

PUBLIC HEALTH

New Antivenin Developed

Venoms from four dominant species of "pit-viper" snakes used to make serum that is effective against bites from all other snakes of *Crotalidae* family, including rattlesnakes.

► DEVELOPMENT OF an antivenin which is effective against the venoms of all snakes of the *Crotalidae*, or "pit viper," families throughout the world was announced at the first International Conference on Animal Venoms held with the American Association for the Advancement of Science meeting in Berkeley, Calif.

Crotalidae include rattlesnakes, copperheads and water moccasins, or cottonmouth snakes.

The new antiserum, or antivenin, against these snakes' venoms was announced by Dr. B. R. Criley of the Wyeth Laboratories, Marietta, Pa. At the same time, a more accurate method for testing the potency of this antsnakebite serum was announced by Drs. W. C. Gingrich and J. C. Hohenadel, also of Wyeth Laboratories.

Heretofore, Dr. Criley said, it has been considered axiomatic that horse serums prepared for treatment of poisonous snakebite are highly specific; and that it is impossible to neutralize the venom of one species with a serum produced against the venom of another species, even those belonging to the same genus and family.

Earlier methods of producing antivenin (a horse serum), for treatment of bites by the pit vipers of the United States only, employed venoms from 10 or 11 different species, and required at least 28 to 36 weeks for production of the serum.

In 1947, research was started at the Wyeth biological laboratories that led to identification of the four venoms (those of the Texas, Florida and tropical rattlers, and the fer-de-lance) containing the basic antigens present in the venoms of all species of the family *Crotalidae* throughout the world.

These include not only the pit vipers of the United States, but the tropical rattler, the tropical moccasin (cantil), bushmaster, fer-de-lance and similar species, native to Central and South America; and also the habu and mamushi, native to certain islands of the Pacific and parts of the Asiatic mainland.

Thus it has been proved that a serum produced with the venoms of the four dominant species of the family *Crotalidae* will also neutralize the venoms of all minor species of the same family.

Improvements in the method of immunizing horses for production of antivenin have shortened the schedule and increased the yield of highly potent serum.

An improved method for refinement of antivenin has been developed by which the majority of factors responsible for serum reactions have been eliminated.

The new method of standardizing the

new antivenin determines its potency in terms of killing power of the venom, when injected into mice of a certain size, that a stated dose of the serum will counteract.

Heretofore, the criterion for testing and standardizing potency of antivenin has been the weight of venom a stated amount of antiserum would neutralize.

Since the virulence of snake venoms varies from species to species and from individual to individual within species, sometimes as much as 80%, an extensive investigation, using various test animals, was carried out to develop the more accurate testing method.

An enzyme called hyaluronidase, known also as the "spreading factor," increases the effectiveness of antsnakebite serum when the two are given together, Dr. Paul Boquet, chief of laboratories of the Pasteur Institute, Paris, reported on the basis of his studies with dogs and guinea pigs.

Two modern so-called wonder drugs, cortisone and ACTH, have been tried in treatment of snakebite. Neither is effective by itself when antivenin is not used, Drs. M. W. Allam, D. Weiner and F. D. W. Lukens of the University of Pennsylvania, Philadelphia, and Drs. A. L. Wallace and R. Sticka of the Drug Houses of Australia Limited, Rozelle, Australia, reported. The Philadelphia group worked with cortisone.

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AERONAUTICS

Jet Engine Tested for Britain's Tiny "Gnat"

► THE ORPHEUS engine for the tiny British Gnat jet fighter is now being tested and it is even lighter than expected.

The first Gnat with the new engine is scheduled to undergo flight tests this summer. Development of the light, short-range interceptor is being watched with interest by aircraft designers all over the world. It marks a new trend in fighter development.

United States jets have in general become continually heavier. More instruments, mechanical aids and safety devices have been added to each successive model. Experts point out that for each additional pound of equipment added to a plane sometimes as much as 15 pounds of support structure must also be added.

Some British designers believe that there is an important need for light fighters, especially, they say, since some European countries cannot afford to produce the heavy, expensive American models.

The Gnat is said to weigh 6,000 pounds,

about one-third as much as the F-86 Sabre Jet, the United States' fighter used extensively in Korea. The newer F-100 Super Sabre weighs about 27,000 pounds.

The wingspan of the Gnat is 20 feet, 8 inches as opposed to 36 feet for the Super Sabre, and it is only 28 feet, 9 inches long while the Super Sabre is 45 feet in length.

The new Bristol Orpheus engine was designed for a 5,000-pound thrust and was originally expected to weigh 850 pounds.

Performance data on the Gnat are not yet available, but it is known that the two-ton Midget, a prototype of the Gnat with one-third its thrust, has already broken through the sound barrier.

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