

MEDICINE

Need Live-Virus Vaccine To Stop Spread of Polio

► LIVE POLIO virus vaccine, administered by mouth, is potentially more effective in wiping out polio than the presently used Salk vaccine shots, Dr. Albert B. Sabin, University of Cincinnati College of Medicine, reported to the fourth International Poliomyelitis Congress meeting in Geneva, Switzerland.

The only way to wipe out polio is to make the human intestinal tract immune to reinfection, he said.

The live vaccine to do this can be made from suitably attenuated or de-vitalized strains of polio virus. It is free from allergic reactions, cheap and simple to use for mass application.

"The real issue that remains to be resolved concerns its safety, safety not only as regards the viruses that are initially swallowed but also of those that may be excreted in changed form and spread to others," Dr. Sabin said.

The Salk killed-virus method of preventing polio is about 75% effective but tests have shown it does not alter the intestinal tract's susceptibility to infection and does not affect the spread of polio in the community.

Just waiting to see how long killed-virus vaccine immunity will last might deprive many people of the protection that earlier trials of orally-administered live-virus vaccine might provide.

But the decision is "not an easy one," Dr. Sabin admitted. Tests of the live-virus vaccine would have to be done on tens or hundreds of thousands of people to see if the vaccine was as safe in practice as it is in theory. This involves a "certain risk that is difficult to calculate."

A trial would be justified in some areas, he believes. Countries in which the use of the killed-virus vaccine is impractical or the polio viruses are already known to be spreading extensively in the population might make the trial.

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PUBLIC SAFETY

Air's Atomic Debris Shows Seasonal Fuel Use

► SENSITIVE TESTING of the air's atomic debris since the first H-bomb explosion shows the difference in the amount of fuel Americans use in winter and summer, two scientists at the Naval Research Laboratory have found.

Studies of radioactive carbon 14, formed when neutrons released in thermonuclear detonations react with atmospheric nitrogen, revealed the increased burning of fossil fuels during winter.

R. L. Patterson Jr. and I. H. Blifford Jr., the NRL investigators, also found scientists of the future will have to watch their step when they try to date objects from this decade by the radioactive carbon 14 method: results can be expected to be incorrect because of the carbon added to the atmos-

phere since 1952 when the first H-bomb was exploded.

One way of dating once-living objects is to measure the amount of radioactive carbon 14 they contain. This carbon is assumed to have formed at a steady rate by the action of cosmic rays on atmospheric nitrogen, and it is measured by extremely sensitive methods.

Mr. Patterson and Mr. Blifford wanted to find out if there was any detectable increase in the air's carbon 14 due to hydrogen bombs: Using as one standard the carbon from tree rings formed in a cedar in Yosemite Valley from 1900 to 1905, they measured 7.73 counts per minute.

Since 1952, the count has increased to about eight each minute, they report in *Science* (July 5). Although this increase is very small, it is detectable and very important to carbon 14 measurements.

The extra amount means the assumption of a steady rate of carbon 14 formation does not hold true for any living objects after 1952. Since the fuel burned during winter comes from fossils of a long-ago age, it does not add any carbon 14 to the atmosphere but dilutes the amount already there. That is the reason the measuring standard was chosen from early this century, before fossil fuels, such as coal and oil, were burned in great quantities.

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BACTERIOLOGY

Screw-Cap Bottles Pose TB Threat in Britain

► UNSCREWING the cap on a culture bottle used to diagnose tuberculosis may be all it takes to accidentally infect laboratory technicians with the disease, Dr. A. J. H. Tomlinson, Public Health Laboratory Service, County Hall, London, England, reports in the *British Medical Journal* (July 6).

Screw-capped bottles for bacterial cultures are commonly used in routine diagnostic practices in laboratories in England. When active TB germs are grown in them, many times the inside rim of the bottle becomes contaminated with a thin film of bacterial growth.

When the bottle is opened, the film of broth culture is broken and some of the resulting droplets are small enough to form aerosols, or fine mists, which dissipate in the air.

The particles of bacterial material released are extremely small and could quite easily be inhaled and thus carried into the many tiny recesses of the lungs, Dr. Tomlinson said.

