

## BACTERIOLOGY

# Germs From Sleeping Sickness Change Form Like Butterflies

**T**HAT A METAMORPHOSIS or change in form similar to that of butterflies is part of the regular life cycle of certain germs, is suggested by the work of Miss Alice C. Evans, senior bacteriologist of the U. S. Public Health Service, who has investigated germs cultivated from cases of encephalitis.

This disease is sometimes called sleeping sickness because extreme drowsiness and lethargy are characteristic symptoms. Germs belonging to the family of streptococci have been recovered from these cases. These are small round germs, well-known to bacteriologists, and the cause of many diseases. They cannot pass through the pores of fine filters. Investigating these germs, Miss Evans was astonished to find them change into the long narrow germ known to bacteriologists as rods. Also, she found that sometimes these germs were able to pass through her fine-pored filters.

## Thought They Knew

A few years ago, bacteriologists were certain they knew all about the lives and habits of the well-known germ families, like the streptococci. Some germs might be round and some straight, some reproduced by dividing or splitting and some by growing spores. But they all remained true to type all their lives, and did not change forms like butterflies and many other living creatures that spend part of their life cycle in one form and part in another.

In fact, bacteriologists were so sure of the stability of germ families that when they saw a rod-shaped germ growing in a family of round ones, they concluded that the rod was a contaminating organism that had gotten into the colony by mistake. For the most part they are right about this, but Miss Evans' studies led her to suggest that bacteriologists may for years have been seeing the rod-forms of round streptococci and mistaking them for contaminating organisms of another family.

## Waver From Form to Form

The germs exist in the body either in the filterable form or in several different forms of bacteria, Miss Evans thinks. It is only with difficulty that the

germs living in the body can adjust themselves to growing on artificial material outside the body. For the first few days after they have been transferred from the body to the artificial growth material, they waver from one form to another. But once they are established on ordinary culture material, one form or the other grows and multiplies indefinitely without variation.

The rod-shaped form of the germ that Miss Evans investigated was more virulent in animals than the familiar coccus form. However, she could not conclude that one or the other form was the cause of the disease in humans.

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## PHYSICS

## Cosmic Ray Work Sped By Recording Electroscopes

**W**ITHIN four months Dr. Robert A. Millikan hopes to determine whether latitude affects in small degree the intensity of the ray and exactly to what extent its effects vary with altitude at higher levels than those at which accurate measurements have thus far been made.

## PUBLIC HEALTH

# College Students Found to Have Three Colds Per Year

**E**ACH COLLEGE student averages three colds a year. Members of families living at home, however, average only about half a cold a year, or one every two years.

The figures are from a study of the incidence and time distribution of common colds just published by the U. S. Public Health Service. The study was made by Dr. Wade H. Frost of the Johns Hopkins School of Hygiene and Public Health and Mary Gover, associate statistician of the U. S. Public Health Service.

The higher incidence of colds in college students might be due to conditions

Dr. Millikan is now making cosmic ray observations in the northern part of the United States after having made a scientific journey to northern Manitoba where airplanes of the Royal Canadian Air Force carried his electroscopes to altitudes of over 20,000 feet.

Dr. Millikan and his associate, Dr. Victor Neher, had previously made observations at Lake Arrowhead, 5200 feet high and some 65 miles east of the California Institute of Technology, of which Dr. Millikan is chairman of the executive council. They used both the older style of cosmic ray electroscope and the newer self-recording electroscope, designed by both scientists and built by Dr. Neher.

In ten years of research on cosmic radiation, Dr. Millikan has made observations in various parts of the world, both in the Arctic and at the equator; but he relies more on the observations made at Lake Arrowhead, at Pasadena, at Churchill, Manitoba, and at Pikes Peak than at his other observation posts. It is especially at Arrowhead that he has developed his technique of lake measurements, for Arrowhead is a body of water free from radioactive constituents and holds few minerals in solution, since its waters are derived from melted snow in the nearby mountains.

In making the observations, Drs. Millikan and Neher take their electroscopes and attendant apparatus, all weighing 900 pounds, out in small boats seven or eight hundred feet from shore in water 200 or (Turn to page 200)

of student life, or might be due to more accurate reporting on the part of the students.

Both at home and at college there were more colds in the period from September to March than in the April to September period. The latter half of July and the first half of August was the period in which there were fewest colds. The attack rates in the different student groups, which were scattered all over the country, were remarkably uniform, showing no consistent relation to latitude, longitude or climate.

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