

BIOLOGY—PHYSICS

Extract Antigens From Germs With Intense Sound Waves

New Method Designed to Prevent Injury to Delicate Substances Which Produce Antibodies in Our Tissues

SQUEEZING and shaking substances valuable in medicine out of cultures of disease germs by means of intense sound waves is the biological feat that has been accomplished by two University of Pennsylvania scientists, Dr. Leslie A. Chambers and Dr. Earl W. Flosdorf.

The substances they obtain belong to the class known as antigens. They are poisons secreted within the germs' bodies. Injected into the human body in suitably small quantities, they may be used in provoking the formation, by our own tissues, of opposing substances known as antibodies, which defeat the germs if they attack later on. Or the antigens may be injected into the bodies of animals, from which blood is later withdrawn for making immune serums for medical use.

Present methods of obtaining antigens involve heating, addition of chemicals, or other treatments that injure or destroy certain of the more sensitively composed antigens. This is what the new method of Drs. Chambers and Flosdorf is designed to avoid. Its treatment of the germs is strictly physical or mechanical, and it can be conducted at a low temperature.

The foundation of their apparatus is a magnetized metal tube, usually made of nickel, which is caused to vibrate extremely rapidly by flowing an alternating electrical current around it in coils. The sound waves thus set up may be either exceedingly shrill, or even so high-pitched as to be in the ultrasonic range, beyond reach of the human ear. In either case, they are made highly intense.

Over the upper end of the metal tube a glass tube is fitted, with a leak-tight rubber joint. Into the chamber thus formed a culture fluid containing billions of germs is poured. Then the current is turned on and the vibrations started. After the treatment has been continued long enough to get out most of the antigens (and incidentally, to shatter most of the germs), the process is stopped, and the liquid is first centrifuged and then passed through a fine porcelain filter, to remove all debris and any of the germs that may have survived the treatment.

The antigens are in the clear, germ-free liquid that has passed through the filters. Some types of these antigens are so sensitive and unstable that they will spoil if kept for only a couple of hours at temperatures a little above freezing. However, if the liquid is frozen at once and the water evaporated out of the ice, the solid, dried residue, now consisting of concentrated antigens, can be kept for a year or more, the experimenters state.

Drs. Chambers and Flosdorf have obtained U. S. patent (No. 2,230,997) on their apparatus and process, on which they have assigned their rights to the University of Pennsylvania.

Science News Letter, March 1, 1941

ANTHROPOLOGY

Wasp Nests 300 Years Old Found In Indian Skulls

WASP nests built in vacant skulls where brains of Powhatan's Indian tribesmen had been, are the latest revelation of Indian life 300 years ago in the Virginia region of Pocahontas, Powhatan, and Capt. John Smith. Discovery of the wasp nests, which shed light on customs of this historic tribe, was announced by Dr. T. Dale Stewart, Smithsonian Institution anthropologist, to the Anthropological Society of Washington.

So well preserved are several of the 300-year-old nests in the Indian skulls that entomologists here have identified the species of mud dauber wasp that built the homes, and even spied out fragments of larvae inside, Dr. Stewart stated.

The nests confirm scientific belief that the Virginia Indians of the town of Patowomeke held dual funeral rites, first placing the dead high on platforms in a death house, and later holding another ceremony to bury the dry bones. Only in such a sequence, Dr. Stewart reasons, could the wasps have had their chance to build homes inside skulls



WASP APARTMENT

One of the 300-year-old wasp nests discovered inside skulls of Virginia Indians. The skull above shows the sort of entrance hole used by these wasps in their strange apartments.