PUBLIC HEALTH

Find New Danger in Radioactive Fallout

➤ ANOTHER POTENTIALLY deadly compound, manganese-54, has now been found in radioactive fallout, adding to the already existing danger from strontium-90.

The discovery of the radioactive manganese is reported by Drs. William H. Shipman, Philip Simone and Herbert V. Weiss, U. S. Naval Radiological Defense Laboratory, San Francisco, Calif., in *Science* (Nov. 8).

Manganese is a metallic trace element found in small quantities in human cells, and it is believed to be necessary for normal cell life.

Its presence in radioactive fallout was revealed when a fallout sample was found to be giving off gamma rays with the same energy as those known to come from radioactive manganese. Chemical analysis proved the unknown substance was manganese-54, and calculations showed large quantities of it were produced at the time of bomb detonation.

The discovery again emphasizes the importance of considering induced radioactivities in fallout, the scientists report.

The radioactive manganese may be produced when stable, or non-radioactive manganese and iron are bombarded with high energy neutrons, they explain. Further studies are planned to see how much of the radioactive metal is being taken up by living systems.

Science News Letter, November 23, 1957

ENGINEERING

Trucks Floated on Air Carry Heavier Loads

➤ TRUCKS and buses can be made lighter and smaller and at the same time carry larger and heavier loads by floating them on air in the manner of many 1958 passenger cars.

Commercial vehicles in which air suspension replaces springs will offer owners increased payload capacity and decreased operating costs.

D. J. LaBelle, GMC Truck and Coach Division, General Motors Corporation, told the Society of Automotive Engineers National Transportation meeting in Cleveland that air suspension permits complete redesign of commercial vehicles.

They can be made smaller in overall size, yet roomier inside, allowing a reduction in the size of body and frame parts. By eliminating the strains of friction and grating that are transmitted through leaf and coil springs, Mr. LaBelle said, air suspension will also permit the use of lighter metals and even plastics in vehicle construction.

The bodies of most present vehicles are supported on steel springs. Air-suspended vehicles, such as some buses and some 1958 passenger cars, are supported on four rubber bags filled with air, one at each corner of the body.

Valves and levers permit air to enter or leave the bags as dictated by the bumps over which the vehicle is traveling. Air is supplied from a compressor on the engine.

Because of the control of air in the bags, the supported vehicle body always remains at a constant height from the road, and relatively level.

In designing a vehicle using springs, engineers must allow large clearances between the body and underframe to keep the parts separated when the springs compress over bumps. Designers of new vehicles will be able to use this space for payload and, as parts can be closer to each other, can streamline their trucks and buses.

In designing a 35-foot trailer, engineers usually allow three to five inches deflection space between the van and underframe for spring compression. In a trailer of that size, the engineer reported, each inch of deflection space robs the van capacity of 21 cubic feet. Using air compression support, 60 to 100 cubic feet can be added to the carrying capacity of a standard 35-foot trailer.

In addition, Mr. LaBelle pointed out, the driver of a commercial vehicle will be given passenger car comfort.

Science News Letter, November 23, 1957

NATURAL RESOURCES

Frozen Sea Water Drinkable But Costly

➤ FREEZING SEA water to remove salts produces good drinking water and ideal industrial and irrigation water, but is too expensive a process at present to be called an answer to the nation's growing water shortage.

Although technically succesful systems for the purification of large amounts of sea water by freezing have been devised, development of equipment not now available will be necessary before the technique can be made economical, Carlyle M. Ashley and Cyrus M. Bosworth Jr., Carrier Corporation, Syracuse, N. Y., reported to an international symposium on salt water conversion meeting in Washington, D. C.

Scientists long have purified water solutions of chemical compounds, known as salts, by freezing. At the freezing point of a water-salt solution, the water freezes out of solution leaving behind constantly increasing concentrations of the salts.

Studies reported on a variety of freezing techniques by Prof. H. M. Hendrickson, University of Washington, Seattle, indicated that "fantastically low ice production costs" will be necessary in order to meet the cost requirements of potable water.

Prof. Hendrickson reported water can be desalted by freezing at a cost of $2.32 per 1,000 gallons. In comparison, a distillation process under investigation converts water at a cost of $1.94 per 1,000 gallons, he said.

Desired costs are 30 to 40 cents per 1,000 gallons of drinking water or 10 to 12 cents per 1,000 gallons of very slightly salty irrigation water.

