

## SCIENCE NEWS

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### U. S. LEADERSHIP IN HEALTH PROTECTION

THE United States is in danger of losing, if she has not already lost, her position as leader in health protection for the people of the western hemisphere, according to a report by Dr. Thomas Parran, surgeon general of the U. S. Public Health Service, at the St. Louis meeting of the American Public Health Association, who gave the result of his findings on his visits to Mexico and to the Pan-American sanitary conference in Rio de Janeiro.

When air travel between North and South America was instituted some years ago, the United States was greatly concerned over the possibility that yellow fever would be reintroduced to the country from South America. Now Brazil is rightly exercised and has made representations to our State Department because yellow fever mosquitoes and even the tse-tse fly, carrier of deadly African sleeping sickness, have been found on American airplanes entering Brazilian ports from Africa.

The Brazilian government, at a cost of \$2,000,000 and with aid from the Rockefeller Foundation, which spent \$200,000, has eradicated both African and American yellow fever mosquitoes from all her port cities and from eight of her states. Dr. Parran stated that only one United States port, Miami, Fla., had done anything like this.

Americans need to recognize that continental health security and solid Pan-Americanism run on a two-way track. Brazil's vast accomplishment in wiping out yellow fever danger in her cities and states does not remove the danger of yellow fever striking Brazilians or other Americans unless we and other American nations wipe out the yellow fever danger within our own boundaries.

### NUTRITION IN GREAT BRITAIN

COMFORT for Americans disturbed by the prospect of one cup of sugarless coffee per day, at least one meatless day per week and probable restrictions in butter and in variety of vegetables was given in a report to the association by Sir John Boyd Orr, director of Great Britain's Imperial Bureau of Nutrition.

Britain in the fourth year of war is down to something like iron rations, with all luxury foods cut out, but the diet of the people in Britain from the viewpoint of health is about as good as it was before the war. There are no signs of malnutrition, and child health is actually better than before the war. Wealthy people are eating about a third less food than before the war, while the poor are getting diets much richer in vitamins and minerals. Drastic changes in the national diet have been brought about with almost complete absence of grumbling. There is no food hoarding; it is definitely not the thing to do, according to universal public opinion.

Britain has won the war on the food front partly through lend-lease shipments of food from America, for which Sir John expressed heartfelt gratitude to the United States and Canada, and partly through greatly increased

production of food and milk at home. The amount of land under the plow is now 50 per cent. greater, representing an increase of six million acres, than it was before the war, when two thirds of the food was imported. There appears to be no farm labor man-power problem in Britain. Men, women and children all work in their gardens and allotments after they have finished their day's work in factories, offices and schools.

England intends to win the peace on the food front by keeping home production up to a two thirds increase. Sir John pointed out that America must increase her food production greatly if she and the British commonwealth of nations are to avoid post-war defeat on the food front. —JANE STAFFORD.

### TOOTH DECAY AND PLACE OF RESIDENCE

THE best teeth in the nation, at least among children and men of military age, are found in Arkansas and the South and Southwest generally, was stated by Dr. Bion R. East, dentist and public health professor of the College of Physicians and Surgeons, Columbia University.

The worst teeth are found in New England, Dr. East reported after studying draft records of the 1918 Army, the 1863-1864 Federal Army and the preliminary figures from the 1940-1942 draft. The 1918 records showed that when measured by the Army's standards, the teeth of the men of Vermont were thirty-five times poorer than those of Arkansas. Missouri rated high in excellence of its men's teeth in 1918. Study of draft rejections then showed that only three states in the nation had lower rejection rates for dental defects than did Missouri.

"The probability that the reported differences were not due to chance," Dr. East stated, "is strengthened by similar results obtained in a survey made of U. S. Navy recruits of 1934. In that survey the New England men, when compared with those of other sections of the country, also had the most evidence of past and present tooth decay. Arkansas, the state with the lowest rejection rate for dental defects in the draft of 1918, had the best record in this respect in the Navy's survey of 1934.

"Preliminary reports from the drafts of 1940-42 suggest that marked variations in the magnitude of the rejection rates for dental defects will again prevail among the different states. The indications are that New England will again lead the rest of the country in the percentage of men rejected for military service for poor teeth and that the men of the southern and southwestern states will again have the low rates. Similar trends in the distribution of tooth decay were found in dental surveys of children residing in different states."

Reasons for the relation between tooth decay and place of residence were not given by Dr. East, but his findings coincide with earlier findings of U. S. Public Health Service scientists on the relation of fluorine in the drinking water, mottled enamel and tooth decay. Fluorine in drinking water and the mottled enamel it causes are both prevalent in the Southwest, but the mottled enamel teeth

rarely decay. New England water supplies, so far as they have been tested, are fluorine-free.—JANE STAFFORD.