Tests of the action were made with culture bottles containing other less dangerous bacteria and showed that the majority of bottles with infected rims produced a bacterial cloud on opening. However, bottles with apparently dry rims were rarely infected.

A possible safeguard is the use of a plastic-like film over the mouth of the bottle. The bottle can then be opened by piercing the plastic with a hot wire and resealing the bottle with another piece of plastic.

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IN SCIENCE

FOOD TECHNOLOGY

French Fried Sweet Potatoes Made

► FRENCH FRIED sweet potatoes, developed by the U. S. Department of Agriculture's research division in Philadelphia, are described as a "savory high-quality food product" combining a new flavor appeal with frozen french fry cooking and serving convenience.

USDA researchers also tested deep-fried sweet potato chips, julienne strips and diced potatoes. They report that after five months storage, in the dark at room temperature, these potential snack foods were still crisp and flavorful.

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FORESTRY

Ultrasonics Detects Flaws in Trees and Wood

► ULTRASONICS may soon be used to inspect trees for hidden diseases, J. S. Waid and M. J. Woodman, Merlewood Research Station, Lancashire, England, report in *Nature* (July 6).

The ultrasonic equipment is already in use to detect flaws in wood, and further developments may enable foresters to use it for spotting fungus diseases that slowly destroy good timber.

For flaw detection, both sides of the wood to be tested are smoothed and coated with a coupling agent, such as petroleum jelly, to insure good contact between the wood and the probes of the machine.

The high frequency sound waves generated by the equipment are then passed through the wood and any flaws present reduce the amount of ultrasonic energy penetrating the bad area.

Since bark has been found to stop the ultrasonic waves, it must first be stripped off the sampling area if testing is done across the grain of the wood.

Even slight defects in the wood cause a considerable reduction in the amount of ultrasonic energy measured, and no transmission at all occurred through a two-inch piece of red pine infected with dry rot. In sound seasoned beech, however, the ultrasonics could be transmitted for four feet.

The most important development of this new technique would be to reduce the economic losses of timber that result from disease, the authors report.

Valuable trees are often lost because such fungal infections as heart and butt rots go undetected for many years. If the disease were noticed early on a plantation, a change in the future management of the trees could be made. The loss on imported and stored timber could also be reduced with a speedy method of detecting the decay in bulk timber.

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CE FIELDS

PSYCHOLOGY

Parent May Make Child Delinquent

➤ WHEN a child becomes a delinquent, it may be because unconsciously the parents, and particularly the mother, forced him into this behavior.

This is indicated in a report to *Behavioral Science* (July) by Drs. Claire Russell and W. M. S. Russell of the department of zoology, University College, London, England.

Most parents are surprised by behavior in their children which is directly dictated by their own conscious or unconscious wishes.

Everything depends upon the relationship between the two parents themselves—the happier they are together, the better for their offspring.

But when the dominance-submission relation between parents is one in which, on both sides, fear and rage are uneasily balanced, each parent may displace or redirect both attack and revulsion onto the child.

Each parent will attempt to interpose the child between himself or herself and the partner and to use him as a weapon as well as a scapegoat in their continual conflict.

When a parent seeks to dominate a child either by rigid control or smothering "affection," the parent forces upon the child a rigid pattern of behavior and prevents him from developing independence. The behavior of the child in this case may not look at all like submission. It may take the form of compulsive rebelliousness.

It may even seem to be domination of the parent as in the spoiled child who grows up to be a delinquent.

The bad behavior of the child then becomes compulsive and removed from control by the intelligence. He responds to all authority with rebelliousness and aggression.

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PHYSIOLOGY

Controlled "Climate" For Studying Body

➤ A SEALED-OFF chamber for studying the body processes of human beings kept in a controlled "climate" for long periods of time is now ready for full-scale operation at the National Institute of Arthritis and Metabolic Diseases of the U. S. Public Health Service in Bethesda, Md.

The "metabolic chamber" has been designed to give previously unavailable information about how humans use food, air and water in the process of living.

The person under observation will live in the chamber for periods up to several days, while sensitive instruments record the amount of air he breathes and the precise

amounts of food and liquids he ingests. Expired air as well as other body wastes will be recaptured and continuously analyzed.

