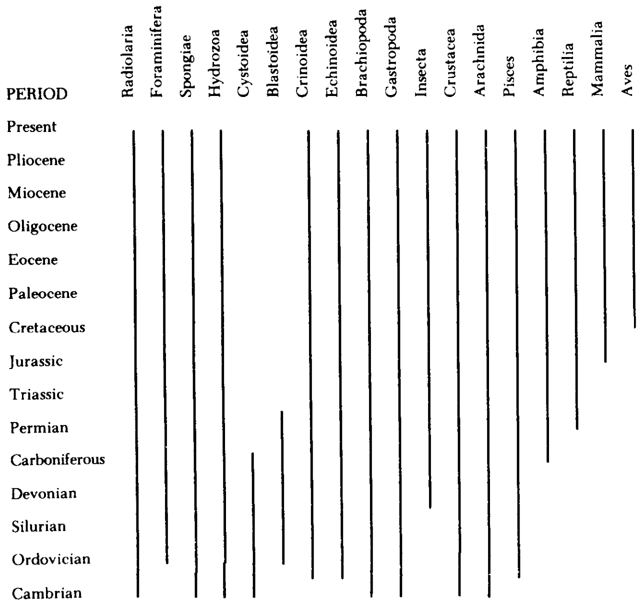

Chart 1. Generalized Geological Record of Animals. Vertical lines represent duration of each animal group. No common ancestors are known. (Based on Harland, W. B., and others, Editors. The fossil record. London: Geological Society, 1967.) (After O'Brien.)

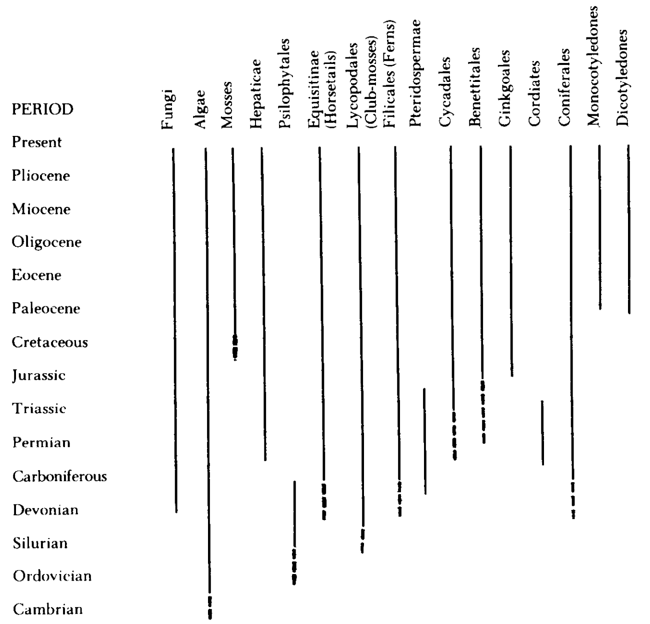

Chart 2. Generalized Geological Record of Plants. Solid vertical lines represent duration of existence of each plant group. Broken line portions indicate some doubts as to earliest appearance of some groups. No common ancestors are known. (Based on Harland, W. B., and others, Editors. The fossil record. London: Geological Society, 1967.)

progenitor; and the same is true of the *sudden* appearance of about 50 families of flowering plants in the so-called Cretaceous division of the accepted geological time scale.

Many summary paragraphs could be included here on the outstanding scientifically documented information about plants and animals in the fossil record. But the important point to make is that knowledge of the content of the above cited book is not recent. Specialists in the proper fields have possessed most of these facts for decades. And proponents of the General Evolution Model, who are familiar with the facts of paleontology, admit existence of gaps between *all* higher categories. They admit that this is an undeniable fact of the fossil record.

FLEEMING JENKIN'S CRITIQUE OF DARWIN'S *ORIGIN OF SPECIES*

HILBERT R. SIEGLER*

Darwin's Origin of Species created a considerable controversy at the time of publication. One scientist who disagreed with Darwin was Fleeming Jenkin. His critique of origin of species through natural selection is here quoted at length, since his arguments have never been adequately refuted.

