VIROLOGY

Chemicals Give Vaccines Extra Punch for Flu, Polio

VACCINES with an added punch may be available as a result of new research.

Two harmless, simple chemicals are used as vaccine additives—one for influenza vaccine and the other for polio vaccine, a research team at Chas. Pfizer & Co., Inc., Terre Haute, Ind., told scientists at the Federation of American Societies for Experimental Biology meeting, Atlantic City, N. J.

So far, the additives have been used with flu vaccine tested on both animals and humans, and with the polio vaccine given only to guinea pigs. Clinical trials with standard inactivated polio vaccine plus the additive, sodium alginate, are now underway.

The animal studies have given "rather significant results," Dr. Allen F. Woodhour said. However, he would not comment on possible effects of the additive on the current polio vaccine program—such as cutting the number of recommended shots or raising the vaccine's effectiveness.

In tests with the influenza vaccine combined with hexadecyclamine (HDA), higher antibody levels were produced in the blood than with the standard commercial vaccine alone. It would be difficult to pinpoint the increased antibody level as a percentage increase in resistance to the flu, Dr. Woodhour said.

There was extreme variation in response to the vaccine combination, both among the animals tested and the approximately 60 persons given the vaccine.

This is the first time sodium alginate, added to the polio vaccine, has been used in a vaccine. Previously it had been widely used as a thickener in pills, ointments and other similar pharmaceutical products.

When injected under the skin or into muscle, Dr. Woodhour explained, the compound forms a jelly-like mass. It combines with the calcium in the blood serum and in the tissues. This mass is said to be slowly absorbed into the body without injury or irritation. Although the response is delayed about two weeks in comparison with standard vaccines, antibody formation is then higher than has been previously attainable.

Drs. Keith E. Jensen and Joel Warren, also with Chas. Pfizer & Co., were associated with Dr. Woodhour in the research.

Science News Letter, June 20, 1959

CHEMISTRY

Deionized Water Cools Aluminum Without Stain

A 96,000-GALLON tank of deionized water is being used to quench, or cool, pieces of hot aluminum without the risk of staining their surfaces.

The aluminum extrusions, which are loaded into a 70-foot-high heat-treating furnace and subjected to temperatures up to 980 degrees Fahrenheit, must be cooled quickly in a solution that will not stain the metal surface.

Ordinary water, containing a variety of potentially corrosive ions, cannot be used. Instead, deionized water must be used in the cooling process.

The special quench tank, 56 feet in depth, was built directly under the furnace at the Reynolds Metals Company plant, Grand Rapids, Mich., so that hot extrusions could be lowered into the bath in the shortest time.

Water deionized with Amberlite ion exchange resins, made by the Rohm & Haas Company, Philadelphia, is supplied to the tank from a multiple-bed ion exchange system.

This high-quality water is rated at three-parts-per-million dissolved solids and has an electrical resistance of 200,000 ohms. It protects the aluminum from stain by the quench, keeping the surface clean for further finishing.

Science News Letter, June 20, 1959

ORNITHOLOGY

Record Temperatures Of Torpid Poorwill

ONE BIRD, the poorwill, has a lazy time of it.

At a drop of the mercury it can go into a kind of suspended animation.

However, such a great temperature range will cause this reaction in the bird that it is impossible to tell if the inactivity is a response to heat as in estivation (summer hibernation) or cold as in hibernation.

A captive poorwill, a relative of the whip-poorwill, was subjected to repeated states of torpor or suspended animation, Thomas R. Howell and George A. Bartholomew of the department of zoology, University of California at Los Angeles, report in *The Condor* (May-June). Air temperatures ranging from a few degrees above freezing, 35.6 degrees Fahrenheit, to 66 degrees Fahrenheit would induce torpor. For the first time continuous records of the body temperature were taken as the bird entered this dormant state.

Results show that low environmental temperatures are not needed for torpor to begin, the scientists say. Since the air temperatures to which the bird responds are found at any season, "it seems probable that daily periods of torpor may be interspersed between longer periods of hibernation, the scientists pointed out. Just what causes torpor under natural conditions remains unknown.

A steady and rapid decline in body temperature and oxygen consumption characterizes entry into the torpid state. During torpor, body and air temperature are virtually the same. The bird "woke up" as both temperatures rose to about 59 degrees Fahrenheit, followed by strong shivering, increased respiration and a steep rise in body temperature and oxygen consumption. Normal body temperature of about 100 degrees Fahrenheit was then reached.

