

life sciences

PHARMACOLOGY

Scorpion stings and heart diseases

The effectiveness of certain drugs in blocking the effects of scorpion venom on the hearts of dogs may have clinical application in the treatment of patients with acute heart attacks.

About seven percent of the victims of scorpion sting die of heart failure and pulmonary edema. In research work on the effects of the sting of the yellow scorpion on dogs, Prof. Karl Braun of Hadassah-Hebrew University in Jerusalem has demonstrated that the damage occurring in the heart and the lungs is mainly due to the overactivity of hormones known as catecholamines.

A study of the electrocardiographic changes in dogs shows that sometimes these resemble the myocardial infarction pattern, although these changes may be temporary or fleeting. The similarity of these electrocardiographic patterns to those occurring in human beings points out the possible importance of catecholamines in causing heart attack.

Experiments with dogs have shown that certain drugs, if given immediately after the sting, are effective in blocking the formation of catecholamines and thus in preventing the marked alterations in the cardiovascular system.

ARTIFICIAL SWEETENERS

FDA cautious on cyclamates

In what is billed as an interim report on the safety of artificial sweeteners, the Food and Drug Administration is holding to its previous position that up to five grams of cyclamates a day represent no hazard to healthy adults. But it also cautions against unrestricted use. Five grams is equivalent to the cyclamates in about 100 Sucaryl tablets or three quarts of diet beverages. The safe limit for children is two 12-ounce bottles of pop a day.

Evidence that cyclamate sweeteners cause tissue changes in the liver and other organs, break chromosomes and interfere with the action of certain drugs, including antibiotics and diabetic drugs (SN: 10/26/68, p. 428), is currently under investigation and may lead FDA to a change of posture when the cyclamate review is completed. Commissioner Herbert L. Ley suggests that the agency may eventually lower its recommended limit to three and a half grams a day for a 154-pound adult.

ENTOMOLOGY

DDT poisoning explained

The insecticide DDT, known to cause fatal nervous system breakdowns in wildlife, does so by invading the synapses or tiny gaps between nerve cells, thus blocking transmission of impulses.

After five years of research, Dr. Fumio Matsumura of the University of Wisconsin in Madison has traced the movement of DDT in the nervous systems of rats, pinpointing synapses as its final destination. He finds that DDT destroys these neural impulse relay stations. A chemical and ion imbalance then occurs in nerve cells,

leaving them in a perpetual state of excitement, unable to transmit impulses.

Understanding of the mechanism of DDT poisoning—death from nervous breakdown—may shed light on less serious side effects of its build-up in wildlife and in man. "By knowing the basic mechanism, one can explore such side effects of DDT as reproductive failure in bird populations," he reports.

ENDOCRINOLOGY

Male prisoners get female hormones

Female hormone treatment of male prisoners convicted of sexual offenses is likely to become standard practice in British prisons following experiments at Wormwood Scrubs in London.

Forty prisoners at the jail underwent a painless 10-minute operation under local anesthetic in which a small pill of synthetic female hormone is inserted under the skin of the buttocks.

Most of the 40 men treated had been convicted of offenses against children.

Observations over the two years of the experiment have shown a marked decline in patients' abnormal tendencies.

The hormone, estradiol, has a neutralizing effect on the male hormones. If it is carefully controlled, it has no adverse effect on the man's potency.

The drug may be taken orally, but when the pellet is implanted under the skin the effects last for three months and allow better control over the patient. Prison physicians say this is no longer an experimental approach to sex offenders but can be considered positive treatment.

PALEONTOLOGY

First fossil lamprey described

Modern lampreys, successful eel-like creatures that have made the news by invading the Great Lakes in large numbers, are one of two survivors of the class Agnatha, or jawless fishes, the earliest group of vertebrates. But because their skeleton is mostly soft cartilage there has not been a fossil record of lampreys by which to chart their evolution.

Now six fossil specimens of a new species in a new genus of the same family as the modern lamprey have been found in an Illinois coal mine. David Bardack of the University of Illinois in Chicago and Rainer Zangerl of Chicago's Field Museum of Natural History report in the Dec. 13 *SCIENCE* that the six specimens of *Mayomyzon pieckoensis*, were recovered from shales dating from the middle Pennsylvanian period, some 240 million years ago. The specimens are just dark stains outlining body parts.

The researchers say *M. pieckoensis* is a basically modern lamprey, though much smaller than the living forms. They say absence of hagfish characteristics indicates that the two groups had a separate ancestry possibly as far back as the early Paleozoic, 450 million years ago. Lampreys may have evolved from the larval phase of ostracoderms, jawless fishes that are the oldest vertebrates of which there is a fossil record.