

with the vaccine at Hamilton lost their lives and a number have been seriously ill as a result of infection picked up in the course of their work with the spotted fever ticks.

The latest advance has been made by Dr. R. E. Dyer and Ida A. Bengtson, senior bacteriologist of the federal health service. These two have succeeded in growing the Rocky Mountain spotted fever virus on chick embryos. The latter substance is being used increasingly for cultivation of viruses and is now being used for the production of vaccine for smallpox.

Since the Rocky Mountain spotted fever virus can be grown and kept alive apparently indefinitely on chick embryo, it may be possible to prepare the protective vaccine directly from it. This

would eliminate the expense of keeping animals on which to grow the ticks and also the danger of an infected tick's escaping and biting either a laboratory worker or some other unsuspecting person in the neighborhood.

Because of the cost and difficulty of preparing the tick vaccine, the federal health service has never been able to supply all the vaccine wanted by ranchers, hunters and others exposed to the Rocky Mountain spotted fever ticks. The situation has become more acute since the discovery that ticks on the eastern seaboard and in other widely separated parts of the country are infected with the virus of this disease which is thus no longer confined to a small, sparsely populated area of the Far West.

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## PHYSICS

## Cosmic Rays Show Earth's Magnetic Field is Lopsided

**D**ISCOVERY that the magnetic field of the earth is lopsided was announced by Dr. R. A. Millikan of the California Institute of Technology, before the meeting of the National Academy of Sciences. Dr. Millikan's wholly unexpected discovery comes as a result of studies on cosmic rays.

In attempting to discover the nature and distribution of cosmic rays, Dr. Millikan has changed the idea of the still-mysterious aura of magnetism that surrounds the earth.

He finds that the magnetic field extends into space to at least ten thousand miles from the earth's surface—far beyond the limits of the atmosphere.

The magnetic intensity is stronger on the side of the earth opposite to America. This is demonstrated by the fact that there is greater effect on the cosmic ray intensity, from the North Magnetic Pole to the Equator, in the region of India than there is in comparable latitudes in America.

Dr. Millikan's discovery has been discussed with the scientists who have studied magnetism during the past thirty-five years at the Department of Terrestrial Magnetism of the Carnegie Institution of Washington.

A comparison of magnetic variations on the surface of the globe with those high above the earth, as determined by cosmic ray intensities, shows that the variations of magnetism on the earth extend outward many thousands of

miles. Dr. Millikan's results on terrestrial magnetism were obtained on the surface of the earth, and the extension of these results out into space was made by the use of simple laws of magnetism which govern such things as the running of an electric motor.

For the past hundred years, ever since the time of Karl Gauss, it has been assumed that the intensity of the earth's magnetic field was essentially uniform—a conclusion which is now revised by Dr. Millikan.

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## ENGINEERING

## Giant Salt Container Holds Twenty-Five Tons

**T**HE COVER of this week's SCIENCE NEWS LETTER shows a new 25-ton salt evaporator just completed for one of the largest salt manufacturers. Within it a bronze propeller stirs up wet salt and circulates it through more than 800 tubes where the water is distilled off.

The Lincoln Electric Co., which supplied the picture, states that the apparatus is fifty feet high and twelve feet in diameter at its largest point. Arc weld construction was used throughout.

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A new kind of popcorn in Mexico is said to pop to extra-fat limits, and is believed to be the descendant of an old Indian grain variety.

## PHYSIOLOGY

## Dieting Improves Health Of Over-Fat Children

**O**VERWEIGHT or obesity is so often associated with "middle-age spread" and "corporation front" that its occurrence in children is apt to be ignored. It is so easy to say, "Oh, my people are all fat like that," and to attribute to the ductless glands the blame for such overweight.

Just as often the family eating habits are at fault. That such is the case is well shown by a report of Drs. Hannah Mulier and Helen Topper of the Pediatric Service of Mt. Sinai Hospital, N. Y., who gave "slimming" treatment to 25 overweight boys and girls not only without harm but with marked improvement in general health as well as in weight.

To do this required careful adaptation of the diet to fill the needs of the child. Not only must the diet furnish enough energy for the internal needs of the body organs and glands, but also for growth and for the child's activities. It must also be low enough to force the body to consume some of its own excess fat.

These doctors therefore gave relatively large amounts of protein foods, such as meat, eggs and cheese, to insure continued normal growth; with but small amounts of sugars and starches, and larger amounts than customary of the bulky foods, such as vegetables and fruits.

### Too Much Rich Food

All of the children treated had a history of over-feeding with rich foods, fats, sweets and pastries, and of high water and milk intake. Since some of the overweight of obesity is due to the retention of water by the body tissues, especially when a high carbohydrate diet is eaten, fluids were limited to 15 or 20 ounces daily, and salt not to exceed 15 grains, because it, too, is concerned with water storage in the body.

Increased participation in outdoor sports, swimming, walking, tennis, was gradually encouraged, and the results were well worth the effort taken. Not only did the children lose some of their excess fat, averaging three-quarters of a pound loss per week, but they continued to make more than the normal gain in height for children of their age, 5 to 14 years. They lost their passion for excessive food, became much more interested in work and school study and outside activities, and manifested an increased sense of well-being and alertness. In addition, some of them who