Scientists are interested in the processes of hibernation and related "slow downs" because of the information they provide on the metabolism of living organisms that do not hibernate.

Science News Letter, June 20, 1959

IN SCIENC

BIOCHEMISTRY

Alcohol Aids Growth in Germinating Pea Seeds

THAT ETHYL ALCOHOL stimulates growth in algae and seedlings is well known, but there is evidence now that germinating seedlings can use alcohol accumulation under airless or anaerobic conditions.

A comparatively large amount of alcohol accumulated after dried pea seeds had soaked in water for almost a day, two researchers report in *Nature* (June 6). After almost two days—when the radicle or tiny root tip had begun to emerge—the amount of alcohol was more than 500% less.

Preliminary examination of pea extracts during germination indicates that as the alcohol disappears there is a temporary increase in acetaldehyde content. There were also increases in acetic and citric acids.

Further experiments will be made to learn just what is happening in the germinating plant that makes metabolizing alcohol possible in air when it has accumulated under airless conditions, E. A. Cossins and E. R. Turner of the Chelsea College of Science and Technology report.

Science News Letter, June 20, 1959

GEOLOGY

Siberia and Alaska Once Joined by Land

ALASKA AND SIBERIA were linked by a land bridge as recently as 10,000 years ago, Dr. David M. Hopkins of the U. S. Geological Survey, Menlo Park, Calif., reports in *Science* (June 5).

From available evidence, he concludes that Bering Strait and the areas of the Bering and Chukchi Seas to the south and north of the strait were above sea level throughout most of the last 60,000,000 years. Although, about a million years ago, this land region sank and the water barrier preventing migration of plants, animals and men came into existence, the sinking was not permanent.

The repeated growth and disappearance of large glaciers during the last million years caused corresponding changes in sea level. The land bridge linking Alaska and Siberia was opened several times when the surface of the sea was considerably below its present level during the most intense glacial periods.

About 35,000 years ago, the land bridge was more than 1,000 miles in north-south width, Dr. Hopkins believes. His conclusions are based on studies of geological formations, marine sediments, ancient plant and animal remains, and radiocarbon dating of sea level positions.

Science News Letter, June 20, 1959

E FIELDS

ASTRONOMY

Invisible Auroras Linked To Unusual Radio Noises

INVISIBLE AURORAS that occur at the same times as unusual radio noises may be due to the earth's encountering a stream of particles thrown out by the sun.

Two Australian scientists report in *Nature* (June 6) that they sometimes found a minute-to-minute link between changes in radio noise level and the invisible auroral light intensity.

The auroras were spotted by an electronic device called a sky-scanning photometer on 53 nights between June and December, 1958. A comparison of the radio noise bursts at 4.6 kilocycles and night-glowing auroral records showed only a few times when both did not occur simultaneously.

Both the invisible auroras and radio noises tend to occur when the earth's magnectic field is greatly disturbed, they found.

The solar streams causing them could be either protons or electrons, Drs. R. A. Duncan and G. R. Ellis of the Commonwealth Scientific and Industrial Research Organization, Camden, New South Wales, suggest.

Science News Letter, June 20, 1959

GENETICS

Computers Improve Study of Gene Mutation

COMPUTERS CAN help biologists estimate just what the effects would be of increased mutation rates in man's genes.

An increase in the number and frequency of gene changes following exposure to X-rays and other irradiation has been observed in laboratory animals. Some scientists believe some human ills can be correlated to high or above-normal radiation levels.

We have reached a point now, where scientists should be able to decide if an increase in hereditary defects will follow a rise in mutation rate, Dr. Howard B. Newcombe of Atomic Energy of Canada, Ltd., Chalk River, Ontario, said.

There are two ways these defects are maintained in a population: by mutation, and by an increase in defects along with an increase in fertility in the healthy carriers of genes. In this second way, the gene losses which result from any reduced fertility in persons with ill effects would be balanced by the increased fertility of other persons. Frequency of mutation, such as induced by X-rays or other radiation, would not be important here.

"Our ignorance on this point represents the major source of uncertainty in estimating the consequences of an increase in mutation rate," Dr. Newcombe told scientists at a symposium on molecular genetics and human disease in Syracuse, N. Y.