Using the work of breeders with pigeons, cattle, horses, dogs, and roses, Jenkin pointed out how through selective breeding the different species of plants and animals will at first demonstrate considerable variability. The rate of variation in a given direction, however, is a constantly dimishing rate, tending to a limit. Darwin attempted to bypass this weakness in his theory by resorting to vast lapses of time. Jenkin insisted that if man through careful manipulation was unable to overcome this natural tendency of species to reach a limit beyond which they show variability, time, no matter how vast, would be equally ineffective.

Modern day geneticists have to date not provided the evolutionists with a sound refutation to the objections raised by Jenkin. Even the allopatric theory, i.e., the theory that evolution occurred among small isolated groups, fails to do this.

The original publication of *Origin of Species* incited many debates in the scientific world, both pro and con Darwin's theory. Some of the most cogent scientific objections to the theory were recently reviewed by Hull.[1] While some scientists raised objections to the theory which were later disclaimed by their contemporaries, several critics pointed out fallacies in the theory of natural selection which I believe have never been satisfactorily refuted. One such critic was Fleeming Jenkin.[2]

Henry Charles Fleeming Jenkin (1833-1885) was a professor of engineering at Glasgow. He was also an inventor, with 35 British patents in his name. In 1865 he was elected a fellow to the Royal Society of London,

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and in 1869 to the Royal Society of Edinburgh, becoming vice-president in 1879. His review of Darwin's theory will be quoted at some length, since many of his comments seem as pertinent today as they were when originally presented.

Darwin later acknowledged that he had modified some of his opinions substantially after reading Jenkin. After reviewing Jenkin's arguments I believe Darwin's modifications should have been considerably more substantial.

Variability.—Darwin's theory requires that there shall be no limit to the possible difference between descendants and their progenitors, or, at least, that if there be limits, they shall be at so great a distance as to comprehend the utmost differences between any known forms of life. The variability required, if not infinite, is indefinite. Experience with domestic animals and cultivated plants shows that great variability exists. Darwin calls special attention to the differences between the various fancy pigeons, which, he says, are descended from one stock; between various breeds of cattle and horses, and some other domestic animals. He states that these differences are greater than those which induce some naturalists to class many specimens as distinct species. These differences are infinitely small as compared with the range required by his theory, but he assumes that by accumulation of successive differences any degree of variation may be produced; he says little in proof of the possibility of such an accumulation, seeming rather to take for granted that if Sir John Sebright could with pigeons produce in six years a certain head and beak of say half the bulk possessed by the original stock, then in twelve years this bulk could be reduced to a quarter, in twenty-four to an eighth, and so further. Darwin probably never believed or intended to teach so extravagant a proposition, yet by substituting a few myriads of years for that poor period of six years, we obtain a proposition fundamental in his theory. That theory rests on the assumption that natural selection can do slowly what man's selection does quickly; it is by showing how much man can do, that Darwin hopes to prove how much can be done without him. But if man's selection cannot double, treble, quadruple, centuple, any special divergence from a parent stock, why should we imagine that natural selection should have that power? When we have granted that the 'struggle for life' might produce the pouter or the fantail, or any divergence man can produce, we need not feel one whit the more disposed to grant that it can produce divergences beyond man's power. The difference between six years and six myriads, blinding by a confused sense of immensity, leads men to say hastily that if six or sixty years can make a pouter out of a common pigeon, six myriads may change a pigeon to something like a thrush; but this seems no more accurate than to conclude that because we observe that a cannon-ball has traversed a mile in a minute, therefore in an hour it will be sixty miles off, and in the course of ages that it will reach the fixed stars. This really might be the conclusion drawn by a savage seeing a cannon-ball shot off by a power the nature of which was wholly unknown to him, . . . Even so do the myriads of years confuse our speculations, and seem to remove natural selection from man's selection; yet, Darwin would be the first to allow, that the same laws probably or possibly govern the variation, whether the selection be slow or rapid. If the intelligent savage were told, that though the cannon-ball started very fast, it went slower and slower every instant, he would probably conclude that it would not reach the stars, but presently come to rest like his stone and arrow. Let us examine whether there be not a true analogy between this case and the variation of domestic animals.

