SCIENCE NEWS®
A Science Service Publication
Vol. 110/December 4, 1976/No. 23
Incorporating Science News Letter

COVER: The nerve cell terminal contains an impressive stock of spherical membranes, called vesicles, which contain a fixed amount of neurotransmitter. The vesicle contents are released into the space between the nerve cell and the adjacent muscle cell (lower portion of micrograph). This electron micrograph shows a rapidly frozen slice of frog nerve and muscle. Magnification × 84,000. See p. 363. (Electron micrograph: John Heuser, University of California, San Francisco)

Editorial and Business Offices
1719 N Street, N.W.
Washington, D.C. 20036

Subscription Department
231 West Center Street
Marion, Ohio 43302

Subscription rate: Until 12/31/76: 1 yr., $10; 2 yrs., $18; 3 yrs., $25. Afterward: 1 yr., $12.50; 2 yrs., $22; 3 yrs., $30. (Add $2 a year for Canada and Mexico, $3 for all other countries.) Change of address: Four to six weeks' notice is required. Please state exactly how magazine is to be addressed. Include zip code.

Printed in U.S.A. Second class postage paid at Washington, D.C. Title registered as trademark U.S. and Canadian Patent Offices.

Published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N.W., Washington, D.C. 20036. (202-785-2255)TWX 710-822-9433 SCIEN NEWS.

LETTERS

Most potent venoms

In reviewing a recent issue of your publication (SN: 9/25/76, p. 204) under the heading Zoology I came across the following: "It (black widow spider venom) has been found to be six times more potent than the venom of the cobra and 15 times more potent than the venom of the prairie rattler, making it the most dangerous of all animal poisons." The venom of the black widow may indeed rank as stated with the venom of the cobra and prairie rattler but if the information I have is correct it is in no way the most lethal of animal toxins.

In the three-volume *Venomous Animals and Their Venoms,* edited by Wolfgang Bücherl, Eleanor Buckley and Venancio Deulofeu, the black widow spider *(Latrodectus m. mactans)* is listed as having a venom which is less potent than some other arachnids. In experiments involving mice weighing 20 grams, the following data was gathered as to the average amount of venom from respective animals required to kill the 20 gram mice.

Spider	Intravenous	Subcutaneous
Latrodectus m. mactans	0.110 mg	0.200 mg
Latrodectus curacaviensis	0.170 mg	0.240 mg
Lycosa erythrognatha	0.080 mg	1.250 mg
Phoneutria nigriventer	0.006 mg	0.0134 mg
Trechona venosa	0.030 mg	0.070 mg

According to this information the black widow's venom is not nearly as lethal as some of the other spiders found throughout the world. As a matter of information, the average venom yield for a *L. m. mactans* is 0.60 mg (dry) while the *P. nigriventer* yields 1.25 mg on the average. The maximum amounts of venom (dry) extracted from the animals was 1.3 mg and 8.0 mg respectively.

Other venomous animals that would vie for the position of having a more potent venom drop-for-drop could be some of the scorpions, *i.e., Tityus, Centruroides, Leiurus* and *Buthacus.* The sea wasp jellyfish, *Chironex fleckeri,* has a highly potent venom. And, two sea snakes, *Enhydrina schistosa* and *Microcephalophis gracilis,* have a venom that proves lethal to 20-gram mice when only 2.5 μg is injected into the mouse.

Finally, the poison from the Dendrobatid and Phyllobatid frogs is considered to be the most lethal of all animal secretions unless one includes botulism caused by the spore forming bacterium *Clostridium botulinum.*

Thank you for your attention on this matter that is an ardent avocation of mine.

J. Dwayne Atwell
Director Instructional Materials
Osborn School District No. 8
Phoenix, Ariz.

Foxbat and Soviet air strength

SCIENCE NEWS is in no way out of line in discussing military aircraft technology (SN: 10/9/76, p. 231), but I suggest you do your readers a disservice in printing Congressman Carr's theories without argument.

While many of us are shocked by the lack of safety equipment and the low level of electronic sophistication in Soviet aircraft (and spacecraft!) we must not be blinded by U.S. gadgetry to the fact that Soviet equipment is adequate to perform the mission. In the case of the MiG-25 Foxbat, the mission is to intercept intruding U.S. fighters and bombers and knock them down, and the Foxbat carries a not too sophisticated nor expensive but fairly accurate missile with a range of 37 kilometers for just this purpose.

Carr rightly claims the U.S. SR-71 reconnaissance plane does a far better job than the Foxbat. But the SR-71 was designed to be an unarmed recce plane, and we have only 18 in the inventory. The Soviets have hundreds of operational Foxbats and are producing more.

The Foxbat may be inferior to our 15-year-old F4 Phantom. In any case, the MiG-23 Flogger is superior to the Phantom, and the Soviets have 1,000 of these and are said to be building up to 4,000 more.

Carr does well to point out that the U.S. will shortly have an air superiority fighter in the F-16. I note that the Soviet MiG-29 now in development looks like it might be pretty similar to the F-16. This is a good place to mention that the underengineered, low-technology Soviet planes cost a good deal less than U.S. counterparts.

Let me say that I believe U.S. machines have the technological edge in any one-on-one combat situation, and we have better stuff in the cockpit. But the Soviets have adequate machines, and a lot more of them than we do. The point to be made again and again is that a few good planes and excellent pilots are no match for lots of inexpensive, adequate machines and fair pilots—especially when the other guy has the option, and the reputation of striking first and without warning. It is unfortunate that remarks such as Congressman Carr's contribute to a comfortable and totally illusory sense of military security that is totally without foundation.

John Van Devender
Pittsburgh, Pa.