FEATURE: A Life-Saving Scientific Discovery – Ernst Chain

PROF.: An accident that saved lives, led to a Nobel Prize.

VOICE: Yet one Nobel winner says some other parts of his life and of nature are not accidents. We'll explain.

FORMAT: THEME AND ANNOUNCEMENT

VOICE: Scottish bacteriologist Sir Alexander Fleming [al-eks-AND-er FLEM-ing] knew some substances could kill bacteria. He had discovered that one bacteria-killer was a protein that is found in tears and mucus.

PROF.: But his chief discovery began by accident. When he was appointed professor of bacteriology at the school where he had been a medical student, he left a culture of staphylococcus germs uncovered for several days. He was ready to discard the dish containing the culture, when he noticed that some specks of mold had fallen into it. He observed that, for a short distance around every speck of mold, ***many bacteria had died and no new growth had invaded the area!***

VOICE: Fleming isolated the mold and eventually identified it as one closely related to the variety of mold often found growing on stale bread. Fleming reasoned that the mold contained some compound that inhibited the growth of bacteria. He called the substance penicillin [pen-uh-SIL-un].

PROF.: Nine years later, German biochemist Ernst Chain read Fleming's paper and discussed it with his colleague Howard Florey.

Chain analyzed the structure of penicillin and successfully isolated the active substance by freeze-drying a broth that he had extracted from the mold. His original research required 500 liters of broth to produce enough penicillin for one tablet. Chain is now widely regarded as one of the major founders of the entire field of antibiotics.

VOICE: Fleming, Chain and Howard Florey [FLOR-ee] shared the Nobel Prize in Physiology or Medicine in 1945 for “the discovery of penicillin and its curative effect in various infectious diseases.” Their discovery, and other antibiotics based on it, have saved millions of lives.

PROF.: The Nobel website points out that Chain also researched the metabolism of tumors, investigated how to neutralize snake venoms, and developed methods of biochemical analysis.

VOICE: The magazine *Acts & Facts* contains a biographical article about Chain. It's written by Dr. Jerry Bergman and entitled “Ernst Chain: Antibiotics Pioneer.”

PROF.: Dr. Bergman points out in his article, "One of Chain's lifelong professional concerns was the validity of Darwin's theory of evolution, which he concluded was 'a very feeble attempt' to explain the origin of species based on assumptions so flimsy…that 'it could hardly be called a theory.'"

VOICE: Did you say a Nobel scientist said Darwin's theory was based on such weak assumptions, that "it could hardly be called a theory"?

PROF.: Yes. Chain called macro-evolution a "mechanistic concept" that was "a typical product of the naïve 19th-century." He explained that many scientists give evolution credit for the origin and development of all living species, animals, plants and micro-organisms. But he called evolution "the haphazard blind interplay of the forces of nature and the pursuance of one aim only, namely, that for the living systems to survive…" He said scientists who believe that are mistaken, misled by the 19th-century attitude that science had unlimited potential. That attitude "spread the belief that there were no secrets of nature which could not be solved by the scientific approach, given only sufficient time."

VOICE: Why did Dr. Chain think macro-evolution hadn't really occurred?

PROF.: He explained, "These classic evolutionary theories are a gross oversimplification of an immensely complex and intricate mass of facts, and it amazes me that they were swallowed so uncritically and readily, and for such a long time, by so many scientists without a murmur of protest."

He added that the idea that biological development and survival of the fittest was "entirely a consequence of chance mutations" was a "hypothesis based on no evidence and irreconcilable with the facts." He called it "wild speculation."

VOICE: So Nobel laureate Ernst Chain thought evolution on the macro scale was a wild speculation. He called it "a gross oversimplification of an immensely complex and intricate mass of facts."

PROF.: Yes. His oldest son, Benjamin, added that his father "disliked theories... especially when they assumed the form of dogma…"

VOICE: …A rigid teaching that allows no disagreement or discussion.

PROF.: He also felt that evolution was not really a part of science. Most parts of evolutionary theory can't be tested by experiment.

Another reason he did not consider evolution a scientific theory was that the problem was not the survival of the fittest but the ***arrival of the fittest***.

