

programme aimed at broadening the interests of 4-H Club leaders and instructing them in activities which could be carried out as individual or group projects in each of the 4-H Councils of the province. Mr. Fyfe reported that both boys and girls showed considerable interest in the

trap-line and other aspects of the natural history programme. If some of these young people maintain the interest in this phase of nature study we can look forward to getting an increasing number of specimens and more information—and to having more naturalists among us.

Deer

by Doug Gilroy, Regina



Deer against the sky.

—Photo by Doug Gilroy

What thrills one more than to see two or three white-tailed deer go bounding across an open field or to see a mule deer race up the side of a hill, then stop and pose for a moment against the sky, then disappear over the other side?

We got our accompanying picture one day last spring. The deer here are mule deer. It might be noted that there are no signs of antlers on the bucks. This is because it

was past shedding time.

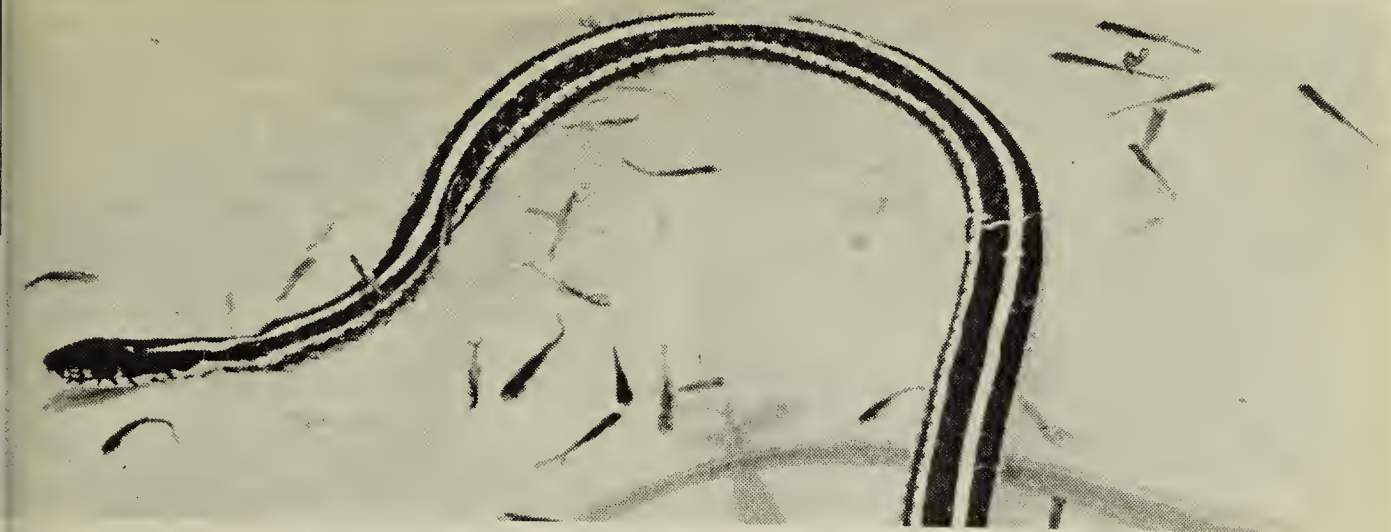
When a white-tail is flushed he usually high-tails it away as fast as he possibly can, not stopping for a backward look. But a mule deer is different; he is curious, and usually after a short spurt will pause to look back to see just what kind of creature intruded on his hiding place. This habit often proves his undoing for the hunter is quick to take advantage of it.

Garter Snakes Eating Minnows

by FRANCES McKAY and JOYCE DEW
Saskatchewan Museum of Natural History

Our children's program at the museum this summer attracted many children, among them Bob Kerr who sat down one morning to read *In Ponds and Stream* by Margaret Waring Buck. He read that "The garter snake is sometimes found near

water. It eats frogs, toads, salamanders, crayfish and minnows as well as insects, worms and mice. Bob then insisted that he try minnows on our captive garter snake. One of these was a Plains Garter Snake (*Thamnophis radix*) and the



Garter snake with minnows. Note snake's open mouth.

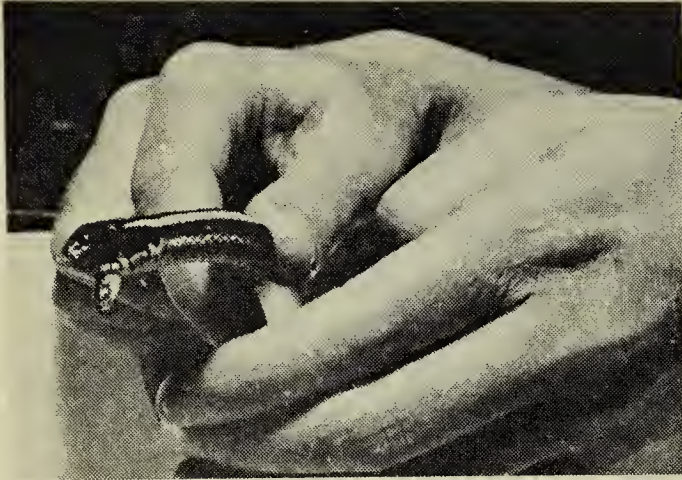
other is a Red-sided Garter Snake (*Thamnophis sirtalis parietalis*); both were about 30 inches long and had been in captivity for four months.

