MEDICINE

Tranquilizer Causes Loss Of Learning in Cats

➤ CATS that had learned to escape from an electric shock when they were warned of its coming by a darkening of their box or the sounding of a bell lost this learning when they were given a mild dose of the tranquilizer reserpine.

This is reported by Drs. E. Roy John, Bernice M. Wenzel and Robert D. Tschirgi of the University of California Medical Center, Los Angeles, in *Science* (Jan. 3).

The cat's failure to escape the shock was not due to a blocking of anxiety which might ordinarily be caused by the warning signal, the investigators found. Sometimes when a cat failed to escape the shock as it had learned, it would cringe, growl, and even climb to the ceiling of the box. Such behavior shows, too, that the tranquilizer does not prevent the animal from perceiving the signal. Neither does it interfere with the motivation to escape.

Instead, they conclude, the tranquilizer interferes with the learned association.

The tranquilizer was found to interfere more with the cat's ability to escape shock by responding to the visual cue of the darkened box than it did with the animal's response to hearing the warning bell.

The ability to escape on hearing the warning bell was learned more quickly and was retained by the animal better in spite of the dose of tranquilizer than was the response to the visual warning.

The dosage of reserpine was injected directly into the cat's brain.

Science News Letter, January 18, 1958

MEDICINE

Single Fat Meal Could Bring on Heart Attack

➤ A SINGLE MEAL could cause a heart attack if it contained too much fat, Dr. George J. Schoepfer of the University of Minnesota Hospitals, Minneapolis, believes.

Older persons who eat foods rich in animal or saturated fat exhaust the body's ability to clear fat from the blood stream. This blood fat then not only clogs the arteries feeding the heart but also makes blood clots more likely to develop.

Dr. Schoepfer's theory of heart disease is concerned with the so-called mast cells in the body. These are present in connective tissue such as bone, muscle and cartilage, and are important in transporting fats to places where they are either stored or burned for energy.

The mast cells liberate the anti-clotting substance heparin which, in turn, stimulates the production of lipoprotein lipase, an enzyme that acts to help carry fat through the blood.

Other scientists have found that in the hearts of older people who have atherosclerosis there is a smaller number of mast cells than in young people or even in older ones without atherosclerosis.

From these facts, Dr. Schoepfer has developed his theory of the one-meal heart attack.

A person with undetected atherosclerosis eats a meal rich in fat. The fat enters his blood stream and increases the likelihood of the blood's clotting. The lack of mast cells not only has reduced his clot-dissolving ability by lowering the heparin supply, but the low heparin level also slows up the process by which fats are cleared from the blood stream.

As a result of all of this, the fat from the meal produces a clot that lodges in a heart or brain artery already narrowed by fatty deposits. Dr. Schoepfer's report appears in *The New England Journal of Medicine* (Dec. 26, 1957).

Science News Letter, January 18, 1958

NATURAL RESOURCES

Research on Insects Needed, Not Pesticides

➤ WIDESPREAD regional sprayings of pesticides to control insect infestations and plant diseases is not the cure-all for the pesticide problem, warns Dr. John L. George, associate curator of mammals of the New York Zoological Park.

In a report he prepared for the Conservation Foundation and the New York Zoological Society, Dr. George points out that the U. S. suffers an annual $11,000,000,000 loss of food and fiber harvests because of insects, fungi, and other animal or plant pests. To offset this loss, some $260,000,000 is spent for chemicals to fight the pests. It is estimated that by 1975 we will be spending $1,000,000,000.

Recent campaigns to control the spruce budworm, the gypsy moth and, currently, the imported fire ant are examples of attempts to treat large areas with pesticide sprays. However, says Dr. George, in these campaigns the possibility of biological or natural control was neglected in favor of "quick kills" with insecticides.

There have been few studies of the effects of widespread chemical spraying on wildlife, on soil and on the parasites that normally keep down some insect pests. The report emphasizes the need for more of these studies, and for both field and fundamental long-term research.

In addition to the proven damage to fish populations—ranging from outright killing of some fish to destruction of their plant and animal food—and to some birds and small mammals, the long-run benefits from chemical insecticides may be questionable. In 1946 there was one insect of "public health importance" resistant to insecticides. Ten years later there were 36 resistant insects.

There is a further health problem: some pesticides, including chlordane, dieldrin and toxaphene, cannot be washed off most foods even by using a hot detergent bath.

Dr. George warns that greater emphasis is needed on evaluating the benefits from large-scale spray programs. Timely use of natural controls, many scientists believe, can save wildlife and dollars as well as destroying pests.

