# SCIENCE NEWS

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## THE MEANING OF EVOLUTION

"THE meaning of evolution is probably more misunderstood than any doctrine of science. The misunderstanding has arisen from ignorance of the subject, from misinterpretation of the statements of scientific men, and from what may be called a medieval attitude of mind. It has been a shock to educators to realize that there still remains such a mass of untrained minds that can be imposed upon by eloquent ignorance."

With these sentences Professor John M. Coulter, of the Boyce Thompson Institute, Yonkers, N. Y., and formerly head of the botany department at the University of Chicago, opened his lecture March 31, at the New York Botanical Garden.

Opponents of evolution who state that the doctrine has been cast aside by scientists are either self-deceived or deliberately deceiving others according to Professor Coulter. What is being cast aside is not the idea of evolution itself, but many of the formerly accepted explanations of how it came about. Evolution becomes more firmly entrenched every day in the minds of scientists as new facts continue to accumulate, but while these new facts make the probability of the evolutionary process ever stronger, they are themselves so many and present such complicated problems that the question of how evolution happens becomes ever more difficult to answer.

The teaching that acquired characters can sometimes be inherited, long denied, is now beginning to find friends again, Professor Coulter stated. This doctrine of evolution was advanced by Lamarck, long before Darwin's time, but seemed to have been shoved aside by Darwin's alternative doctrine of constant, small, spontaneous variations acted upon by the process of natural selection. The force of natural selection is still admitted, at least in part, but the usefulness of small variations has been called in question by many biologists.

The mutation theory of DeVries, which substitutes sudden origins of new forms at a single leap for the slow variations conceived by Darwin, is still widely accepted, but doubts have been thrown on its validity in many instances, and even its own author has accepted some cases of apparent mutations as being due to the sorting out of hybrid characters.

Yet in spite of all doubts and questions as to method, the fact of evolution remains unshaken, the speaker declared. With evolution, the living world is a single unified picture; without it, creation is chaos, and no single fact has any necessary relation to any other fact.

In conclusion, Professor Coulter cited the great practical value which the study of evolution has had in its applications to the bread-and-butter problem of agriculture.

The statement was made that during the ten years preceding the great war our population had increased twenty per cent. and our food production about one per cent. It was certainly an alarming outlook. Under these circumstances plant crops began to be studied from the standpoint of genetics, and plant breeding became a science.

The lack of crop production arose chiefly from three causes, namely, lack of adaptation of crops to environment, destruction by drought, and destruction by disease. The same races of plants were being cultivated everywhere, and only in certain places was the maximum result obtained. A study of races of crop plants throughout the world, and of the environment necessary for maximum yield, resulted in such an adjustment of crops to conditions that total food production was enormously increased.

The problem of drought is being rapidly solved by the discovery or development of drought resistant races, not only insuring against loss from this cause, but also enormously increasing the possible area of cultivation.

The problem of disease has been attacked in the same way, and disease resistant races of most of the important crops have been developed, much reducing loss from this source.

As a result, food production is now beginning to overtake population, and we may thank the persistent study of evolution for the result.

## ANCIENT MAN IN AMERICA

DR. ALEŠ HRDLIČKA, of the U. S. National Museum, expresses serious doubt as to the high antiquity of the hupresses serious doubt as to the high antiquity of the human inhabitation of America, in spite of such evidence as the recent finding of arrow-heads and human bones in Florida, apparently associated with the remains of animals that lived during the Ice Age.

Dr. Hrdlička is not as inclined to place great emphasis on finding human and animal remains in the same strata as are the paleontologists, or scientists who study ancient animal life. Except for accidental introductions, man alone, among all the forms of animate existence, has the custom of burying his dead; and this must often have introduced his bones, and the tools placed with them as funeral gifts, into strata containing the remains of animals that died many thousands of years earlier. And it is not always possible, he says, to tell whether or not the overlying earth has been dug out and then shoveled back in.

Another point is that, because an animal is extinct, it is not necessarily ancient; it may have lived up to a few thousands of years ago and been a contemporary of the earlier American man, without thereby making the latter very ancient.

A further difficulty, from the anthropologists' point of view, is that so very few of these supposedly ancient human remains and implements have been found in America, as contrasted with the literally millions of flints, bones and similar objects showing human handiwork, together with scores of human skulls and skeletons that have been found in the old Stone Age caves and

sites of Europe. Although experienced anthropologists have been working for many years among the cliff and cave dwellings in the Southwest and elsewhere, they have not found underlying these comparatively recent structures a single implement or a bone of either human being or animal that would indicate the presence of a paleolithic race on this continent.