The minnows, caught in Wascana Creek, averaged an inch and a half in length. They were put in a goldfish bowl which was placed in the snakes' cage. We then picked up and held the snakes over the top of the bowl in order to direct their attention to the minnows. One of them crawled into the bowl and started swimming and feeding almost immediately, but it took several minutes before the other became interested. Feeding was accomplished by what appeared to be random movements; sometimes the snakes would literally bump into their prey. This seemingly non-directional search appeared to be a general "fishing" behavior which was evidently a reaction to the presence of water and minnows. Both snakes darted through the water first in one direction and then the other with their mouths held wide open. Most of the time when each snake had its mouth open it would swim along the surface of the water with its lower jaw submerged. Although it swam mostly with its mouth open, it did sometimes swim with closed mouth. The darting tongue which is typical of the behavior of a snake travelling about on the ground was seen only occasionally when the snake was under water.

Upon catching the minnows, the snake would jerk its head to the side, bringing it in quite close to its neck, then jerk it from side to side. A snake was observed to go through this performance once after it just missed catching a minnow. To eat the minnows which they caught, the snakes would usually

raise their heads above the water or come entirely out of it. Less frequently, they consumed minnows while completely submerged. The minnow was seldom swallowed in a single gulp. Usually it was caught broadside, and the snake would work its jaw sideways over the minnow, first one end of the minnow disappearing and then the other. Sometimes several minnows were taken in quick succession. At other times as much as ten minutes would elapse before a snake would be successful in catching a minnow. In the interval it would swim through the water in an apparent search for food.

Each of the three times we observed snakes eating minnows the larger ones were caught first or nearly first. The shorter minnows were only one-half an inch long and were probably more difficult to manipulate. At times, the open-mouth behavior seemed to indicate general excitement or interest on the snake's part. This was particularly noticeable after a long duration of "fishing" attempts when we were photographing the snakes. After three-quarters of an hour and repeated attempts to get them in focus with their mouths open, we noticed the snakes were showing lack of interest in food, crawling out of the pan, and swimming with mouths closed. At that point we dangled minnows in front of them. Then fingers were substituted for minnows and one snake suddenly reacted with mouth open and swam more actively than it had been doing. It was so active that the finger was quickly withdrawn! The snake darted quickly from side to side with mouth open out of the water as well as while under the water.



Garter snake eating minnow.

One of the times when the snakes were fed minnows, the fish bowl was placed in the cage at two in the afternoon and the snakes were put into the water. They were observed for a few minutes and then left in the water. At five p.m. they were still as active as at two. In fact, they were both in the bowl completely submerged. Judging from the amount of water in the sand outside the bowl and the amount of sand in the bowl, they had been in and out of the water all afternoon. There were ten of the 40 minnows left (mostly small ones) which would indicate that each snake ate an average of 15 minnows. We offered a few of the remaining minnows to the snakes and they were most cooperative, opening their mouths when they saw our fingers approaching. When we took the fish bowl out

of their cage the snakes appeared to be quite excited and darted around in their water dish apparently searching for more minnows. The snakes ate both dead and live minnows. The dead minnows were not taken first although occasionally a dead minnow would be eaten when live minnows were still available. Garter snakes evidently will vary their diet to include other than live food.

During the summer the snakes were on a diet of earthworms and frogs, but now are apparently doing well on a diet of raw beef, minnows and other live animals being less readily available. To get the snake to eat raw meat, it was first held and wiggled in front of the snake's nose without it paying any attention to it for a minute or two. Then the snake showed interest by raising its head toward the meat. As the meat was moved gradually back and forth in front of the snake it followed with its head and forepart of its body. After the snake's interest was thus aroused the meat was dropped in front of it. The meat fell on the bottom of the cage. With one dash the snake had it in its mouth and proceeded to swallow it. All that was necessary subsequently to interest the snake in pieces of meat was to hold a piece in front of it. The snake would grab the meat and eat it.

How Bright the Stars?

by JOHN HODGES, Regina Astronomical Society

In previous articles, we have described the overall motion of the heavens throughout the year and the grouping of the stars in constellations. We have thus shown how to tell when certain constellations will be visible and how to find any particular star we might be looking for. Another problem of the amateur astronomer is how to tell or compare the brightness of the stars. This is not as difficult as it seems.

Most phenomena in the sky are measured by brightness—the nearness of an approaching planet or a comet, a meteor's behaviour as it streaks across the sky, the outlining of a constellation. The measure of this brightness is called magnitude.

The system now in use to measure

a star's brightness had an interesting origin. Hipparchus, the greatest of the Greek astronomers, made two tremendously important contributions to astronomy. He catalogued 1,000 stars, and he divided them into groups according to their brightness. Six divisions or classes of brilliance were established, the first twenty bright stars being described as first magnitude and the faintest that were visible to the naked eye as sixth magnitude. Note that the smaller the number, the brighter the star. Ptolemy, who succeeded Hipparchus, modified the original catalogue, but little realized that his efforts were to remain the standard reference for some 1,500 years. His catalogue of stars was used by Columbus to di-