

## ANTHROPOLOGY

# Study of Human Behavior May Shape Man's Future Course

Retiring President of A.A.A.S. Says Scientists Must Seek Those Varieties of Behavior Common to All Humanity

**T**HE FUTURE course of mankind on earth may be shaped by the work anthropological science is now endeavoring to do, Prof. Franz Boas of Columbia University said in his address as retiring president of the American Association for the Advancement of Science.

Stressing the fact that many lines of human behavior that appear to be based on human nature are really not universal at all, but are merely characteristics of some specific culture, Professor Boas said:

"It is our task to discover among all the varieties of human behavior those that are common to all humanity. By a study of the universality and variety of cultures, anthropology may help us to shape the future course of mankind."

The anthropologist, studying man, works with history in its broadest sense, Professor Boas pointed out. His problem is to understand the steps by which man has become what he is, biologically, psychologically, and culturally. Only by tracing the course of man's development can science reach any conclusions as to conditions controlling the general history of culture.

The complexity of human cultures was emphasized by Professor Boas. Biologists, he said, are liable to insist on a relation between bodily build and culture. Geographers try to show that human culture derives from its geographical environment. Economists believe that economic conditions control the forms of culture.

While all these factors are important in shaping culture, Professor Boas declared that "every attempt to deduce cultural forms from a single cause is doomed to failure, for the various expressions of culture are closely interrelated and one cannot be altered without having an effect upon all the others."

Little hope that science will ever be able to reduce the data of anthropology to a formula for routine application was held out by Professor Boas.

"The material of anthropology is

such," he said, "that it needs must be a historical science, one of the sciences the interest of which centers in the attempt to understand the individual phenomenon rather than in the establishment of general laws which, on account of the complexity of the material will be necessarily vague, and, we might almost say, so self-evident that they are of little help to a real understanding."

*Science News Letter, December 31, 1932*

## METEOROLOGY

## June Temperatures Predict Chances for Corn Frost

**C**ORN FARMERS in Iowa can now tell, within a few weeks after they have their crop planted, whether or not

## ENDOCRINOLOGY

# Warts on Toad's Head Produce Human Glandular Secretion

**E**PINEPHRINE, a powerfully stimulating hormone secreted by the suprarenal glands of human beings and other higher vertebrates, is produced also by the big "warts" on the sides of a toad's head, which are really glands. Five species are known to produce it in this way, and one of them, a big tropical American toad, may produce more than three times the amount of epinephrine that can be found in a pair of human suprarenal glands.

This was one of the facts about toad gland secretions that were presented before the American Association for the Advancement of Science by a research team consisting of two Chinese and one American: K. K. Chen, A. L. Chen and H. Jensen. The work was done at Eli Lilly and Company research laboratories, Indianapolis, and at the Johns Hopkins University.

Another secretion produced by toad glands is cholesterol, mixed with er-

gosterol. This was found in six toad species. Ergosterol, irradiated with ultraviolet, is vitamin D, the preventive of rickets. The three scientists found that their toad cholesterol-ergosterol mixture, so irradiated, was potent against rickets.

A group of definitely poisonous principles, the bufagins, is also found in toad venom. It has an (*Turn Page*)

it is likely to suffer frost damage in the fall. At the meeting of the American Meteorological Society, Charles D. Reed, of the U. S. Weather Bureau, stationed in Des Moines, told of his studies correlating June temperatures with crop records in the great corn state.

When June mean temperature has been two degrees or more above the average of 69.4 degrees, 95 per cent. or more of the corn has escaped frost damage. This generalization has held good for every one of the twelve cases studied during 43 years of record.

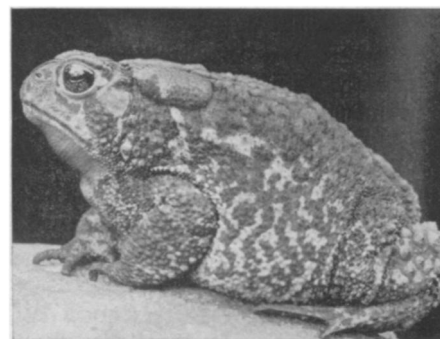
When June mean temperature has been normal, 69.4 degrees or higher, corn not frosted has been more than the 43-year average of 87.3 per cent. This has held good 95 per cent. of the time. Except in 1923, when only 75 per cent. of the corn escaped frost, 90 per cent. or more escaped in each of the 22 years recorded.

All the outstanding frost damage came in years when the June temperature was below 67 degrees. The worst of five bad years on record, 1924, had a crop only 33 per cent. of which was not frosted; the least evil, 1912, showed a 66 per cent. escape from frost injury.

