

of the sea. The warmer regions are their regular home. In the United States it is found in Virginia, Georgia, Florida, Texas, Arizona, New Mexico, and Arkansas. No mention is made of its being found further north than Virginia and Arkansas. Only one species inhabits North America, but there are several varieties, distinguished chiefly by the arrangement of the colored bands. This snake is ordinarily found in the ground in sweet potato fields. The question naturally arises, How came it so far north? Has it ever been found in this state before? Was it carried here and escaped? I am rather inclined to the latter view. If, however, it has been found in this state by other parties, then this view is evidently erroneous.

The specimen under consideration is about 25 inches long. It has more than 200 gastrostoges, which are entire, and the urostoges bifid. The anal plate is also bifid. Dr. Jordan, in his "Manual," speaks of it as being entire. This is evidently an exception to the rule, and this plate is, therefore, somewhat variable. The snake has seventeen bands of crimson, bordered by yellow. The occipital band is yellow and the bands on the tail also have no red. It has no loreal plate, but in another species it is present. It has two fangs in the upper jaw, which are hollow, and on the front side there is a permanent groove; back of these fangs are small teeth. The *Elaps fulvius* is classed among the venomous by Dr. Jordan. If any one has found another specimen in the state I shall be glad to learn of it.

SOME OBSERVATIONS ON HELODERMA SUSPECTUM. By D. A. OWEN, Moore's Hill College.

About the middle of last May the museum of Franklin College came into possession of a fine specimen of *Heloderma suspectum* or "Gila monster," from Sacaton, Arizona. This is one of the largest of lizards, and the only one in America reputed venomous.

The specimen received is eighteen inches long from the tip of his snout to the end of his tail, which is six inches long and of an uniform diameter of about one inch and a half until within a short distance of the end, where it terminates in a blunt point.

The body is beautifully marked by black and flesh colored tubercular scales, much resembling Indian bead work. Its habits are very sluggish,

and not infrequently whole days are spent in sleeping. This is almost universally the case during very cloudy weather. Its food has consisted of raw eggs, of which three or four are consumed in a week. Sometimes it will eat an egg each day for two or three days, and then will touch nothing for nearly a week. The method of taking this food is by suction, assisted by sliding back and forth its flat, forked tongue. When the eggs were given without first breaking the parts, it was very difficult to swallow, the food would be forced out through the nostrils and some time would be spent holding the head elevated so that gravity might force it down the throat.

Other foods were offered, but in no case were they touched.

Although its native home is in that arid region where rain seldom falls in abundance, it showed a special fondness for water. It would frequently lie in a pan of water during the whole day. At times, when the appetite made no demands for the food, he would frequently crawl into the pan, as if he preferred to take it by absorption.

In breathing, there seemed to be a full expansion of the lungs every 50 or 60 seconds. The air is then expelled, as it seems, in a kind of pulsations. These pulsations are seen on each side of the neck and vary from fifteen to thirty per minute. But during the torpid state, which began about the middle of October, there appears to be no full expansion of the chest, but respiration is conducted wholly by this pulsation. If, however, the animal be disturbed, the air is immediately forced out of the lungs with a sound very much resembling a deep sigh.

The moulting began about the last of July or the first of August, and was not completed until the last of September. The skin was removed in pieces, beginning about the middle of the body.

In regard to the nature of the vermin and the fatality of the bite there is little to offer that is new. The result of experiments, however, seem to cast some doubt upon the idea formerly held that the action of the poison was very rapid.

The first animal that was bitten was the common tiger salamander. In this case there was no more deleterious effect than would have occurred from the bite of any other animal. The same thing was true with the next, which was a common toad. In both of these cases, after the bite, the heloderma frothed considerably at the mouth and refused to make the second bite.

The next animal bitten was a rat. After the rat had been bitten two or

three times, with seemingly no perceptible effects, it was taken out and placed in a cage with a rattlesnake, where it was bitten twice, and within the space of two hours was dead. A second rat, after an absence of a few days, was put in with the heloderma and was bitten three times; once upon the fore leg, and once upon the tail, and again through the lower jaw. The first two bites occurred before nine o'clock in the morning, the third about one in the afternoon. At four o'clock the same day the rat seemed all right, with the exception of being cowed and having a desire to get as far from the lizard as possible. The next morning, upon observation, the rat was found dead, and when picked up a greenish fluid ran out of its mouth.

The heloderma, when undisturbed, is a harmless individual, and at no time was its biting voluntary. But when disturbed he elevated his head with mouth open, giving forth the aspirate sound of *hah*, and if at this time any thing is placed within his open mouth, the jaws immediately close upon it. The biting is simply holding fast for a few minutes. There are no fangs in the upper jaw, as in the rattlesnake, and if there be any poison it must be from the ordinary saliva and depends upon the degree of irritation of the animal.

Judging from the actions of the two rats bitten, one by the snake and the other by the lizard, we believe the poison in the two reptiles acts differently. From the death struggles of the one bitten by the rattlesnake there appears to be a paralysis of the respiratory organs, while from the stupor which appeared to take hold of the other, we judge in that case to be a paralysis of the circulatory organs.

SOME OBSERVATIONS ON PHOTOMICROGRAPHY. By D. W. DENNIS.

CONTRIBUTIONS TO A KNOWLEDGE OF THE GRAIN TOXOPTERA (TOXOPTERA GRAMINUM). By F. M. WEBSTER.