

BIOLOGY

Enzyme Aids Healing

Scientists have found a new substance, a plant enzyme, that can speed treatment and healing of burned tissue and enables the surgeon to make necessary skin grafts.

► AN ENZYME taken from the juice of a fig tree now speeds the treatment of burned human skin, one of mankind's most painful and dangerous injuries.

Named ficin, the enzyme literally dissolves away the damaged tissue and can completely clean a third-degree burn in three to five days, Dr. James F. Connell, director of burn research, St. Vincent's Hospital, New York, told SCIENCE SERVICE.

It has been successfully used on over 300 burn patients during the last three years.

The process of clearing away the burned tissue is called debridement and must be completed as soon after the injury as possible so that the damaged area will be ready for skin grafts.

The enzyme is applied to the burned area either as a paste or solution. It works best on the most severe burns.

It does the job by dissolving the damaged skin protein and can debride a third-degree burn faster than a deep second-degree burn, Dr. Connell said.

With only partially damaged tissue, the enzyme treatment takes up to 12 days.

Ficin is the best of 25 or 30 enzymes which have been tried experimentally in the past few years but scientists hope to find one which works even faster.

While the damaged tissue exists around the wound, infection is always a problem and enzyme-treated patients receive continuous doses of antibiotics to keep infection down before the wound is closed with skin grafts.

An ideal treatment would be an enzyme which could do the debridement, or removal of damaged skin, within 24 to 48 hours, leaving the burned area cleared of all damaged tissue and ready for grafting.

Another enzyme which may be able to do this has just passed its animal tests at Walter Reed Army Institute of Research, Washington, and will soon be tried on humans.

In guinea pigs, the enzyme does the job within 24 to 48 hours. If it works as well

on humans, it may turn out to be close to the ideal burn treatment.

Technically known as *clostridium histolyticum*, the enzyme is harvested from a type of bacteria similar to those which cause gas gangrene. After 24 to 48 hours contact with the protein-dissolving enzyme, the damaged tissue can be gently wiped away and the area is ready for grafting.

But extensive trials are needed to see if the enzyme will be safe and effective for human burns.

Maggots were used to debride burns during the World War I period, although the treatment was not too popular in this country for obvious reasons. The maggots were sterilized and placed in a packing around the burn. They excreted a chemical substance called urea which dissolved the tissue in much the same way the enzymes do.

Surgery is now the standard method of debriding burns. It accomplishes the job completely, but it is not without danger. A series of blood transfusions is frequently needed and the procedure adds even more trauma to the injured area.

For mass casualty treatment, surgery would be impossible but a quick and effective enzyme treatment could be lifesaving.

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MEDICINE

Polio Immunity Increases Without Salk Vaccine

► EVEN WITHOUT SALK shots, people are naturally becoming more and more immune to polio, Drs. Robert L. Vought, Bristol Laboratories, Inc., Syracuse, N. Y., and Morris Greenberg, New York City Department of Health, report in the *Journal of the American Medical Association* (July 6).

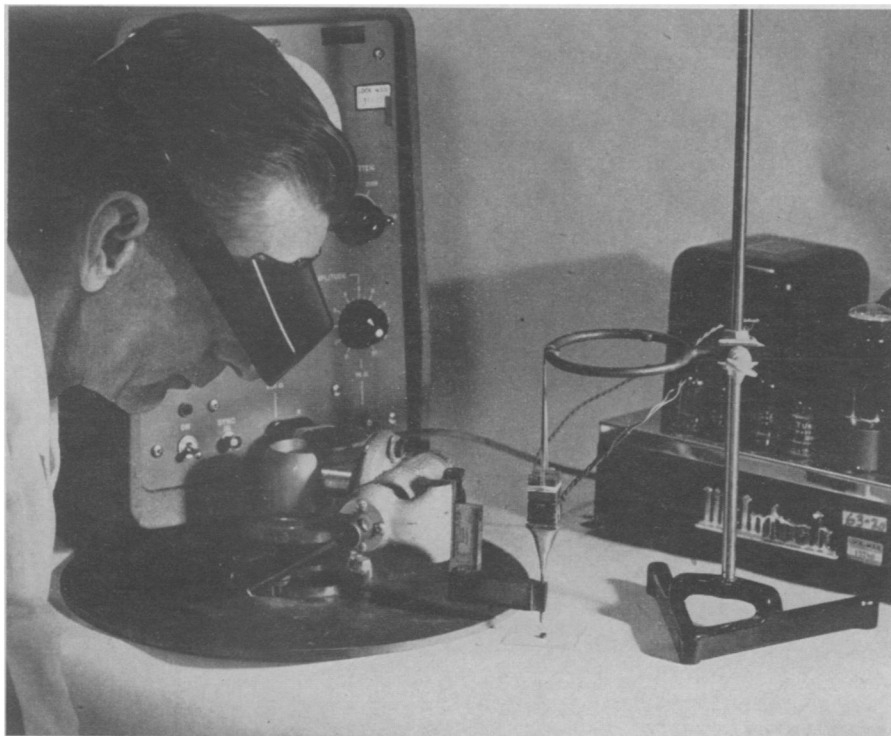
Natural immunization against polio occurs when the virus is spread from the gastrointestinal or respiratory tract of either patients or carriers to other people. These people, in turn, become carriers and usually develop immunity without developing active cases of the disease.

Since 1915 the polio death rates among successive generations of children under 15 years in New York City, whose statistics were used for the study, has been reduced 75% to 90%, the authors report. There were no artificial methods of immunization such as Salk vaccine until 1954, so the reduction in death rate must have come from increasing natural immunization and better medical care and sanitation.

On the basis of their study which included the years 1915 through 1944, the scientists predict a further drop of another 75% to 90% by 1969. The Salk vaccine may cause an even greater drop than this, but even if it does not, the outlook for future generations as a result of natural immunity is "quite encouraging."

Exactly how natural immunity develops in a population is not known, although it is known that, as more people are exposed to the virus, more develop natural immunity and fewer develop actual cases of polio.

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SILENT SOUND WAVES—Sound waves almost twice as high in frequency as human ears can detect 28,000 cycles a second, are being used by Lockheed Missile Systems scientists to bore precise holes in very hard ferrite materials. The magnetic drill is operated by the ultrasonic frequency put out by an oscillator. Arthur S. Knapp, research laboratory analyst at Sunnyvale, Calif., wears magnifying glasses to watch the drill make a hole measuring only five-thousandths of an inch. The ferrites are made into magnetic memory cores for electronic computers and data storage devices.