The chamber is large enough to permit the subject to move around, work at a desk, or exercise on a treadmill, and it contains a comfortable bed, commode and refrigerator.

The chamber allows scientists to study the total energy balance of an active human living under comparatively normal conditions. Answers to fundamental questions of energy metabolism that are not now well understood may be found.

High on the list of experimental subjects will be persons suffering from overweight and other conditions in which various tissues are gained or lost from the body.

Researchers hope the new chamber may provide a solution to the age-old problem of why some heavy eaters remain slender, while some light eaters gain too much weight.

The studies will be carried out under the supervision of Dr. G. Donald Whedon, chief of the metabolic diseases section of the Institute.

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TECHNOLOGY

Super Fuel for Air Force Being Produced

➤ HIGH-ENERGY "super" fuels that increase jet aircraft ranges up to 50% and eliminate high altitude engine failures have gone into semi-commercial production for the Air Force, it has been revealed.

A spokesman for Olin Mathieson Chemical Corporation, developer and producer of the new chemical fuels, said small quantities of the fuels already have been shipped to the Air Force from a semi-commercial plant at Niagara Falls, N. Y. A plant designed for full-scale production is expected to be in operation within 20 months.

Dr. L. K. Herndon, head of the high-energy fuels operation, said the compounds are based on derivatives of boron, a non-metallic element previously known chiefly as the main ingredient of borax washing compounds and boric acid. He said the new fuels meet all Air Force requirements for ultra high energy as well as for easy and safe handling features.

Brig. Gen. C. H. Mitchell, deputy production director of the Air Force's procurement and production directorate, described the delivery of the first high energy fuels as a break-through signifying greater strength for the United States. Speaking for the Air Force, Gen. Mitchell said the fuels would enable jet aircraft engines to function efficiently at high altitudes where low wind resistance would make flying faster.

The new "exotic fuels" are planned for use in aircraft and are not being adapted to automobile or other surface transportation use. Olin Mathieson executive vice president W. C. Foster has said that he expects the fuels to be the forerunners of what will amount to a \$1,000,000,000 industry within 10 years.

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BIOLOGY

Cockroaches May Be Spreading Polio

➤ COCKROACHES may be spreading polio by harboring the polio virus in their bodies and then transferring it to men's food, Drs. Robert G. Fischer, University of North Dakota, Grand Forks, and Jerome T. Syverton, University of Minnesota, Minneapolis, have found.

Polio, as well as encephalomyelitis or sleeping sickness, is most probably transmitted by mouth from food, water or other substances that have been contaminated by human waste. However, the persistence of the virus as well as other indications also point to its being carried by insects, the scientists report.

Flies have already been incriminated as possible polio carriers. Cockroaches may be equally dangerous since in many parts of the world they are more closely associated with man's food and waste than are flies.

To test the roach's ability to carry virus, they were strapped to corks with cellulose tape and force fed quantities of active Coxsackie virus from a blunt needled hypodermic syringe.

The researchers found that for as long as 20 days after a single meal of the deadly virus the cockroaches retained enough of it to paralyze and kill test mice later exposed to the virus.

Infected cockroaches may either carry the disease themselves from host to host, or they might be eaten by wild mice which later excrete the viruses which are viable, the investigators report in the *Proceedings of the Society for Experimental Biology and Medicine* (June).

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TECHNOLOGY

Automotive Gas Turbines Ready for Military Use

➤ GAS TURBINES are now "practical and feasible" for use in heavy duty and military vehicles, engineers William A. Turunen, Robert Schilling and E. L. Baugh of General Motors told the Society of Automotive Engineers during its meeting in Atlantic City, N. J.

The goal was to create a powerplant that could haul heavier loads at higher speeds with lower maintenance, and it seems to have been reached with the development of the automotive gas turbine. In tests of gas turbine capabilities, as contrasted with standard truck engine performance, the gas turbine showed a 27.5% improvement in acceleration tests and a 17% improvement in ability to take a grade.

At top speed on the highway, the turbine engine was found to operate with fuel costs "the same or less than those of production piston engines," the engineers reported.

Since the gas turbine operates much like a jet engine, special alloys are needed for the "hot" parts of the powerplant. This requirement is the main drawback to production, but is yielding rapidly to developments in new metals.

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