We all believe that a breeder, starting business with a considerable stock of average horses, could, by selection, in a very few generations, obtain horses able to run much faster than any of their sires or dams; in time perhaps he would obtain descendants running twice as fast as their ancestors, and possibly equal to our race-horses. But would not the differences in speed between each successive generation be less and less? Hundreds of skillfull men are yearly breeding thousands of racers. Wealth and honor await the man who can breed one horse to run one part in five thousand faster than his fellows. As a matter of experience have our racers improved in speed by one part in a thousand during the last twenty generations? Could we not double the speed of a cart-horse in twenty generations? Here is the analogy with our cannon-ball; the rate of variation in a given direction is not constant, is not erratic; it is a constantly diminishing rate, tending therefore to a limit.

It may be urged that the limit in the above case in not fixed by the laws of variation but by the laws of matter; that bone and sinew cannot make a beast of the racer size and build go faster. This would be an objection rather to the form than to the essence of the argument. The existence of a limit, as proved by the gradual cessation of improvement, is the point which we aim at establishing. Possibly in every case the limit depends on some physical difficulty, sometimes apparent, more often concealed; moreover, no one can *a priori* calculate what bone and sinew may be capable of doing, or how far they can be improved; but it is unnecessary further to combat this objection, for whatever be the peculiarity aimed at by fancy-breeders, the same fact recurs. Small terriers are valuable, and the limit below which a terrier of good shape would be worth its weight in silver, perhaps in gold, is nearly as well fixed as the possible speed of a race-horse. The points of all prize cattle, of all prize flowers, indicate limits. A rose called 'Senateur Vaisse' weighs 300 grains, a wild rose weighs 30 grains. A gardener, with a good stock of wild roses, would soon raise seedlings with flowers of double, treble, the weight of his first briar flowers. He or his grandson would very slowly approach the 'Cloth of Gold' or 'Senateur Vaisse', and if the gradual rate of increase in weight were systematically noted, it would point with mathematical accuracy to the weight which could not be surpassed.

We are thus led to believe that whatever new point in the variable beast, bird or flower, be chosen as desirable by a fancier, this point can be rapidly approached at first, but that the rate of approach quickly diminshes, tending to a limit never to be attained. Darwin says that our oldest cultivated plants still yield new varieties. Granted; but the new variations are not successive variations in one direction. Horses could be produced with very long or with very short ears, very long or short hair, with large or small hooves, with peculiar color, eyes, teeth, perhaps. In short, whatever variation we perceive of ordinary occurrence might by selection be carried to an extravagant excess. If a large annual prize were offered for any of these novel peculiarities, probably the variation in the first few years would be remarkable, but in twenty years' time the judges would be much puzzled to which breeder the prize should fall, and the maximum excellence would be known and expressed in figures, so that an eighth of an inch more *or* less would determine success or failure.

A given plant or animal appears to be contained, as it were, within a sphere of variation; one individual lies near one portion of the surface, another individual, of the same species, near another part of the surface; the average animal at the center. Any individual may produce descendants varying in any direction, but is more likely to produce descendants varying towards the center of the sphere, and the variations in that direction will be greater in amount than the variations towards the surface. Thus, a set of racers of equal merit indiscriminately breeding will produce more colts and foals of inferior than of superior speed, and the falling off of the degenerate will be greater than the improvement of the select. A set of Clydesdale prize horses would produce more colts and foals of inferior than superior strength. More seedlings of 'Senateur Vaisse' will be inferior to him in size and color than superior. The tendency to revert, admitted by Darwin, is generalized in the simile of the sphere here suggested. On the other hand, Darwin insists very sufficiently on the rapidity with which new peculiarities are produced; and this rapidity is quite essential to the argument now urged as subsequent slowness.