Present-day computing equipment seems to be adequate for comparing the geneological information researchers are now gathering routinely in the form of marriage registrations. In addition to the need for new computers, the problem of studying human genetics and disease would be greatly aided by taking several steps: increase awareness of the hereditary causes of ill health as a public health problem; use vital statistics system to permit follow-up studies of individuals; make health information about individuals available especially where national health insurance programs are in effect, and improve methods of storing and getting back large amounts of records.

Science News Letter, June 20, 1959

MEDICINE

New Cortisone-Like Drug Eases Sunburn Discomfort

A CORTISONE-LIKE drug has been developed that may bring relief from pain and discomfort to many persons who have suffered severe sunburn reactions after initial or prolonged exposure to the summer sun.

Known as triamcinalone, the drug was administered orally every six hours to 14 severely sunburned persons by Drs. Milton M. Cahn and Edwin J. Levy of the University of Pennsylvania School of Medicine.

Nine of those treated obtained complete relief within 24 hours. Four others were more severe cases, with swelling of the face, hands and feet, and required 42 hours of therapy before complete relief was obtained.

The doctors reported that the drug caused no relapses or side effects, but cautioned against careless use because of the possible danger involved should some severe stress be experienced shortly afterward, such as emergency surgery. Tolerance to stress, such as experienced in surgery, is reduced considerably in some patients after receiving cortico-steroid therapy.

Science News Letter, June 20, 1959

ICHTHYOLOGY

Sea Cucumber May Be New Canned Food

SEA CUCUMBER chowder may soon be occupying a high place on the fish lover's menu.

The white meat of this fleshy relative of the starfish looks and tasts like excellent quality sliced clam meats, said John A. Dassow of the U.S. Bureau of Commercial Fisheries, Seattle, Wash.

In the North Pacific, sea cucumbers may be gathered at any season. However, native Alaskans say their quality is poor during warmer weather. Preparation of the tube-shaped animal is simple, the scientists reported.

After it is cleaned and eviscerated—by cutting off one or both ends, splitting down the side, and scraping and washing—the thin white strips of meat can be cooked and used as a clam substitute.

The sea cucumber can also be canned, frozen, or dried and used as is trepang or dried sea cucumber of the Orient.

Science News Letter, June 20, 1959

ENGINEERING

Largest Ball Bearing Measures 14 Feet

THE LARGEST precision ball bearing ever made weighs 14,600 pounds, measures nearly 14 feet in diameter, and will support a million pounds.

It contains 88 four-inch balls and will rotate at ten revolutions per minute during a minimum operating life of ten years.

Soon to be installed in the supporting system of a Nike-Zeus radar system, the bearing was built by the Kaydon Engineering Corporation of Muskegon, Mich.

Five different rings make up the bearing, reported the International Nickel Company, Inc., in New York. An upper and lower outer race (track or groove), an upper and lower inner race, and a data gear ring that indicates angular position of the radar antenna.

The rings were forged from nickel-chromium-molybdenum alloy steel, which has good hardenability and machinability. It also provides excellent wear resistance in the hardened condition, high strength and impact resistance even at low temperatures.

As demands for big radar systems continue, even larger bearings will be needed. Already, a 60-foot-diameter bearing is being designed with replacement segments. Diameters of 100 feet are probable in the future.

Science News Letter, June 20, 1959

PUBLIC HEALTH

Researchers Recommend Annual Polio Boosters

AN ANNUAL BOOSTER shot of polio vaccine, and possibly two such shots, is recommended by a research team at Michael Reese Hospital, Chicago.

A five-year study involving 4,000 children who had received a Salk-type polio vaccine showed that, within one to three years after getting their first three shots, the levels of immunity drop.

After a booster, however, the immunity levels reached a higher level and fell less than after the primary immunization. After a second booster "there was even better response," the researchers report in the *Journal of the American Medical Association* (June 6).

It seems possible, they explain, that once the polio antibodies, or polio virus fighters, are produced, they will be present within the body at very low levels for life. Actual virus exposure or booster shots will "remind" the body to produce more of these virus fighters.

Thus a person who has once produced antibodies is probably still immune. However, it is preferable to have a detectable amount of antibodies present in the blood stream and the booster shot helps provide them, the team reports.

The research was carried out by Drs. Albert M. Wolf, Howard J. Shaughnessy, James W. Chapman and Ruth E. Church, and Martha Janota and Mildred Moore.

Science News Letter, June 20, 1959