

liver against tissue breakdown and the degenerative fibrous and fatty growth that constitute cirrhosis, and also something that promotes normal growth.

This dietary deficiency in milk was discussed by Edward J. Thacker of the staff of the U. S. Plant, Soil and Nutrition Laboratory, before the seventh annual meeting in Ithaca, N. Y., of the Laboratory's collaborators who work in state experiment stations and various federal departments.

Mr. Thacker has been keeping rabbits and guinea pigs on diets consisting of whole milk and skim milk powders, plus neces-

sary mineral elements. The animals fail to grow normally, and when they are autopsied, their livers prove to be badly damaged. Substituting dehydrated alfalfa for one-half the diet will prevent the development of cirrhosis. Less than that much alfalfa will enable the animals to grow, but then they will develop liver damage. It thus appears likely that the liver-protecting factor is distinct from the growth factor, but the case is not definitely proven. Thus far, neither factor has been isolated or identified.

Science News Letter, July 24, 1948

MEDICINE

Two-Front Attack Needed

Medical detectives must discover how the virus is spread and polio detectives must find the means to stop this virus criminal.

► MEDICAL DETECTIVE WORK along two fronts is needed for the conquest of infantile paralysis. This is clear from final reports made to the First International Poliomyelitis Conference in New York.

Scientists, thousands strong, are waging a good fight but no one really knows just how many polio viruses exist or what are the characteristics of each of the different strains of the polio virus family.

Within another six months research now under way may bring dramatic proof that some one avenue of germs is the prime means of the spread of the virus from one person to another. Is this avenue of infection an aerial route which the virus rides on the feet of flies? Or does the virus invade the fly's body as it does man's and travel in de luxe style with the fly furnishing food as well as transportation? Answers are coming to these questions, with their hint of a way to stop the spread of polio as yellow fever was stopped by discovery of the mosquito's part in its spread.

But if the answers are "noes," the polio detectives on another front may find the clues to stopping the virus criminal. A method for vaccinating against polio which is on a sounder basis than ever before was reported by Dr. Isabel Morgan of the Johns Hopkins School of Hygiene. Put the vaccine into the muscles, not just under the skin, and give such a big dose that the virus-fighting antibodies spill over from the blood to the central nervous system where the polio virus concentrates. This method will protect monkeys. Will it protect man?

The answers must come partly from the medical detectives who ferret out the secrets of what happens in the human body during the first hours of polio invasion. They must come partly from the polio detectives who trail and identify and characterize the various strains of polio viruses. This part of polio detective work is not as exciting

as it sounds. Dr. John R. Paul of Yale Medical School, one of the foremost polio detectives, calls it "dull" and "uninspiring." But, he said, "if we are to attempt to prepare specific vaccines which might be used to immunize man against this disease, we must clarify the strain situation."

Ferretting out the feeding habits of polio viruses is still another job for the medical detectives. Following this line, Dr. Raymond N. Bieter of the University of Minnesota has discovered chemicals which prevented paralysis or death in 90 out of every 100 mice. The polio virus, Dr. Bieter knew, has a special liking for nerve cells. Maybe, he reasoned, this is because the virus is hungry for some chemical in nerve cells. And if the virus enters the body through the throat and stomach and then goes to the nerves, why not, he wondered, feed it nerve cell chemicals while it is still in the stomach and stop it where it does no damage to human bodies?

It worked in mice. There is a hint that it is working in monkeys. If this proves true, the next step will be to try it in humans. But if it does not work in monkeys, the next step will be to try other chemicals the virus may be hungry for. Dr. Bieter is already on the trail of some of these. When he finds the right one we may have a chemical cure or preventive of polio.

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METEOROLOGY

Air Travel Made Safer by Central Weather Service

► A CENTRALIZED weather information bureau, now in full operation in Denver, is making a heavy contribution to both safety and comfort in airplane transportation. It is maintained by United Air Lines and is

located at Stapleton Airfield base.

With the aid of a huge weather wall map, meteorologists of the company review each morning the past weather conditions over the coast-to-coast and Hawaiian routes of the airline, study the present conditions, and make forecasts for the next 24 hours.

Meteorologists at other stations are consulted by telephone, and constant contact is maintained with the Denver U. S. Weather Bureau, whose chief meteorologist prepares special forecasts for the company. Airline weather forecasters along the system are aided in keeping posted on the nation's weather, minute by minute, by the company's 15,000 miles of private teletype lines and 7,600 miles of private telephone circuits. In addition to the centralized service, they keep in touch with the U. S. Weather Bureau and such Army, Air Force or Navy weather stations that may be in the vicinity.

By means of this central information center and the reports received by it the possibilities of conflicting predictions are ruled out. The information permits flight operators to cope with unusual weather problems, by rerouting planes around bad-weather regions or grounding them, and mile-by-mile information radioed to pilots warns them to prepare for, or dodge, bad weather ahead.

Science News Letter, July 24, 1948

CHEMISTRY

Ammonium Nitrate Safe When Properly Handled

► SAFETY in handling ammonium nitrate, the widely-used, white crystalline chemical compound that was behind the recent Texas City disaster, receives indirect consideration in a circular of the U. S. Bureau of Mines. Eighteen fires, serious explosions, and disasters involving ammonium nitrate have occurred since 1896.

