CHEMISTRY

How Salt Substitute Kills

Rat experiments have shown that lithium chloride, used by some patients in place of salt, causes death by its inhibiting effect on the use of food by the body.

➤ THE WAY in which lithium chloride causes death has been discovered by Dr. John MacLeod, of the Cornell University Medical College in New York.

His experiments on rats show that lithium in low concentrations produces an inhibitory effect on the breakdown of glucose to lactic acid, one of the fundamental processes of the use of food in the body.

Deaths reported of patients with heart and kidney disease who used lithium chloride instead of ordinary sodium chloride salt in their diet are thus shown to have an experimental theoretical basis.

Dr. MacLeod's conclusions will appear in a paper ready for publication in the AMERICAN JOURNAL OF PHYSIOLOGY and were made available to Science Service on account of their relationship to the dangerous use of this chemical medically. The work was completed two years ago as a purely academic study and is only ready for publication now.

Dr. MacLeod found the inhibitory effect in human spermatozoa and he found that it destroyed the ability of these cells to move. When lithium chloride was injected under the skin of rats (dosage level of 120 milligrams per kilogram) it caused too much irritability in the rats, weakness of hind legs, and generalized tremors which appeared particularly when the rat was stimulated. In general such an acute dose of lithium chloride produces death in rats within 28 hours.

The chronic effects of injecting small doses of lithium chloride in rats daily over protracted periods, Dr. MacLeod found, is to produce such symptoms when an injection level of five milligrams daily and a total level of 150 milligrams is reached. This indicates that lithium is retained in the body, in part at least, possibly in the muscles.

Dr. MacLeod concludes that there is considerable resemblance in the effects in rats and the symptoms in human beings by analogous intakes of the salt. If the doses producing the effects in normal rats are extrapolated on a weight for weight basis to humans, an intake in the human of from 1.4 to 2.8 grams daily of the salt theoretically would produce symptoms in from two weeks to a month. (One gram is about a thirtieth of an ounce). Dr. MacLeod emphasized that this is theoretical and may have no relationship to the doses taken in the human toxicity cases recently reported.

Muscular weakness which is one of the characteristic symptoms in the rats and humans is due, it is suggested, to interference with carbohydrate breakdown in the skeletal muscles, thus interfering with energy breakdown in the muscle. Lithium chloride might impose an extra strain on an already deficient heart, in cases of cardiac deficiency on a salt-free or salt-substitute diet.

Science News Letter, March 5, 1949

PHYSICS

Cornell Founder's Tunnel Site of Cosmic Ray Studies

➤ A WATER tunnel blasted through 193 feet of solid rock more than a century ago by a young engineer is now being used for modern cosmic ray studies by scientists from the University which the engineer later founded.

Ezra Cornell, 24, drilled the tunnel while he was superintendent of Beebe's mill in Ithaca, N. Y., in 1831. More than three decades later, in 1865, he founded Cornell University.

Dr. Kenneth I. Greisen, director of cosmic ray research in the University's Floyd Newman Laboratory of Nuclear Studies, announced that Cornell scientists are going to use the tunnel for studies in one of the most advanced fields of modern physics, cosmic ray research. The scientists will measure the intensity of the cosmic ray bombardment as it is filtered by the 25 feet of limestone above the tunnel.

Science News Letter, March 5, 1949

ASTRONOMY

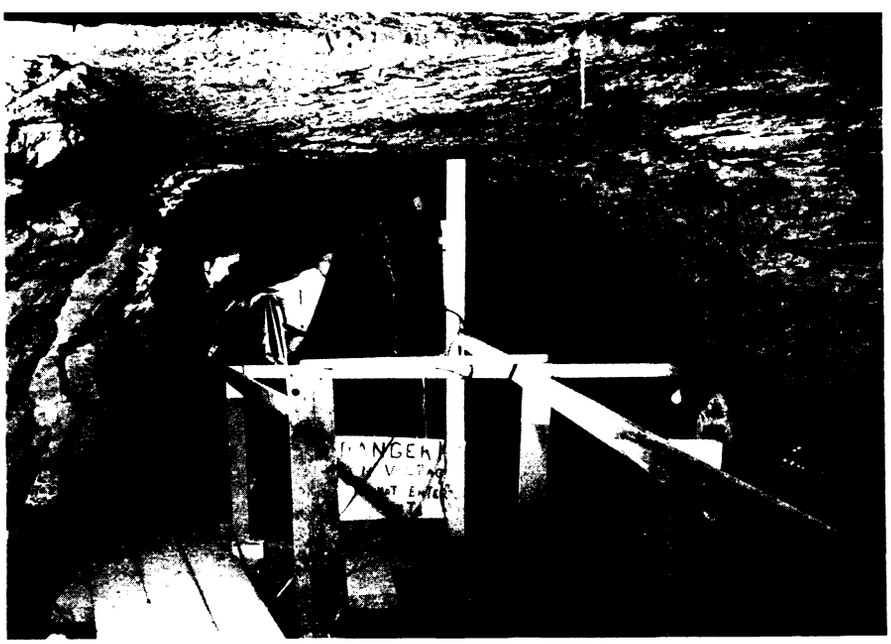
Faint Object Spotted In Constellation of Leo

➤ A FAINT object has been spotted moving across the constellation of Leo, the lion, visible these winter evenings high in the southeast. It lacks an identifying tail and astronomers are not yet certain whether it is a comet or a minor planet.

Of the sixteenth magnitude and thus far too faint to be seen with any but the best telescopes, this celestial traveler was discovered Feb. 19 by Dr. Frank K. Edmondson of the Goethe Link Observatory of the University of Indiana, Bloomington, Ind.

The object is moving northwest, according to word just received at Harvard College Observatory, astronomical clearing house for the western hemisphere. When discovered on Feb. 19, the object's right ascension was nine hours, 46.6 minutes, its declination plus 11 degrees, 48 minutes. Its daily motion in right ascension is minus one minute, five seconds; in declination plus eight minutes.

Science News Letter, March 5, 1949



STUDY MESON BEHAVIOR—This tent, pitched on a platform over six feet of water, shelters recording equipment in a water tunnel where the behavior of cosmic ray particles are being studied.