

The ease with which the infection was picked up in the laboratory plus the fact that the infection occurs naturally in ticks suggests that there may have been other human cases. The disease is very similar to if not the same as the "Q" fever of Australia. The fact that

two such similar diseases exist at points so geographically far apart leads health authorities to believe that other cases must be occurring in both countries and probably in many countries between here and Australia.

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## DENTISTRY

## Tooth Decay Remedy Made By Sulfanilamide Discoverer

### "Zephiran" May Prevent Caries by Stopping Production Of Lactic Acid; Is Powerful Germ Killer and Cleanser

**A**CHEMICAL weapon against tooth decay that may prove as effective as sulfanilamide is against streptococcus infections was announced by Drs. Benjamin F. Miller, Sigmund Bradel and John A. Muntz, of the Zoller Memorial Dental Clinic of the University of Chicago, in a paper presented before the meeting of the American Association for the Advancement of Science in Columbus.

The new anti-caries chemical, called Zephiran, was made by the man who gave sulfanilamide to the world and who was awarded the 1939 Nobel Prize for this achievement, Prof. Gerhard Domagk, of the I. G. Farbenindustrie in Germany.

Long-term studies of Zephiran on patients suffering from dental caries are now under way, following the promising results of laboratory experiments with it, the Chicago scientists stated.

When it was swabbed on the teeth of patients in preliminary trials, it stopped lactic acid production after two minutes of swabbing, and prevented any increase in general acidity. Since lactic acid in high concentration can destroy tooth enamel and thus give decay a chance to start, Zephiran promises to be a potent weapon against tooth decay.

Zephiran was tried after the Chicago scientists had found that two other chemicals, sodium fluoride and iodoacetate, markedly reduced the amount of experimental caries or tooth decay in rats. These two chemicals, it was believed, checked decay by interfering with enzyme processes involved in the growth or metabolism of bacteria associated with the decay process. Fluorine in drinking water, cause of the ugly mottled enamel condition of teeth, had previously been found by other investigators to play a role in caries prevention.

Search for a better and less poisonous

substance than sodium fluoride or iodoacetate to use on human patients led to the trials of Zephiran. This substance is, in chemical terms, alkyl dimethyl benzyl ammonium chloride. It is a powerful germ-killer. In addition, it acts as a cleansing agent, is relatively harmless to mucous membranes such as line the inside of the mouth, and it lowers the surface tension of water. This last property is important because it means the chemical is a good wetting and penetrating agent and can get into effective contact with the dense mass of germs in the dental plaque. Dental plaques are deposits on the teeth of material supposed to act as a medium for the lodgment of germs associated with the decay process.

Zephiran-swabbed and unswabbed plaques were removed from patients' mouths and studied in the preliminary trials. It was in these trials that the inhibition of lactic acid formation was discovered.

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### Diabetics Miss Toothaches

**D**IABETIC children in general are spared the nagging pain of toothaches and the discomfort of having cavities in their teeth filled, it appears from a report by Dr. George Stein, of the Harvard Dental School.

A group of 82 patients who had acquired diabetes during childhood gave Dr. Stein the information he reported. Examination of these patients showed that caries, or tooth decay, was infrequent. If there was a marked susceptibility to caries at the onset of the diabetes, the progress of the caries and acquisition of new caries was slowed.

Difference in nutrition seems not to be the only reason for the low suscepti-

bility to caries, as all the patients Dr. Stein examined are on a normal mixed diet. Changes in the composition of the saliva and other factors seem to play a part, he said.

Pyorrhea and other diseases of the gums, on the other hand, do afflict diabetics, particularly as they grow older. Pyorrhea was not found affecting the temporary or "baby teeth," but one-fourth of the patients over 18 years of age had pyorrhea or other diseases of gums and tooth sockets, and three of these patients had lost all their teeth by loosening.

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## POPULATION

### Population Trend Alarming To Statistical Expert

**A**LARM over the trend toward lower birthrates was expressed by Prof. Raymond Pearl of the Johns Hopkins University in his presidential address before the American Statistical Association in Philadelphia in which he said people in the prime of life are contriving to throw off some of the burden of supporting young and old by having fewer children.

"Just possibly what mankind is slowly and steadily doing," Prof. Pearl warned, "may turn out in the long run to be the moral equivalent of curing a toothache by the effective but disastrous technique of cutting off the patient's head. There is no good in making life easier if there is not going to be anybody around to live it."

The world's population, he said, increased nearly five-fold in the three centuries between roughly 1630 and 1930. This brought about present efforts to lessen crowding and discomfort, which now are showing results in lowered birthrate and increasing numbers of the old.

Analysing the United States' biggest population problems, and citing "such weird economic philosophies" as those currently associated with "ham and eggs" or "\$200 a month," Prof. Pearl said:

"It is plain that the old folks, on the one hand, and the youngsters, on the other hand, by their own lusty bellowings and the supplementary skullduggery of their 'humanitarian' friends are ganging up, as the expressive phrase goes, on the half of the population that does the work, pays the bills and taxes, and in cold fact earns the livings for all."