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EPINEPHRINE FROM HIS WARTS

action similar to that of digitalis, powerfully stimulating the heart, and in more than the smallest doses producing serious consequence. Bufagin gets its name from *Bufo*, which is the zoological title of a large and widely distributed genus of toads. Two other groups of poisonous principles are known as bufotoxins and bufotenines.

The three researchers do not believe that the toad makes any practical use of its powerful chemical armament. They stated:

"The toad may be handled, irritated, or stimulated by electricity, but it will not squirt the poison. It is not likely the toad uses its poison for defensive purposes. It is more probable that the secretion is a form of useless product much like strychnine and brucine in the plant *Nux vomica*. The stimulation of the glandular nerves does not result in an increase of epinephrine output into the vein, so that this hormone does not seem to circulate in the blood and play the same role as in higher mammals."

*Science News Letter, December 31, 1932*

## SEISMOLOGY

## United States Feels Year's Most Severe Quake

**T**HE MOST SEVERE earthquake within the United States in a year that was felt in California and Nevada late Tuesday night, Dec. 20, was centered near Mono Lake in the high Sierras not far from the California-Nevada state line. This determination was made by the U. S. Coast and Geodetic Survey using seismological reports gathered telegraphically by Science Service.

The exact epicenter was computed as 38 degrees north latitude and 118.8 degrees west longitude. The time was 10:10 p.m., Pacific Standard Time.

Not since the Texas earthquake of Aug. 16, 1931, which centered around Valentine, Texas, has so severe a shock been felt in this country. It was also reminiscent of the Montana quake of 1925.

An earthquake disturbed the bottom of the sea of the coast of Guatemala early on the morning of Monday, Dec. 19, the U. S. Coast and Geodetic Survey determined from data gathered by Science Service from five American observatories. The exact time of origin was 1:28.5 a. m., Eastern Standard Time. The epicenter was located approximately in 12.5 degrees north latitude, 93 degrees west longitude.

*Science News Letter, December 31, 1932*

## BACTERIOLOGY

# Scientists Discover How Tuberculosis Germs Multiply

## TB Bacteria Are Found to Go Through Several Stages Instead of Following Accepted Method of Splitting in Half

**T**HE EXACT WAY in which a single tuberculosis germ multiplies into three or more new germs has been observed by Prof. Morton C. Kahn of Cornell Medical College, New York City. He described the process before the meeting of the American Association for the Advancement of Science.

Bacteria or germs have a life cycle something like the egg, the pupa and the butterfly. Professor Kahn was the first to work out that cycle for the tubercle bacillus.

The question of how disease-producing bacteria reproduce, or multiply into more bacteria, is one of the most important problems confronting present-day bacteriologists, he said. Some believe that the organisms multiply by simply splitting themselves in half. This is probably the method of a wide variety, but he found it was not the method of the tuberculosis germ.

The rod-shaped tuberculosis germ cleaved into three or more oval bodies which became further reduced in size to extremely fine granules. From these tiny granules very small and delicate rod-shaped types developed. These rods finally elongated and thickened until they became the same size and shape as the tubercle bacillus from which they started. These new, rod-shaped tuberculosis germs were able to produce typical tuberculosis in guinea pigs.

### One Germ Per Drop

In his investigation, Professor Kahn used a length of sterile glass tubing drawn to an inside diameter of about 1/10,000 of an inch. This he filled with culture fluid containing living tubercle bacilli. Tiny drops, about 1/1,000 of an inch in diameter, were then isolated under the microscope. With proper methods, these drops will contain only one tubercle bacillus or germ. The whole thing was then sealed up airtight and Professor Kahn could watch the same tubercle bacillus under the microscope day after day.

Contrary to the claims of some investigators, Professor Kahn did not find

that the tubercle bacillus, even in the form of the almost sub-visible granules, could pass through fine-pored filters. He did find that some of the fine young granules and rods formed from the original tubercle bacillus lost the family characteristic of retaining certain aniline stains even after exposure to acid. This discovery is significant because this characteristic of "acid-fastness" is ordinarily used to determine, for diagnosis, whether or not specimens of sputum contain any tuberculosis germs.

### Smooth to Rough

A single tuberculosis germ, he found further, can carry certain other important family characteristics. One of these is the ability of colonies of tens of thousands of individual tuberculosis germs to change from a type that is smooth, moist and glistening in appearance to a type that is dry, rough and irregular. With this ability to change from one type to another according to appearance goes the ability to have diminished or enhanced power of producing disease. These important characteristics of colonies, Professor Kahn found, belong to individual members of the colonies also.

*Science News Letter, December 31, 1932*

## From ATLANTIC CITY

News of discoveries reported to the great Christmas meeting of the American Association for the Advancement of Science and affiliated societies in Atlantic City is contained in this issue. Activities of the scientists during the second half of the week will be covered in SCIENCE NEWS LETTER for January 7.