Science News Letter, January 18, 1958

IN SCIEN

PHYSIOLOGY

Positive Air Found To Affect Tissue

➤ POSITIVELY CHARGED air particles or ions have now been found to cause changes in living tissue, just as their negatively charged counterparts do.

When the trachea or windpipe of rabbits was exposed to the positive ions the mucus flow was slowed down and the tissue became much more sensitive to mechanical damage, Drs. Albert P. Krueger and Richard F. Smith, University of California, Berkeley, report in the *Proceedings of the Society for Experimental Biology and Medicine* (Dec. 1957).

Negatively charged ions have been reported to help cases of asthma and hay fever as well as reduce the pain in bad burn cases. Earlier reports about positive ions, however, indicated that they caused stopped-up noses and headaches, so their effects were studied on the rabbit trachea.

The action of the cilia, the tiny hairs that help move mucus and foreign particles along the trachea, was slowed down from the normal rate of 1,400 to 1,500 beats per minute to 1,100. Sometimes it was stopped altogether by the positively charged air.

The mucus flow and clearing ability also decreased markedly or completely stopped.

The positive ions made the cilia peculiarly vulnerable to mechanical damage. A gentle swab with wet cotton stopped them from beating when the tissue was receiving positive ions.

It is not at all obvious why air ions should have any ability to influence tissue. Nevertheless, evidence is collecting which proves that it does, the authors conclude.

Science News Letter, January 18, 1958

PHYSICS

Find Perfect Flow In Superfluid

➤ PERFECT FLOW, in which there is no viscosity and therefore no resistance, has been found for the first time by two California Institute of Technology scientists.

Drs. John R. Pellam and Paul P. Craig report their discovery in the *Physical Review* (Dec. 1, 1957). They tested fly wings as well as man-made wings of mica, Pyrex, quartz and wood in the superfluid.

The superfluid they used is a special kind of liquid helium that exists only at temperatures near absolute zero, 459.6 degrees below zero Fahrenheit. Known as helium II, this superfluid has to be separated from the normal helium with which it is mixed.

To do this, Drs. Pellam and Craig devised a "superfluid wind tunnel," then tested the various wings in it for their lift.

Science News Letter, January 18, 1958

CE FIELDS

MEDICINE

Cholesterol Effects Reduced by Exercise

➤ THE HARMFUL effects of eating too much cholesterol may be lessened by getting enough exercise.

Rabbits exercised daily while eating a high-cholesterol diet developed significantly less atherosclerosis than those not exercised.

This is reported by Drs. Sidney D. Kobernick, Gen Niwayama and Alexander C. Zuchlewski, Sinai Hospital of Detroit, and Wayne State University College of Medicine, Detroit, Mich., in the *Proceedings of the Society for Experimental Biology and Medicine* (Dec. 1957).

"In human beings as well as in experimental animals, very little attention has been paid to the question of the influence of physical activity on the atherosclerotic process," they report.

An electrified treadmill was used to condition the rabbits to run at the sound of a bicycle horn. One group of animals was exercised for five minutes twice a day before they ate. A second group got fed without the exercise. All of them received a diet high in cholesterol for 90 days.

The amount of atherosclerosis present in the exercise group at the end of that time appeared to be distinctly less than that in the sedentary group, and chemical tests showed the same thing.

The effect of physical activity was more evident in the relatively pure-bred litters than it was in some of the unrelated animals. This suggests, not surprisingly, that some individual "strain factor" exists in the amount of atherosclerosis developed.

Another interesting finding was that there was no relationship between the sex of the rabbit and how much atherosclerosis it developed. Some of the females in a given litter developed more atherosclerosis than the males.

Science News Letter, January 18, 1958

MINING

Germs May Take Part in Vital Mineral Processing

➤ THE SAME BACTERIA that cause diseases and form antibiotics to combat diseases are expected to play important roles in future recovery of valuable metals from low-grade ore and in producing synthetic fuels from oil shale.

The U.S. Bureau of Mines has revealed that four of its laboratories are conducting small-scale research on the role microbes can play in increasing mineral production.

Already, the Bureau reports, copper, nickel, cobalt and other metals have been recovered from low-grade ores mixed with bacteria. Scientists reported the presence of bacteria in small samples of ores enabled them to extract many times the amount of metal that could have been recovered without the bacteria.

The bacteria oxidize sulfur contained in the ores to sulfuric acid, releasing the free metal, experiments at the Bureau's Eastern Experiment Station, College Park, Md., have shown.

