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## What about Organic Evolution?

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### ON SNAKES SWALLOWING THEIR YOUNG

"One day as we came trooping out of school at noon, the snake raised its head several inches, uttered a hissing sound, and then lowered its head an inch or so from the ground and opened its mouth quite widely. All eyes were on the snake, when from around the corner of the house and from further away in the yard, came a number of small snakes which rushed pell-mell into the open mouth of the mother—the first little snakes to enter the mouth would almost instantly turn around and stick their little heads out and thrust out their little forked tongues as defiantly as you please. Often there would be three or four heads sticking out at one time, and considerable signs of a rumpus going on inside her body a few inches back from the head."

The foregoing is from the pen of Dr. E. D. Ball, former State Entomologist, writing in the Proceedings of the Iowa Academy of Science for 1915. He is writing here of a large and "motherly" common garter snake whose unique behavior he witnessed while attending a rural school in Iowa. The actions of the snake here described took place not once, according to Ball, but as often as he and the rest trooped out to witness the feat. He adds, also, that he has seen the same thing several times since, although under less favorable conditions.

Do snakes actually swallow their young to protect them and later spew them out again as Dr. Ball states further in his article? Well, I have never seen them do this, and I do not know of any other student of snakes who has. Ditmars, Curator of Reptiles at the New York Zoological Gardens, has never seen anything of this kind, and he daily observes more snakes than the average man does in a lifetime.

But if they do not actually swallow their young, how can we account for stories like the one quoted above? Dr. Ball obviously believes what he is telling even though the story has its imperfections. It may be pointed out, for example, that garter snakes do not hiss, and that even for the moment granting this power, it would require a considerable hiss,

amidst the clamor of the school children, to tell all the little snakes "around the corner" and "further out in the yard" that they were expected to come running into the maw of their 'Ma.'

When garter-snakes are first born they are about the size of ordinary earthworms, say five or six inches long and the diameter of a soda-straw, and anyone who has ever watched even a good-sized garter snake swallowing an earthworm can well see the difficulty that the little snakes would encounter in thus seeking sanctuary in the depths of their mother. The earthworm, in fact, slippery as it is, is not actually swallowed, but rather "chewed" down, and one may well surmise that this would be a slow and painful procedure to the young snakes.

Some snakes, the common king snake for example, are cannibalistic in habit, and may often be seen devouring other snakes which they have killed by squeezing between their powerful coils. A casual observer seeing this swallowing act in its last stages might easily believe that the snake was swallowing its own young. Some snakes also produce living young and if shortly before the birth of its young a snake were smashed badly, the wriggling young thus prematurely freed might again lend some support to the idea of "snake swallowing." Both of these considerations may have something to do with the origin of the superstition, for such I believe it to be.

Roy L. Abbott

### WHAT ABOUT ORGANIC EVOLUTION?

One of the great generalizations of science is the theory of organic evolution. It is, however, very commonly misunderstood by the average person. To many, thanks to such deluded individuals as the late William Jennings Bryan, it is a very dangerous doctrine and any one who believes in it is an atheist and must reject the teachings of the Bible. I have had college students ask this question. Is it possible for one to believe in evolution and be a Christian? This question arises only from one who has misconceptions as to the real meaning of evolution and

perhaps also as to the true meaning of religion.

What are some of these misconceptions?

1. **The misconception that evolution means that man is the direct descendent of an ape.** This is all the theory means to many. It is a spectacular interpretation, hence more interesting. This interpretation is not true and even if it were it would be only one minor part of a great generalization. No biologist believes that our present species of apes were the ancestors of man or that the future descendants of living apes will be men. The theory does maintain that our present species of apes and man had a common ancestor, but this ancestor was neither ape nor man. The ape line and the human line separated back a few million years ago.

2. **The misconception that evolution and Darwinism are synonymous.** Darwinism means to the biologist not evolution but the "theory of natural selection." This is Darwin's theory to explain the causes and factors of evolution. While natural selection is generally recognized as one of the important factors in organic evolution, yet there are points in the theory as stated by Darwin that are criticized by authoritative biologists. This misconception has led many uninformed critics to state that many biologists no longer accept the theory of evolution. When Darwinism is criticized by a biologist it is not organic evolution but natural selection that is being criticized.

3. **The misconception that evolution is contrary to religion.** There is no conflict between religion and evolution. Organic evolution is a question of biology and not of religion. The question as to the validity of the theory can never be answered by communing with a God, but only by the study of plants and animals. No open-minded, intelligent man can study critically the living organisms of this world and the fossil records of the rocks without becoming convinced that an evolutionary conception of life is much more reasonable than a conception that species are fixed. All biologists are evolutionists and they constitute the authority on biological subjects.