The symposium was jointly sponsored by the National Academy of Sciences-National Research Council and the U. S. Department of the Interior.

Science News Letter, November 23, 1957

IN SCIEN

SURGERY

Face Lifts No Cure-All For Aging, Surgeon Says

➤ FACE LIFTING by plastic surgery can turn back the clock but not stop it, Dr. Michael Gurdin, Cedars of Lebanon Hospital, Los Angeles, Calif., told the American Society of Plastic and Reconstructive Surgery meeting in San Francisco.

Five to ten years can be erased by the surgery, but then there is a gradual return to the former condition as the aging process continues.

Dr. Gurdin described a spry 81-year-old who commented, after her fourth face lift, "Thank you, doctor, I will see you again in five or six years."

Face lifts are being requested most frequently today by both men and women whose work is dependent on their appearance, such as entertainers, saleswomen and cosmeticians.

Widows and divorcees, who must seek work in their forties and fifties, are specially deserving of consideration. But the experienced plastic surgeon turns down many other applicants for rejuvenation surgery. These include women without enough wrinkles to make surgery practical, patients with skin diseases that have caused much scarring and degeneration of the skin, and the "narcissistic perfectionist" who brings with her a retouched glamour photo taken 20 years earlier.

Another type usually turned away is the one who is so emotionally disturbed that she refuses to look in a mirror while discussing the proposed surgery, Dr. Gurdin said.

Patients like these are told they would be better off spending their time and money with a competent psychiatrist instead of attempting surgery.

Science News Letter, November 23, 1957

TECHNOLOGY

Northern Radar Stations To Get New-Look Cover

➤ THE AIR-INFLATED radomes used to house and protect the nation's radar antenna stations in the North will be getting a new look in wearing apparel, the Air Force has revealed.

A sandwich-type fabric of Du Pont Dacron with a Hypolon coating has been developed by engineers and scientists of the Air Research and Development Command's Center at Rome, N. Y. The fabric is said to weigh only one-half that of the presently used radome covering.

In addition to offering a longer life expectancy, an advantage in remote locations, the fabric-covered radome will cost less to make and will be easier to handle and transport.

Science News Letter, November 23, 1957

CE FIELDS

MEDICINE

Beef Brain Extract Used To Treat Mental Patients

➤ INJECTIONS of a beef brain extract have been given to mental patients and have brought about a constant improvement in their condition.

This is reported by Dr. Mark D. Altschule, Harvard Medical School, who has spent six years studying the effect of injections of a protein-free extract prepared from the pineal glands of beef cattle.

The injections improve sugar metabolism in chronically ill patients and bring about "striking" changes in the behavior of the patients and an improvement in their blood chemistry.

Dr. Altschule warns against premature enthusiasm, however, since there have only been limited trials of the extract to date.

The beef pineal gland is a small, flattened, cone-shaped body growing from the upper portion of the mid-brain. It is about twice the size of a grain of puffed rice and exactly what it does in the body is not yet understood.

The pineal glands of 15 cattle are needed to produce enough extract for one daily injection, Dr. Altschule reports in the *New England Journal of Medicine.*

Science News Letter, November 23, 1957

BIOLOGY

Frogmen May Stay Under Longer With Drug

➤ A DRUG that may allow Navy frogmen to stay underwater for longer periods than are now possible is being developed by the British Navy, Dr. H. J. Taylor, Royal Navy physiological laboratory, Alverstone, Hants., England, has reported.

Both the drug's name and its chemical make-up are secret, but if it proves successful in man it will allow divers much more time underwater.

Convulsions in divers and loss of consciousness are caused by oxygen poisoning, a condition that strikes frogmen who continue to breathe pure oxygen. With oxygen, however, a man can stay underwater without leaving a tell-tale trail of bubbles behind him.

As yet, the drug has only been tested in mice. It could be either useless or too dangerous to use in man, Lt. Comdr. E. H. Lanthier of the U. S. Navy's experimental diving unit, Washington, D. C., told SCIENCE SERVICE.

Even if it were able to stop the convulsions it might still be useless against the damaging effects of oxygen poisoning, he explained.

The drug might merely mask the body's reaction to the poisoning, while irreparable damage is taking place.

Naturally, divers are not eager to engage in well-controlled tests of the chemical since it would subject them to various degrees of oxygen poisoning.