Another weighty point advanced by Dr. Hrdlička is that the European deposits show a more or less orderly evolution of human skill, from the earliest rough-chipped flints to the perfected stone implements that just preceded the use of metals, whereas the American finds, even those associated with the bones of extinct animals, are all of culturally far advanced types. But the same is true of all the American skeletal remains of man claimed to be ancient—they are all of modern types. This would mean that while man was developing both culturally and in bodily characteristics from the earliest to modern forms in Europe, here in America he started at the top and made no progress at all. And Dr. Hrdlička considers this highly improbable.

## AVIATION HAZARDS

FLYING is becoming safer. Aviation accidents, in proportion to the mileage flown throughout the whole United States, are diminishing, according to statistics compiled by Dr. Frederick L. Hoffman, consulting statistician of the Prudential Life Insurance Company.

During the year 1926, there were 160 fatal accidents in air operations, including pilots, mechanics, passengers and others. Five of these were women, one a negress, a professional aviatrix. The number was probably somewhat less during 1927, while the air mileage during the year increased considerably.

It is estimated that in 1927 there were about 1,500 licensed pilots, among whom there occurred 11 fatalities, a rate of about 7 per 1,000. Even if the rate were 10 per 1,000 it could not be considered excessive considering the novelty of flying over new air routes and the rapid growth of the industry.

Dr. Hoffman is making a comprehensive survey of aviation hazards in this country and abroad to determine among other things what percentage of aviators die, and what constitute the primary factors in aviation accidents. In the course of his investigations, statistics of military, mail and commercial aviation have been consulted, while personal flights have been made to the extent of over 10,000 air miles in this country, Canada and Europe.

The Imperial Airways of London during the three years ending with 1927 carried about 52,000 passengers without a fatality. The air mileage flown was not quite 2,500,000 and, as stated, without a single death to mar the record. By the way of contrast Dr. Hoffman pointed out that in 1842, according to the London *Times*, the number of passengers carried on the eight railway lines of the United Kingdom numbered 10,000, while the distance traveled was 3,500,000 miles. The number of passengers killed that year was 22. Yet air transportation has vastly greater difficulties to contend with.

This summer Dr. Hoffman expects to fly from Boston to the Pacific Coast and return by the southwestern route, giving special attention to airports, radio reporting, plane and engine performance, comfort, safety and medical examination of pilots. The trip will extend over about 6,000 miles of established airways.

## A STATISTICAL SURVEY OF THE INCIDENCE OF CANCER

"IF, in some manner or other, malignant tumors of the alimentary tract and of the reproductive organs could be prevented, cancer would retire at once to a relatively unimportant place among the causes of death."

This statement was made by Dr. Raymond Pearl, director of the Institute of Biological Research of the Johns Hopkins University, after the completion of a statistical survey, made by himself and Miss Agnes Latimer Bacon, on necropsies performed on fatal cancer cases in the Johns Hopkins Hospital.

In summarizing the results of the survey, a report of which will appear in a forthcoming issue of the *Archives of Pathology*, he stated that in men malignant tumors occurred more frequently than anywhere else in the organs of digestion, such as the stomach, intestines, gall bladder and liver. In the women the cancers were found in the reproductive organs. These conditions are in general agreement with the cancer figures of the U. S. Census Bureau.

"The greatest discrepancy between the general population and the necropsy statistics is in respect cancer of the skin," added Dr. Pearl. "Patients with cancer of the skin die at home rather than in a hospital relatively more frequently than do patients with cancer of any other organ system. This fact means that such cases tend to the under-represented in necropsy statistics. The patient who enters a hospital with cancer of the skin in an early stage is discharged cured. But for the patient who lets his cancer of the skin go without treatment, or with the supposedly palliative treatment of quackery, until it is destined shortly to be fatal, a hospital has little to offer."

From these studies it appears that more of the different organ systems of the body are susceptible to cancer in white people than in colored. On the other hand, a relatively larger proportion of the cancers of colored people occur in the digestive system and in the reproductive system than is the case in whites. The average age at death of people with tumors that had produced secondary growths or metastases, as they are known to medicine, was found to be from one to three years earlier than in cancer cases without such secondary growths.

## HAY FEVER

THE spring hay-fever season is officially started. Maple and elm trees, oaks, hickories, and walnuts have announced the open season for sneezing by broadcasting their pollen on the April air. And in return the first faint hay-fever sneezes have promptly been set off.