The principal wartime use of ammonium nitrate was in explosives. Today's principal use is for fertilizer. Long used in limited quantities for this purpose, its use at the present time has greatly expanded. It can be employed with safety if proper precautions are taken.

The publication was prepared by G. S. Scott and R. L. Grant, chemists of the Pittsburgh office of the Bureau of Mines. Copies may be obtained free from that office. It deals with accidents and disasters, manufacture, preparation as a fertilizer, physical properties of pure ammonium nitrate, decomposition and oxidizing properties, spontaneous heating, and detonation.

The report includes a brief summary of published scientific information on ammonium nitrate and an up-to-date bibliography for reference. The publication states that while chemically pure ammonium nitrate does not decompose spontaneously at ordinary temperatures, it is an oxidizing

agent and, as such, may react with reducing materials, such as carbonaceous matter, certain metals, phosphorus and sulfur. With certain mixtures and the proper environment, spontaneous heating can occur at ordinary temperatures.

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CHEMISTRY

Find Way to Keep Powders Suspended in Liquids

► ELECTRICAL CHARGES on their particles enable certain soapy chemicals called detergents to prevent the curdling of paint, cosmetics and other commercial preparations, the American Chemical Society was told by two California scientists, Leonard Greiner of the U. S. Naval Ordnance Station, Inyokern, and Prof. Robert D. Vold of the University of Southern California, Los Angeles.

Many present-day commercial products, including medicines and toiletries as well as paints, consist of finely divided particles dispersed in liquids. The list of such products would grow, they said, if the factors governing the stability and efficient preparation of dispersions were better known. The investigations on which they reported were to discover the unknown factors.

Powder can be suspended indefinitely in a liquid, they stated, if a suspending agent is added to the mixture. They explained that the agents seem to charge the particles with electricity so that they repel each other. The molecules of the soapy chemicals used split into electrically charged particles when dissolved in water.

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CHEMISTRY

AEC Selling Chemicals In Radioactive Forms

► LATEST peacetime service of the nation's atomic energy program is the sale of chemicals tagged with radioactive elements, announced by the U. S. Atomic Energy Commission.

These chemicals are compounds such as certain acids and alcohols in which one of the elements is radioactive. The radioactive forms, called isotopes, of some chemical elements have been sold to researchers by the Atomic Energy Commission for two years. But the new tagged chemicals will speed studies where the radioactive elements are to be used in compounds.

One of the more important isotopes for research on living things, carbon with atomic weight of 14, is listed by the Commission as available now in several different compounds with more scheduled for production. Radioactive gold in the form of colloidal gold and aurothiosulphate is available for therapeutic use, it was announced.

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EXPLODING STAR—Recently discovered supernova, of the fifteenth magnitude when found, is shown here. Located in a spiral nebula known as NGC 6946, the arrow points to it. The supernova, 4,000,000 light years from the earth, was discovered by Dr. N. U. Mayall of the University of California's Lick Observatory. It was taken with the Carnegie 20-inch astrograph. (See SNL, July 17).

AERONAUTICS

Elasticity of Plane Wings

► THE elasticity of an airplane wing profoundly affects the stability and control of aircraft, the Institute of the Aeronautical Sciences was told at a meeting in Los Angeles, by S. I. Pai and W. R. Sears of Cornell University.

Far from being rigid structures, wings and other components deflect elastically under load, they said. Thus air loads on a wing in flight actually distort the wing, the distortion changing the air loads. The important effects on the ordinary straight wings are due to twisting; with the newer sweepback or sweepforward wings a bending under load changes the air loads appreciably.

Inertia loads, such as weights carried near the tips of the wings, tend to bend the wings downward. This has a stabilizing effect. Fuel tanks on wing tips, already carried on some planes, appear to be advantageous for this reason.

Science News Letter, July 24, 1948

Boundary Layer Control

► BOUNDARY layer control through the use of suction slots in airplane wings was found not "particularly attractive by comparison with drags known to be obtainable

with wings of sufficient smoothness," according to H. B. Dickinson of Lockheed Aircraft Corporation. The use of these suction slots has been recommended by others.

Boundary layers are relatively thin layers of air next to the wings and fuselage of a plane that cause considerable drag. The suction slots on the rear half of the wing surface removes part of the layer and, in theory at least, reduces the drag which comes when the smooth, or laminar flow, breaks into a turbulent flow.

Between 1941 and 1946, an investigation was conducted at Lockheed to determine whether it was advisable to attempt an early application of boundary layer control to an airplane project. The investigation was confined to the use of a single spanwise suction slot on the upper surface of a low-drag airfoil of conventional thickness and planform, Mr. Dickinson stated.

After extensive tests it appears that before the slot method is adopted, the simpler method of obtaining sufficient smoothness of actual wings should be solved. Thereafter, drag reduction by boundary layer control appears less promising, he said, and to make the added complication worthwhile would require capitalizing on all potential advantages.

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