We hope this argument is now plain. However slow the rate of variation might be, even though it were only one part in a thousand per twenty or two thousand generations, yet if it were constant or erratic we might believe that, in untold time, it would lead to untold distance; but if in every case we find that deviation from an average individual can be rapidly effected at first, and that the rate of deviation steadily diminishes till it reaches an almost imperceptible amount, then we are as much entitled to assume a limit to the possible deviation as we are to the progress of a cannon-ball from a knowledge of the law of diminution in its speed. This limit to the variation of species seems to be established for all cases of man's selection. What argument does Darwin offer showing that the law of variation will be different when the variation occurs slowly, not rapidly? The law may be different, but is there any experimental ground for believing that it is different? Darwin says (p. 153), 'The struggle between natural selection, on the one hand, and the tendency to reversion and variability on the other hand, will in the course of time cease and that the most abnormally developed organs may be made constant, I can see no reason to doubt.' But what reason have we to believe this? Darwin says the variability will disappear by the continued rejection of the individuals tending to revert to a former condition; but is there any experimental ground for believing that the variability will disappear; and, secondly, if the variety can become fixed, that it will in time become ready to vary still more in the original direction, passing that limit which we think has just been shown to exist in the case of man's selection? It is peculiarly difficult to see how natural selection could reject individuals having a tendency to produce offspring reverting to an original stock. The tendency to offspring more like their superior parents then their inferior grandfathers can surely be of no advantage to any individual in the struggle for life. On the contrary, most individuals would be benefited by producing imperfect offspring, competing with them at a disadvantage; thus it would appear that natural selection, if it select anything, must select the most perfect individuals, having a tendency to produce the fewest and least perfect competitors; but it may be urged that though the tendency to produce good offspring is injurious to the parents, the improved offspring would live and receive by inheritance the fatal tendency of producing in their turn parricidal descendants. Yet this is contending that in the struggle for life natural selection can gradually endow a race with a quality injurious to every individual which possesses it. It really seems certain that natural selection cannot tend to obliterate the tendency to revert; but the theory advanced appears rather to be that, if owing to some other qualities a race is maintained for a very long time different from the average or original race (near the surface of our sphere), then it will in time spontaneously lose the tendency to relapse, and acquire a tendency to vary outside the sphere. What is to produce this change? Time simply, apparently. The race is to be kept constant, to all appearance, for a very long while, but some subtle change due to time is to take place; so that, of two individuals just alike in every feature, but one born a few thousand years after the other, the first shall tend to produce relapsing offspring, the second shall not. This seems rather like the idea that keeping a bar of iron hot or cold for a very long time would leave it permanently hot or cold at the end of the period when the heating or cooling agent was withdrawn. This strikes us as absurd now, but Bacon believed it possibly true. So many things may happen in a very long time, that time comes to be looked on as an agent capable of doing great and unknown things. Natural selection, as we contend, could hardly select an individual because it bred true. Man does. He chooses for sires those horses which he sees not only run fast themselves, but produce fine foals. He never gets rid of the tendency to revert. Darwin says species of pigeons have bred true for centuries. Does he believe that it would not be easier by selection to diminish the peculiarities of the pouter pigeon than to increase them? And what does this mean, but that the tendency to revert exists? It is possible that by man's selection this tendency may be diminished as any other quality may be somewhat increased or diminished, but, like all other qualities, this seems rapidly to approach a limit which there is no obvious reason to suppose 'time' will alter.

But not only do we require for Darwin's theory that time shall first permanently fix the variety near the outside of the assumed sphere of variation, we require that it shall give the power of varying beyond that sphere. It may be urged that man's rapid selection does away with this power; that if each little improvement were allowed to take root during a few hundred generations, there would be no symptom of a decrease of the rate of variation, no symptom that a limit was approached. If this be so, breeders of race-horses and prize flowers had better change their tactics; instead of selecting the fastest colts and finest flowers to start with, they ought to begin with very ordinary beasts and species. They should select the descendants which might be rather better in the first generation, and then should carefully abstain from all attempts at improvement for twenty, thirty, or one hundred generations. Then they might take a little step forward, and in this way, in time, they or their children's children would obtain breeds far surpassing those produced by their overhasty competitors, who would be brought to a stand by limits which would never be felt or perceived by the followers of the maxim, *Festina lente*. If we are told that the time during which a breeder or his descendants could afford to wait bears no proportion to the time used by natural selection, we may answer that we do not expect the enormous variability supposed to be given by natural selection, but that we do expect to observe some step in that direction, to find that by carefully approaching our limit by slow degrees, that limit would be removed a little further off. Does any one think this would be the case?