When one has trouble with his automobile, he consults an automobile expert. When one desires an authoritative answer on evolution, he should consult an authority on the biology of plants and animals. Our modern ministers who have some training in science accept the doctrine of evolution and find no conflict with their religion. Likewise great scientists, such as Millikan, Conklin, Osborn, and others, are firm believers in religion.

The theologians in the past have been very jealous of any attempt that science has made to explain natural phenomena. Even Newton aroused the ire of certain theologians when he stated that gravity causes bodies to fall. They objected because they said that God was the cause and any other explanation is heresy and detracted from the omnipotence of God. This happened in the Middle Ages, yet in spite of our supposed enlightened civilization today, we are chagrined to find the same sort of a mediaeval argument being advanced against organic evolution, and we find the state of Tennessee setting aside a law of nature by legislation. One is reminded of the legislator who introduced a bill to change the ratio of the circumference of a circle to its diameter from 3.1416 to 3. It seems as if we are not yet out of the "Dark Ages."

So far I have discussed only what evolution is not. What is it then? We live in a dynamic universe and not a static one. Change is the natural order of things. The astronomer studies the heavens and tells us of the evolution of planets, suns, stellar systems, and nebulae. We see the surface of the earth undergoing change due to natural forces at work. Language, literature, religion, everything is changing. Is it surprising then that the biologist recognizes this same great principle of change at work in the living world? Organic evolution is the term applied to those changes that have and are taking place in plants and animals by which our present forms have come into existence from earlier and usually more simple forms. If you believe that plants and animals can be changed by selection and breeding, you believe in evolution. When any one really understands what science means by

evolution, it ceases to be that terrible ogre that he first thought it was.

Just what is the status of organic evolution today? Since this is a question of science, we should turn to the scientists for an authoritative answer. In 1925, the Council of the American Association for the Advancement of Science passed resolutions concerning this question. This organization is the greatest organization of scientists in America consisting of some 20,000 members. The following are extracts quoted from these resolutions.

"The Council affirms that so far as the scientific evidences of evolution of plants and animals and man are concerned, there is no ground whatever for the assertion that these evidences constitute a "mere guess." No scientific generalization is more strongly supported by thoroughly tested evidences than that of organic evolution."

"The Council affirms that evidences in favor of the evolution of man are sufficient to convince every scientist of note in the world and that these evidences are increasing in number and importance every year."

High school teachers are often confronted with the problem of whether to teach organic evolution in their biology classes. There certainly is need for education along this line, but in some communities the subject must be handled with much tact. The important thing to do is to teach the facts of the living world with this dynamic viewpoint. If this conception is put across, you are teaching evolution. A pupil cannot study the variation in white oak leaves without getting a lesson in evolution. He cannot observe the breeds of dogs or the varieties of corn without learning of evolution. If possible, the subject should be presented as evolution and I think it can be done by a tactful teacher in most communities. The teacher should teach it simply as a part of biology and not set himself up as a reformer to change his community.

There is need in the Middle West for educating people as to the true meaning of organic evolution and this will have to come largely from our biology instruction. But it must be done with tact and common sense.

C. W. Lantz

## CURRENT INDUCTION

In the last number of the Science Bulletin we discussed Faraday's two experiments in current induction. It is interesting to recall at this time that September 21 of this year a centennial celebration of Faraday's discovery was held in Queen's Hall, London. Sir William Bragg, a renowned English physicist, gave the address on this occasion. This address was broadcast generally in America, being transmitted across the ocean by radio.

An exhibition was also opened on September 23 in Albert Hall, London, at which reproductions and illustrations of Faraday's history making experiments were displayed. There were also many exhibits of commercial electrical appliances founded on Faraday's discoveries and manufactured by the great industries of today. General Smuts of South Africa delivered the address on the occasion of the opening of these exhibits.

President Frank B. Jewett of the Bell Telephone Laboratories and Vice President of the American Telephone and Telegraph Company extended felicitations via trans-Atlantic radio telephone and loud speakers to those gathered in Albert Hall, London. We are pleased to quote the following from President Jewett's address:

"Although I have formal authorization to speak only for my confreres in the United States, I feel quite safe in assuming in a degree to be the spokesman for men of science of whatever nationality. As such, I say to you of Britain that, although Faraday was of your blood, we of other lands yield you nothing on the measure of the respect and admiration in which we hold him. Go where you will in our institutions of learning, in the stately edifices we raise as homes for our scientific societies, or in the more prosaic housing of our scientific industrial establishments and you will find always the evidence of our regard. For us he is ever a great simple man who enriched the world as few others have been privileged to enrich it."

"In a way there is something peculiarly fitting in this tribute which I bring you and in the manner of its delivery. Involved in it is probably more of the fruit of all Faraday's