Both the British and French navies have been carrying on animal experiments with similar-acting drugs but they have reported no definite plans yet for making human trials.

For deep diving, frogmen now breathe a mixture of nitrogen and oxygen. The nitrogen, a so-called "inert" gas, is added to the oxygen in order to dilute it, so that a diver can breathe the mixture longer than he could breathe pure oxygen.

It is not the ideal mixer, however, since it acts as an anesthetic under pressure. It creates a sleepy feeling which has been aptly called "the rapture of the depths" in nitrogen-breathing divers.

Science News Letter, November 23, 1957

NUTRITION

Food "Lipstick" Made For High Altitude Fliers

➤ "LIPSTICKS" full of food instead of lip coloring will soon be developed for the Armed Forces, Lt. Col. William D. Nettles, USAF, Quartermaster Food and Container Institute for the Armed Forces, Chicago, has reported.

The freeze dehydrated sticks of food will include chicken, turkey and beef items and will be used to feed high altitude fliers in full pressure suits, he told the Association of Military Surgeons of the U.S. meeting in Washington.

The sticks are being developed to replace the food tablets that were designed for use by pilots wearing oxygen masks. The tablets have had a low acceptance among the fliers.

Other space foods for air crews include liquid meat products plus a variety of canned dairy items.

Also in the testing stage are special food bars, six of which make up an all-purpose survival food packet. The high-calorie bars, designed for combat feeding, all have approximately the same food value but each has a flavor that is widely different from the other five.

Four thousand packets of food sticks have already been made up and are being tested by the Air Force, Army and Navy. Current research in this type of "austere diet" will be useful in the age of space flight, Col. Nettles said.

Radiation-preserved food is still very much in the experimental stage, but a great deal has been learned in the five years since the radiation study began.

Now there is no doubt that an "end product" can be produced and early toxicity studies in humans have already been done. The problem now is to start setting up ways to evaluate these new products.

Foods preserved by radiation develop colors and odors that are different from those now expected, and new regulations concerning their wholesomeness will have to be set up.

If this is not started now, the Armed Forces will find themselves with new products that it does not know how to evaluate, Col. Nettles concluded.

Science News Letter, November 23, 1957

SURGERY

Embryo Cow Skin Used For Human Grafting

➤ SKIN TAKEN from a cow embryo has been used to replace skin from human volunteers, Drs. Blair O. Rogers and John M. Converse, New York University-Bellevue Medical Center, New York, reported to the American Society of Plastic and Reconstructive Surgery meeting in San Francisco.

The cow skin is taken from a three-month-old calf embryo and, although not as effective as frozen or fresh human skin grafts, will "take" and give a satisfactory covering for about eight days before being sloughed off.

No animal skin will last as long as fresh skin from another human or frozen dried human skin, but these too slough off eventually, unless they are transplanted between identical twins.

How useful the cow skin might be for human surgery, the doctors would not say.

"The mere fact that bovine (cow) embryo skin can be used at all is of interest, they said.

Another reported substitute for human skin was the lining from the gastrointestinal tract, which includes the stomach and intestines.

Use of the mucous membranes as skin covering on animals and on one human volunteer was reported by Dr. Carter Maguire, Medical College of South Carolina, Charleston, and Drs. Nicholas Georgiade, Joseph McWhirt and Kenneth Pickrell of Duke University Medical School, Durham, N.C.

It transplanted easily and grew well at its new location but was unacceptable because it continued to have a slick velvety surface.

Science News Letter, November 23, 1957

ENDOCRINOLOGY

Reports New Theory Of How Insulin Works

➤ INSULIN, a body hormone necessary to prevent diabetes, does its job by attaching itself to cell walls, Dr. Maurice E. Krahl, University of Chicago, believes.

How insulin actually works in the body has long been a mystery. The hormone affects the absorption of sugar, production of starches, and use of oxygen by muscles, as well as the manufacture of fatty acids in the liver.

Insulin molecules are not strong enough to pierce the tough cell walls, so they attach themselves to the molecules in the wall, Dr. Krahl reports.

Then, by interacting with atoms, possibly zinc ones, in the wall molecules, the insulin starts a chain of chemical changes that reaches into the heart of the cell. Proof of the theory will require experiments in solid state physics rather than biology.

The report appears in the first issue of the quarterly journal, *Perspectives in Biology and Medicine.*

Science News Letter, November 23, 1957