

a science, Dr. Stewart said that the principles of mathematical physics can be used in the social field.

Individuals are treated as molecules, he explained. Persons are given "molecular weights," in the way physicists have assigned weights to molecules and atoms. Some individuals have a "weight" of two, while individuals in some groups rate only one-third in the weighing.

With this system, Dr. Stewart has used equations of Newtonian gravitation in what he terms demographic gravitation. The results, which may come out in such units as "persons squared per mile," will show the national income or any of a large variety of other social statistics.

City suburbs, he explained, can be

compared with the satellites of planets in the solar system. When a satellite gets too close to a planet, it is torn apart. A village near a city "is drawn out in long lines in the direction of the overpowering attraction of the central city," he said, unlike the more isolated village built around a center, or nucleus.

Even the gas laws of physics can be applied to humans, Dr. Stewart contended.

Individuals want some living space of their own which gives the "human gas" a tendency to expand. Populations of cities, he suggested, are a compromise between gravity toward the centers of attraction and the expanding feature of gas.

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## ENGINEERING

## Low-Temperature Battery

Minus 100 degrees is the functioning capacity of new electric batteries now under development. They will have military as well as civilian applications.

► ELECTRIC batteries that will function at a temperature of 100 degrees below zero Fahrenheit are under development for the Army Signal Corps at Ohio State University, it is revealed. Experimental test cells which will operate at this temperature have already been constructed.

Batteries for use at extremely low temperatures have many military applications, but have civilian applications as well. High-flying airplanes in the stratosphere encounter temperatures from 60 to 70 degrees below zero. Guided missiles and the battery-powered radio-sonde, which is carried aloft to report weather conditions by radio, may meet even lower temperatures. Automatic ground-based weather stations in Arctic regions may be required to record and report the lowest temperatures found on the surface, and cold chambers used in research work sometimes have temperatures lower than any known that nature provides.

The selection of an electrochemical system was one of the first problems in developing a low temperature battery. It must be able to withstand long periods of storage under all atmospheric conditions, and not freeze at minus 100 degrees. The electrolyte must not disintegrate at normal or high heat, and also have the proper electrical characteristics to operate equipment at very low temperatures.

In the investigations already made, several solvents that possess the necessary characteristics have been uncovered. Solute-solvent systems were then studied to find good conducting mediums which would keep the internal resistance of the battery at a minimum when far below zero. Present research is directed toward electrode materials to determine the most suitable electrochemical couple, the proper combination of materials to produce electricity, for low temperature operation.

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## CHEMISTRY

## Benzene Hexachloride Found to Flavor Pork

► BENZENE hexachloride or 666, potent new insecticide, has been highly successful in ridding hogs of lice and mange; but it is inadvisable to use it on the animals just before they are slaughtered. Experiments in support of this conclusion were reported by Dr. R. H. Grummer, R. W. Bray and Dr. Gustav Bohstedt of the University of Wisconsin.

They treated three lots of pigs with the insecticidal dust, and part of them they also sprayed with a benzene hexachloride solution a short time before slaughtering them. Meat from recently-sprayed animals had "off" taste and

odor when tested by several judges. Cooking smells, described as "medicinal," persisted in the kitchen for a long time after the meat was prepared.

For these reasons, the three scientists recommend that no benzene hexachloride treatment be given hogs for at least ten days before slaughter.

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## MINERALOGY

## New Argentine Mineral Named for National Hero

► A NEW mineral has been discovered in Argentina and named after a national hero.

The mineral, called sanmartinite, was found southwest of San Martin. The name is for the city which in turn was named for Gen. Don Jose de San Martin, a leader in the fight for South American independence.

Sanmartinite is a zinc tungstate, first spotted in the study of a sample of tungsten ore. It is a member of the wolframite group of minerals.

First report of sanmartinite in this country was made to the Academy of Natural Sciences of Philadelphia by Victorio Angelelli, Argentine geologist, and Samuel G. Gordon, associate curator of mineralogy and petrology of the Academy.

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## WILDLIFE

## Porcupines Chew Glass, Gnawed Bottle Shows

► GLASS-EATING is not confined to a few humans with abnormal appetites; porcupines do it, too. So declares F. W. Preston, glass technologist of Butler, Pa., and to prove it he exhibits a catsup bottle with a hole chewed clear through one wall near the bottom. The unusual specimen was given to him by John Hopkins, a game warden in the hills near Clarendon, Pa.

On this and other bottles bearing porcupine tooth-marks, the animal had apparently set one pair of its chisel-like incisors against the edge, and forced the opposite pair towards it with its powerful jaw muscles, loosening small chips of glass.

Why the animals should want to chew up bottles is still unguessed, unless perhaps it is an appetite for small amounts of the alkali that leaches out of the glass on exposure to the weather.

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