

Pure Venom Saves Victims

Pure bee venom extracted from frozen insects appears to be 10,000 times more potent than other solutions in immunizing allergic persons—By Barbara J. Culliton

► **STUNNED BEES** and wasps are being stuffed nightly into garbage cans, nests and all, and carried off to be frozen so that their deadly venom can be extracted by scientists.

At night, when the stinging insects are sluggish from the cold, students and technicians at the Pennsylvania State University, University Park, hunt for bumblebees, white-faced hornets, and tree and ground nesting yellow jackets. Their victims are stunned by a spray of carbon dioxide from a fire extinguisher and taken to research laboratories where entomologists pull their stingers and extract the poison that can be fatal to some highly sensitive persons.

Small, injected doses of pure venom in solution can then be given to these allergic victims to protect them against the possibility of being stung.

Dr. Allen W. Benton, assistant professor of entomology at Penn State, told *SCIENCE SERVICE* he hopes a protective dose of pure venom will be a

more powerful safeguard than desensitizing solutions now in use, which are made from the ground-up bodies of whole insects.

Preliminary studies on honeybee venom show it to be 10,000 times more potent than "whole body" solutions. An application for a license to use pure venom antigen is now before the U.S. Food and Drug Administration, Dr. Benton reported.

Similar antigens against wasps and hornets are still in the experimental stage, he said, but clinical tests of wasp venom on humans will begin soon.

Yellow jackets are among the most dangerous of the stinging insects. From 10,000 to 15,000 of them are needed to yield a single gram of pure venom, yet that amount can be used to treat 2,000 to 3,000 persons.

Possible anti-cancer properties of the venom will also be studied. Fifteenth century folklore from France and Germany and from India tells of

insect venom healing tumors, but no scientific evidence has been found in support. In testing snake venoms, scientists have found some indications of anticarcinogenic effects in a few instances.

Wasp venom from Pennsylvania and bee venom collected last summer by Dr. Benton in the Far East will both be tested for the first time.

Hunting and collecting bees in the Far East posed some real challenges, he said, because of the veneration many people feel for the insects. In Thailand, for example, bees are believed to bring good luck if they nest on the south, east or west side of a home and no one is permitted to disturb them. Bees living on the north side, however, are shown no respect by the Thai people, so Dr. Benton was free to take them.

MEDICINE

Anesthetic to Be Given By Veins, Not Lungs

IN THE FUTURE, patients on the operating table may get their oxygen pure, undiluted by anesthetic gas. A way has been found to introduce the gas directly into the blood stream by means of silicone rubber tubing.

Dr. Judah Folkman, a surgeon at Boston City Hospital and professor at Harvard Medical School, developed the new method of administering anesthesia when he discovered by accident that such gases diffuse readily through silicone rubber.

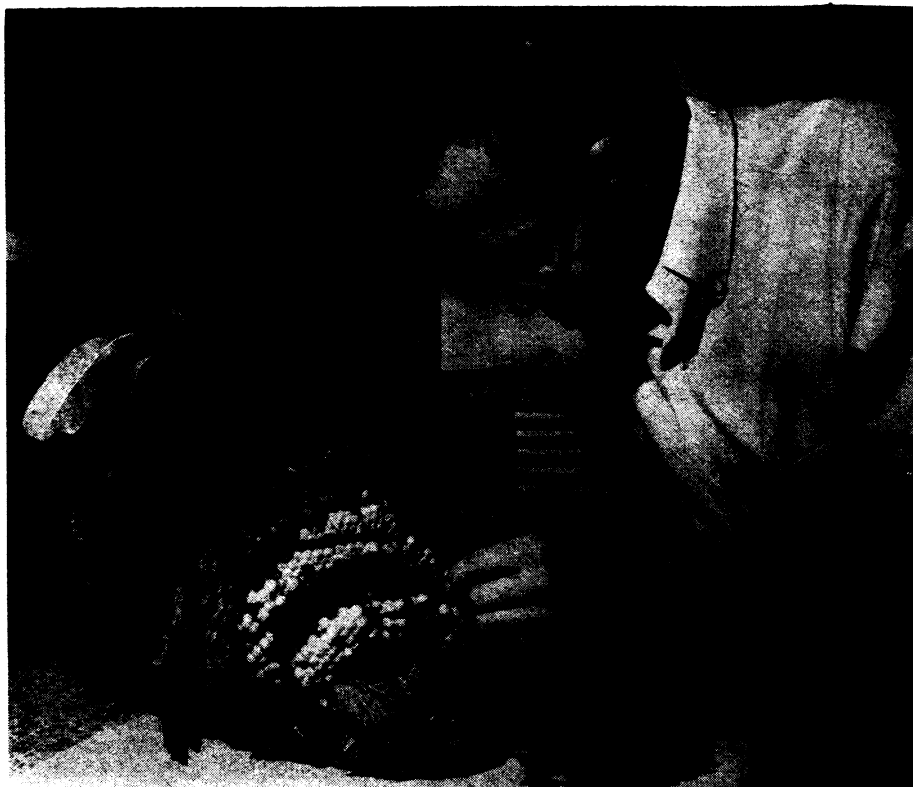
Physicians may be able to give anesthetics through veins instead of lungs, in the same way they now give transfusions.

Dr. Folkman noted, however, that he has not yet been able to induce deep anesthesia with a single intravenous tube. The tube's surface must be quite large before it diffuses enough gas.

One way to increase surface without making the tube too fat is to dot it with hundreds of tiny nipples, Dr. Folkman said. This increases surface area by about 50%. He is also working on the gases' diffusion properties, and said an improved method should be ready in a year or so.

If anesthesia can be given through the veins, more potent gases might be administered more safely, Dr. Folkman said. At the same time, patients will be able to breathe up to 100% oxygen.

Patients suffering from burns and kidney failure could profit from the intravenous method now. Kidney patients already have a silicone rubber tube leading from artery to vein, allowing their blood to be cleaned periodically. Dr. Folkman found that this loop, longer than the single intravenous tube, would diffuse enough anesthetic to induce deep sleep. The same artery-vein coil in an arm might be useful for burned patients, he suggested in *Science*, 154:148, 1966.



Pennsylvania State University

'VENOM NEST'—This white-faced hornets' nest is being dissected by laboratory technician Richard Heckman so that its frozen insects can be taken out and their venom extracted.