Scientists at the Boulder City, Nev., laboratory have used bacteria to aid in recovery of up to 99% of the manganese contained in a low-grade ore.

At Laramie, Wyo., scientists hope to substitute microbes for heat now used to produce petroleum products from oil shale.

Basic research on the bacteria, molds, yeasts and other tiny life forms that exist in coal is being conducted at Bruceton, Pa.

The Bureau of Mines emphasized that the work performed so far has been only on a laboratory scale; however, it does "justify hope that microbes may one day find commercial application" in mineral production.

Science News Letter, January 18, 1958

MEDICINE

"Superalcoholics" Find Usual Alcohol Too Tame

➤ "SUPERALCOHOLICS" drink poisonous alcohols because they have found ordinary alcoholic beverages too tame.

This class of alcoholics was described by four psychiatrists at Harvard Medical School, Boston, in the *Quarterly Journal of Studies on Alcohol* (Dec. 1957).

Superalcoholics differ from alcoholics because of an "unusual willingness" to drink poisonous alcohols. They have passed the beer and liquor stage and their taste now runs to such poisons as rubbing alcohol, witch hazel, antifreeze and sterno.

Nine of the superalcoholics were studied after being hospitalized during recovery from heavy drinking periods. Their personalities showed no common general pattern, but the pleasant, cooperative, overly polite manner in which they conducted themselves in the hospital was striking.

All of the superalcoholics were aware of the poisonous nature of the substances they had ingested, but all strongly denied they had any suicidal intent.

All said they preferred the toxic alcohols to ethyl alcohol because of the greater effects produced, and characterized themselves as individuals who neither felt nor expressed hostile impulses.

The drinkers fit the classification of "essential alcoholics," who have marked dependency and unconscious guilt, self-debasement and need for punishment, the psychiatrists report.

"We believe that for them ethyl alcohol (the type found in beverages)—which indeed these patients consumed in copious amounts—became too tame; their unconscious needs demanded severer measures, more complete obliteration, and a nearer tread toward the fearful and tantalizing brink between life and death," Drs. Jack Mendelson, Donald Wexler, P. Herbert Leiderman and Philip Solomon, Harvard Medical School, who report the research, conclude.

Science News Letter, January 18, 1958

PUBLIC HEALTH

Animal Thyroid Glands Indicate Fallout Danger

➤ THYROID GLANDS taken from livestock can be used to determine the amount of radioactive fallout in the area, Dr. Arthur H. Wolff, a senior veterinarian with the the U. S. Public Service, Washington, D. C., has found.

The glands are measured for radioactivity coming from iodine-131, one of the early products of a nuclear reaction and one which concentrates in the thyroid. It is picked up by the livestock as they graze in fields contaminated with fallout particles.

Radioactive thyroids, Dr. Wolff reports, may be caused not only by fallout from weapons tests but also by radioactive waste products from nuclear reactors.

Radioactive iodine was found in the thyroids of jackrabbits exposed to the stack discharge of radioactive wastes at the Hanford Atomic Products Operation in the state of Washington.

The actual exposure levels are small and are apparently harmless for livestock. They could probably be doubled without any ill effects.

Also, it is generally accepted that the amount of radioactivity in grazing animals is many times greater than that found in adult humans from the same area, but it should be pointed out that infants and children may be getting considerably more than adults through the radioactive milk.

The levels of radioactivity found in the animals occurred for the most part in the absence of significant increases in background gamma radiation, Dr. Wolff reports in *Public Health Reports* (Dec. 1957).

Thus, he concludes, for short periods the radioactivity in milk could approach peacetime permissible levels with little or no noticeable increase in background levels.

Science News Letter, January 18, 1958

RADIO ASTRONOMY

Large Radio Telescope Planned for Michigan

➤ A GIANT radio telescope, planned as the world's fourth largest of the steerable, saucer-shaped variety, will be built at the University of Michigan.

It will have a diameter of 85 feet to catch radio waves from the sun and from space, particularly the short wavelengths of approximately one inch.

The world's largest steerable radio telescope is the 250-foot instrument in Manchester, England, with another this size being built by the Australians. The U. S. is planning a 140-foot antenna at the National Radio Astronomy Observatory in Green Banks, W. Va.. An 85-foot instrument is also being erected there.

The University of Michigan's radio telescope will be built at Peach Mountain, 16 miles from Ann Arbor. Its reflecting surface will be solid aluminum, Fred T. Haddock, associate professor of astronomy and electrical engineering, said.

Science News Letter, January 18, 1958