accidents, it is practically certain that the designs will be damaged or destroyed. Automobiles are not made better by accidents. Everything that man makes, such as buildings, roads, dams, bridges, houses, clothes, communication systems, and machines becomes more disordered, according to the second law of thermodynamics. The second law of thermodynamics in a most general form, as stated by Lewis and Randall in their text *Thermodynamics* is as follows: "Every system which is left to itself will, on the average, change to a condition of maximum probability." A large amount of evidence in physical science is consistent with this law, and there is no known evidence against it. Since all things man makes are destroyed eventually, they must be considered improbable arrangements of matter at the time when construction is complete.

So Species Cannot Originate By Chance

From the above evidence and discussion, it is evident that Darwin and his followers have been wrong in thinking that any upward trend in organic evolution, if it exists, can be explained by mutations at random, and the survival of the fittest. A search should be made for a different explanation.

Alfred North Whitehead, in his little book, *The Function of Reason*, stated his conclusion that Reason is the cause of the upward trend in evolution. He appears to have been the most competent mathematician among the philosophers of the world. Actually his explanation of the nature of things has a very long history: Anaxagoras, an ancient Greek who lived from an uncertain 500 B.C. to 428 B.C. taught that Reason is the cause of all things.

There Is No Universal Principle of Evolution

It is now certain, moreover, that a universal principle of organic evolution does not exist: in 1938, the coelacanth, a fairly large marine fish, was discovered near Madagascar. Before that important discovery, paleontologists thought that that species had been extinct since the Cretaceous period. The unchanged existence of the coelacanth for a vast period of time is sufficient evidence for the conclusion that there is no universal principle of evolution. Since this is the case, the evolution of a species could be established only by some proof of descent.

The Bad Effects of Philosophical and Scientific Error

Let it be clearly understood that philosophers and scientists, who think and write about the most profound matters, are affecting, for better or worse, the destiny of mankind. Human affairs form a vastly complex system of interlocked elements such that trouble with one thing can cause near and remote troubles with many things. It is necessary to be on constant guard against error.

Darwin was badly prepared to be a philosophical leader of mankind; but he has been listed through mistaken judgment as one of the world's greatest thinkers. He was not a broadly and deeply educated person; he was like a child playing with a loaded machine gun, the mechanism of which and the dangers of which he did not understand. In his autobiography, he stated, "but I was also ambitious to take a fair place among scientific men,—whether more ambitious or less so than most of my fellow-workers, I can form no opinion." In pursuit of his ambition, he tried to destroy, and believed that he had destroyed, the validity of the extremely important theological argument from design; and many people accepted his use of evidence and reasoning as valid.

The mistaken acceptance of his theory of the origin of species caused many people to abandon belief in mankind's greatest thought, that the entire universe with its enormous number of stars and nebulae, with an earth of vast beauty and marvelously constructed organisms forming an intricately interlocked world of life, was created by an Intelligent Being, vastly greater than man.

The Inadequacy of the Materialistic World-View

Progress in lifting the human race to a higher level depends largely upon the discovery of profound truth, such as mathematics including the calculus, combined with quantitative experiments and Newton's laws of motion. On the contrary, one of the worst things that can happen to mankind is mistaking a serious error for profound truth, for this causes mistaken judgments about matters of the greatest importance. Darwin's theory should be considered one of the greatest blunders ever made.

Before Darwin's time for many centuries, it was generally accepted that the universe was composed of mind and matter. The meanings of many of the words used in casual conversation and in formal writing are based upon this philosophy of dualism, but mind and matter are not defined in the philosophy of materialism to which Darwin's theory appeared to give powerful support. The result has been that man has tried to make important decisions according to inconsistent general ideas, and he has brought about a seriously divided world. Thinking men should now recognize that Darwin's theory is erroneous, and start the reconstruction of ideas.