### A TYPHOID FEVER VACCINE

A STEP toward development of a more powerful anti-typhoid fever vaccine has been taken in research by Dr. Jules Freund, New York City Health Department Bureau of Laboratories. Results so far of Dr. Freund's work on both typhoid and diphtheria are announced in the first annual report of the Public Health Research Institute of New York City issued by Dr. Otto A. Bessey, director of the institute.

By injecting killed tuberculosis germs and lanolin-like substances into animals, Dr. Freund has discovered, their production of typhoid fever-fighting anti-bodies is increased in response to invading typhoid germs.

"In a way, this means production of a more potent vaccine against typhoid," Dr. Thomas Rivers, director of the Hospital of the Rockefeller Institute and now Commander in the Medical Reserve Corps, U. S. Navy, as well as chairman of the institute's scientific council, explains.

"Whether this method actually gives a more potent vaccine for protection of people against typhoid fever, however, can not be stated until field experiments have been made."

Efforts to increase the potency of diphtheria toxoid by the same methods are now being made by Dr. Freund.

Nutrition studies are another project of the institute, which is said to be the only municipal organization of its kind in the world.

Nutritional assays of foods sold in New York City markets will be undertaken in order to find out whether, when the housewife buys foods for their vitamins and minerals, the foods contain the amounts of these essential diet factors she expects them to contain on the basis of food value tables. Meat, vegetables and other foods may vary widely in their vitamin and mineral content according to their region of growth because of the differences in soils in various parts of the country.

### PULSATING STARS

STARS of the strange class known as RV Tauri-type pulsate in fundamentals and overtones. Dr. Cecilia Payne-Gaposchkin, of the Harvard Observatory, speaking before the Association of Variable Star Observers, described her method of using organ pipes to correlate the vibrations of air columns with those of gigantic stars far off in space.

Only 29 RV Tauri-type stars are known, but there were only 13 known in 1927, so they are being found rather frequently. They are stars whose light fluctuations are extremely variable. Their light becomes very much fainter than normal at intervals, but about in the middle of these intervals, they do a less noticeable dimout. However, these "primary" and "secondary" minimums of light sometimes change places in the RV Tauri stars, and sometimes some of them seem more like Cepheids, another class of variable star which is much more abundant. Cepheid variables are pulsaters, and they undergo their alternate contractions and expansions at regular intervals—the principle of harmonic vibrations, well known to

musicians, has been successfully applied to them by Dr. Martin Schwarzschild, of Columbia University Observatory.

But the RV Tauri sometimes vibrate in their fundamental tone and sometimes in the first overtone or harmonic. They may change back and forth at will, thereby producing hitherto unexplainable changes in their light fluctuations. The Cepheids resemble the heavy and low note of the long pipes; the so-called Cluster variables to the short high-pitched notes; while the RV Tauri stars were in between, giving pleasant tones of one octave separation.

All such vibrating variable stars are known to be considerably larger and brighter than our sun, which is a "dwarf" star of comparatively quiet habits—to our good fortune.

### ITEMS

MOTORS and trucks now doing essential service on our highways can be operated a longer time without reconditioning by the use of expander type piston rings, P. E. Friend, of the Wilkening Manufacturing Company, told the Society of Automotive Engineers meeting in New York. Plane non-expander piston rings, Mr. Friend said, work all right so long as the cylinder is round and straight. But so soon as it is worn a little more in some spots than in others—is no longer truly circular or straight up and down—the ordinary ring fails in its function because it rides over the irregularities. The expander type, he explained, is more flexible and has inner springs which exert independent pressure against every part of the cylinder, so that the ring conforms to the variations in the contour of the cylinder wall. Consequently a worn cylinder can be used much longer, and because of the flexibility of the ring, there is less wear in the first place. At least six engine manufacturers, he said, are supplying these rings as original equipment, and many others buy them and stock them for replacement service.

THAT the cause of death in asthma and some kinds of pneumonia is a metamorphosis of the lining of the bronchial tubes which makes them bald instead of hairy was announced by Dr. A. C. Hilding, of Duluth, Minn., at the Chicago meeting of the American Academy of Ophthalmology and Otolaryngology. The fine hairs, called cilia, which are normally present in the lining of the bronchial tubes can readily and easily remove mucous secretions. But in the cases Dr. Hilding studied, the hairy lining of the tubes had changed into another kind of tissue which had no hairs. Consequently the thick mucous substance accumulated in the tubes and the patients died of asphyxiation. Aggravating the difficulty is the fact that the changed and bald cells themselves produce a secretion which they only partly extrude. This fuses with the general mass of secretion but remains anchored to the cells lining the bronchial tubes, thus aggravating the difficulty of emptying the bronchial tract. "The ciliary mechanism," Dr. Hilding reported, "is also more or less completely incapacitated in bronchopneumonia, bronchiectasis and influenzal pneumonia. Loss of function is doubtless an important factor in the progress of these diseases."