Spring hay fever, caused by the pollen from trees, is less likely to be recognized than the summer hay-fever due to weeds and grasses, according to Dr. Harry S. Bernton, associate professor of preventive medicine of the Georgetown University Medical School. Many people who start sneezing about this time of year attribute their symptoms to colds due to the fickle changes of spring weather.

Hope for some of the baffling cases of hay fever due to grass pollen is held out this year by Dr. Bernton, through new analyses of the pollen grains. It has been customary to find out the kind of pollen that irritates the nasal tissues of each hay-fever victim, and then to treat the patient with injections of that particular pollen extract until he becomes immune. Recently by analyzing the pollen, it has been found that a person may be sensitive to one substance in a grain of pollen and not to the rest of the material packed in the tiny grain. Some cases that have stubbornly resisted treatment are due entirely to a sensitiveness to the albumen fraction in the pollen. Albumen makes up only about one ninth of the extractable protein in the pollen grain. So when these patients were treated with pollen extract they did not get big enough doses of albumen to help them. This year, Dr. Bernton is reinforcing the extract of albumen to see if these puzzling patients can be rendered sneeze-proof.

Foresighted sufferers from summer hay-fever are now having the usual pollen injections to render their noses invulnerable by the time the summer pollens get on the air. The newer method of having injections twice a month throughout the year, instead of taking a steady series of treatments before each hay-fever season, is slowly gaining favor. This method seems to produce a more permanent immunity to the disease, but the average hay-fever sufferer likes to forget his sensitive nose entirely in the months when he can breathe freely.

## THE USE OF GOAT SERUM TO PREVENT MEASLES

WHEN measles broke out in the children's ward of the Cook County Hospital, Dr. Louis J. Halpern, resident physician, undertook to stem the disease with goat serum first developed by Dr. Ruth Tunnicliff, of the John McCormick Institute for Infectious Diseases of Chicago.

This serum is produced by immunizing goats by means of cultures of a coccus which Dr. Tunnicliff believes to be the causative germ of measles. It has been used on a previous occasion to prevent measles but only with a small number of cases.

Fifty children, ranging in age from a few weeks to twelve years old, who had never had measles before were treated with the serum, said Dr. Halpern in a report to the American Medical Association. Five of the young patients were ruled out of the series by death from the diseases from which they were suffering when admitted to the hospital. None of these, however, developed measles or showed any signs of serum sickness.

Of the remaining 45, 28, or 63 per cent. were successfully protected, while 17 developed the disease, but the majority of these experienced it only in an attenuated form. None of the children suffered from the after complications that make measles a severe menace to very young children.

As a result of this experience, it seems evident that goat serum gives efficient protection in a large number of cases and offers the advantage of being more readily available than human convalescent serum, which has seen considerable application for the same purpose, since it can be produced in quantities to meet all necessary demands.

## ITEMS

"ASTRONAUTICS" is the latest name to be introduced for a branch of science. It has recently been adopted by the French Astronomical Society to indicate the problems of voyaging through space to other heavenly bodies. To encourage development of this new "science" the society has been given funds for an annual prize of 5,000 francs (about $200) to be awarded in 1928, 1929 and 1930 to the "author of the best original work capable of bringing a realization of one of the numerous scientific desiderata tending to the final goal of astronautics," namely, of actually traveling from the earth to another celestial body. The funds for the prize have been donated by Robert Esnault-Pelterie and André Hirsch, and is known as the Rep-Hirsch prize. It is under the control of a committee of leading French astronomers and physicists, including General Ferrie, former president of the society and head of the telegraphic system of the French army; Professor Jean Perrin, Nobel prize winner in physics; Professor Charles Fabry, director of the Optical Institute; Professor Henri Deslandres, director of the Paris Observatory, and others.

AN example of evolutionary effects in a breed of domestic poultry originally noticed by Darwin, the white-faced Spanish fowl, has gone on evolving rapidly under the guidance of artificial selection, according to a British student of poultry, F. Finn, who writes in *Nature*. When Darwin knew the breed, Mr. Finn states, its face and the sides of its head were covered with white skin, and its earlobes were prominent and pendulous. This white skin has developed even more extensively during the half-century since Darwin called attention to the birds, and the earlobes have vanished as such, having been merged in a sort of horizontal delap that hangs across the cock's throat.

A PLANT that generates gas which can be lighted with a match is described in the British scientific journal, *Nature*, by Dr. W. A. Hamor, assistant director of the Mellon Institute of Industrial Research, of Pittsburgh. The plant is known botanically as *Dictamnus albus*, and in common speech as dittany; it grows in southern Europe and central Asia. It is covered with glands that secrete a volatile oil, which in hot weather apparently evaporates, making the air about the plant inflammable.