There is indeed one view upon which it would seem natural to believe that the tendency to revert may diminish. If the peculiarities of an animal's structure are simply determined by inheritance, and not by any law of growth, and if the child is more likely to resemble its father than its grandfather, its grandfather than its great-grandfather, etc., then the chances that an animal will revert to the likeness of an ancestor a thousand generations back will be slender. This is perhaps Darwin's view. It depends on the assumption that there is no typical or average animal, no sphere of variation, with center and limits, and cannot be made use of to prove that assumption. The opposing view is that of a race maintained by a continual force in an abnormal condition, and returning to that condition so soon as the force is removed; returning not suddenly, but by similar steps with those by which it first left the average state, restrained by the tendency to resemble its immediate progenitors. *A priori*, perhaps one view is as probable as the other; or in other words, as we are ignorant of the reason why atoms fashion themselves into bears and squirrels, one fancy is as likely to meet with approval as another. Experiments conducted in a limited time, point as already said to a limit, with a tendency to revert. And while admitting that the tendency to revert may be diminished though not extinguished, we are unaware of any reason for supposing that pouters, after a thousand generations of true breeding, have acquired a fresh power of doubling their crops, or that the oldest breed of Arabs are likely to produce 'sports' vastly surpassing their ancestors in speed. Experiments conducted during the longest time at our disposal show no probability of surpassing the limits of the sphere of variation, and why should we concede that a simple extension of time will reverse the rule?

The argument may be thus resumed.

Although many domestic animals and plants are highly variable, there appears to be a limit to their variation in any one direction. This limit is shown by the fact that new points are at first rapidly gained, but afterwards more slowly, while finally no further perceptible change can be effected. Great, therefore, as the variability is, we are not free to assume that successive variations of the same kind can be accumulated. There is no experimental reason for believing that the limit would be removed to a greater distance, or passed, simply because it was approached by very slow degrees, instead of by more rapid steps. There is no reason to believe that a fresh variability is acquired by long selection of one form; on the contrary, we know that with the oldest breeds it is easier to bring about a diminution than an increase in the points of excellence. The sphere of variation is a simile embodying this view;—each point of the sphere corresponding to a different individual of the same race, the center to the average animal, the surface to the limit in various directions. The individual near the center may have offspring varying in all directions with nearly equal rapidity. A variety near the surface may be made to approach it still nearer, but has a greater tendency to vary in every other direction. The sphere may be conceived as large for some species and small for others.

Modern day geneticists have not, as yet, provided the evolutionist with a sound refutation to the objections raised by Jenkin over 100 years ago.

Today, most biologists subscribe to the "allopatric theory" popularized by Ernst Mayr,[3] to account for the rise of new species. Nevertheless, Jenkin's objections seem equally valid when applied to the idea that new species arise where very small populations become isolated from parental groups.

Despite all claims and efforts to the contrary, no biologist since Darwin's time has been able to develop a valid case for macro-evolution. As contended by Siegler,[4] the Creator placed in each "kind" a tremendous potential for change and the production of varieties, always, however, ***within*** the limits of each "kind" or baramin.

Postscript by the Editors: Subsequent research has shown that Jenkin was quite right in his conclusions. In France, for instance, about 1800, ordinary sugar beets tested about six per cent sugar; and were the best available at the time. By 1878 through breeding and selection the content of sugar had been raised to 17 per cent. But 40 years later it was reported that there had been no further increase in the amount of sugar content, even though the same type of selection had been continued. When one beet contains all the genes (to use an explanation which was not available to Jenkin) for high sugar content, there is nothing more which can be accomplished by selection methods directed by man.

Another example is hybrid corn. Inbred strains are built up by selection and two strains, or perhaps four strains, are crossed to get the hybrid corn for seed. If the growers desire further improvement they do not attempt the futile task of improving a given hybrid; rather they go back to open pollinated corn and breed a new hybrid.

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