VOICE: "The arrival of the fittest" would include an understanding of how any life originated – from the simplest one-celled life forms to the highest animals and man.

PROF.: Right. He reasoned that there could be no "struggle for existence" until various species had come into existence. Then they could begin fighting to see which ones would survive.

VOICE: How much variety did he think mutations really do produce?

PROF.: He wrote, "There is no doubt that such variants do arise in nature and that their emergence can and does make some limited contribution towards the evolution of species. The open question is the…extent and significance of this contribution."

Another time he said that evolution "willfully neglects the principle of…purpose which stares the biologist in the face wherever he looks, whether he be engaged in the study of different organs in one organism, …or whether he studies the interrelation and interactions of various species."

In particular, Dr. Chain noted our modern knowledge of the genetic code and its function in transmitting genetic information. He said it seems quite incompatible with classical Darwinian ideas of evolution.

VOICE: I've read opinions that a belief in evolution has led people to behave more cruelly and less morally.

PROF.: Dr. Chain agreed. In a speech in London he said, "It is easy to draw analogies between the behavior of apes and man, and draw conclusions from the behavior of birds and fishes on human ethical behavior. But...this fact does not allow the development of ethical guidelines for human behavior. All attempts to do this...suffer from the failure to take into account the all-important fact of man's capability to think and to be able to control his passions. [These attempts] are therefore doomed to failure."

VOICE: In fact, I've heard some people say "survival of the fittest" means that a person has to "kill or be killed."

PROF.: Yes. That viewpoint has given many people an excuse to do some very unselfish things to anyone that they considered a rival.

VOICE: Some scientists say that religious beliefs do not deserve to be talked about – that science is the only reality. What did Dr. Chain think about that?

PROF.: He wrote, "This seems to me a very sweeping and dogmatic conclusion." He knew that scientific theories can be proven wrong and replaced with new theories. He said they can be "turned upside down by the discovery of one single new fact... This has happened time and again even in the exactest[1] of sciences, [which are] physics and astronomy. It applies even more so to the biological field, where the concepts and theories are…much more liable to be overthrown at a moment's notice."

VOICE: When my atheistic friends hear statements like that, they dismiss them by saying that the person who spoke on must have a religious prejudice.

PROF.: If that is ever true, it's not true in Dr. Chain's case. His son discovered that his father's concerns about evolution were based on science. Chain was very concerned about how Darwinism affected human behavior. He wrote, "Any speculation and conclusions pertaining to human behavior drawn on the basis of Darwinian evolutionary theories...must be treated with the greatest caution and reserve... A less discriminating section of the public may enjoy reading about comparisons between the behavior of apes and man. But this approach…does not really lead us very far."

VOICE: What did he mean?

PROF.: He explained, "Apes, after all, …have not produced great prophets, philosophers, mathematicians, writers, poets, composers, painters and scientists. They are not inspired by the divine spark which manifests itself so evidently in the spiritual creation of man and which differentiates man from animals."

VOICE: So he would disagree with the author who called humans "naked apes" – apes that had lost their hair and gained a few new abilities.

PROF.: Definitely! Dr. Chain made it very clear that he believed God had created mankind, and that God had given instructions on how to live in harmony with other humans. Chain wrote that scientists "looking for ultimate guidance in questions of moral responsibility" would do well to "turn…to the fundamental and lasting values of the code of ethical behavior forming part of the divine message which man was uniquely privileged to receive through the intermediation of a few chosen individuals."

VOICE: Was he talking about the Bible?

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1 The most exact.

PROF.: Yes. Dr. Bergman concludes his article by saying, "There are few scientists, if any, who have made a greater contribution to human welfare than Sir Ernst Chain. His work founded the field of antibiotics, which has saved the lives of multi-millions of persons. Chain is only one of many modern scientists who have concluded that modern neo-Darwinism is not only scientifically bankrupt, but also harmful to society."

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Sources:

Nobel website, http://nobelprize.org
Isaac Asimov, *Asimov's Biographical Encyclopedia of Science & Technology.*
Jerry Bergman, "Ernst Chain: Antibiotics Pioneer," *Acts & Facts* magazine, April 2008.