Counting both young and old, the burden borne by the harassed section of the population between 15 and 50 years old, is actually not so great as it was a cen-

tury ago, Prof. Pearl finds. In 1840 for every 1,000 persons of these ages there were 1,084 younger or older to be taken care of; in 1930, for each 1,000 of the "reproducer-worker phase of life" there were only 880 persons besides themselves to be cared for.

## PUBLIC HEALTH

## "Grapes of Wrath" Migrants Get Help Through Association

**M**EDICAL help for the acute health problems of the "Grapes of Wrath" migrant agricultural workers in California and Arizona is being given as fast and far as possible by the Agricultural Workers Health and Medical Association, it appears from a report to the American Medical Association by its bureau of medical economics chief, Dr. R. G. Leland.

Nearly 38,000 migrant workers and their families have already been given medical, dental, hospital and other health care by this mutual benefit association, organized in May, 1938. Doctors, dentists, druggists and hospitals of California and Arizona, the Farm Security Administration, the California State Department of Public Health and the U. S. Public Health Service have cooperated in planning and carrying out the program. The Association is empowered to borrow money for paying doctors' and other bills and purchasing supplies, from the Farm Security Agency or other federal or state agencies. For the first year of operation \$952,597.97 was spent.

To instill into the minds and consciences of the mass of our people that their chief concern is the composition of the population may, Prof. Pearl said, be the principal duty of the American Statistical Association in years ahead,

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Headquarters of the Association are at Fresno, Calif., with regional offices in Arizona and as far north as Willows, Marysville and Santa Rosa, Calif. The personnel of these regional offices has followed the crops, in the wake of the migrant army, in order to be near at hand to serve it. At first member patients were referred to doctors' and dentists' offices in the vicinity, but now most of them are served in clinics staffed by doctors chosen by the county medical societies.

Influenza, pneumonia and other respiratory diseases and digestive diseases ranked high in numbers of member patients treated. Malnutrition and dietary deficiencies were fairly prominent among children. Babies were delivered, broken bones were set, infections, injuries and dental troubles were cared for. Services are primarily for acute sickness or injury, but when a chronic illness threatens the welfare of the entire family by laying up its breadwinner or the mother, such illness is treated.

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the theory that the structure of the Atlantic and Pacific basins may be more similar than heretofore supposed.

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## Quakes Come in Groups

**T**HE earthquakes that wrought worse havoc than war in Turkey were third in a series of four severe disturbances that occurred in widely separated parts of the earth in less than a week. Five days before, there were two quakes centering off the Pacific shore of Costa Rica and one in the northern part of the island of Celebes; five days afterwards a sharp shock was felt in southern California.

It is not uncommon for earthquakes to come in groups like this, with intervening periods of relative quiet. Why they should do this is one of the things that still puzzles scientists.

It is possible that one earthquake can set off another, even in a remote part of the earth, seismologists of the U. S. Coast and Geodetic Survey stated. This could happen, however, only when the second locality was "all set" for an earthquake that would occur later on anyway. If the rocks of the earth's crust were in the state of severe strain that precedes an earthquake and is relieved by it, even a slight additional push, such as might be provided by waves traveling through the earth's core, might act in the capacity of the proverbial last straw and precipitate the break.

Other "triggering forces" that have been invoked as possibilities include the tidal pull of sun and moon and the occurrence of large changes in barometric pressure over the affected area.

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## SEISMOLOGY

## Earthquake Gives Scientists Hint of Earth Structure

**T**HE SEVERE earthquake in Turkey which destroyed thousands of lives and caused great property damage on the day after Christmas has provided American seismologists with new scientific evidence as to the nature of the layers of rock underlying the Atlantic Ocean.

Scientists at the University of Vermont have reported to the U. S. Coast and Geodetic Survey that besides the large surface waves, expected in any violent earthquake, their instruments detected a high speed type of surface wave which

is ordinarily observed only in earthquake shocks which reach the United States over pathways under the Pacific Ocean where there is little overburden or continental structure.

The arrival of this type of wave for the Turkey quake is taken to indicate an unusual disturbance in the deep basaltic rock of the earthquake area, say Coast and Geodetic Survey scientists.

The character and speed of the normal surface waves at the University of Vermont station also give added evidence to

## ENGINEERING—CHEMISTRY

## Steel Mills Are Run On Fabric Bearings

See Front Cover

**C**LOTH saturated with a synthetic resin and baked and squeezed under pressures up to 6,000 pounds per square inch formed the bearing for the roll neck of a steel mill stand shown on the front cover of this week's SCIENCE NEWS LETTER.

It is said then to be as hard and as strong—pound for pound—as the steel itself. The material is known as Micarta and is made by the Westinghouse Electric and Manufacturing Company.

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An air conditioning system protects rare violins in the Library of Congress.