

SOME OBSERVATIONS ON THE PYTHONS.

W. HENRY SHEAK, Philadelphia.

Most of my study has been given to birds and mammals, but I have had some exceptional opportunities to observe the great serpents, especially the pythons. I spent five years with the New York Zoölogical Company, better known as the Edwards Animal Show, as naturalist and lecturer. We always had a number of these monster reptiles in our collection, and sometimes as many as sixteen, none of them less than twelve feet in length, and some of them more than thirty. The following notes were made during those years.

The ability of snakes to perform feats of swallowing is astounding. I once knew a small boa, probably the young of *Boa constrictor* scarcely four feet in length, and with a head no larger than a man's thumb, to swallow a full-grown pigeon. We put the pigeon in the cage at night, thinking that an Indian python (*Python molurus*), seven or eight feet long, would take it, but a great swelling in the body of the little boa next morning showed what had become of the bird. As no snake chews or rends his prey, we knew that it passed his head and throat entire. The enlargement did not disappear for a week.

"Long Tom", a giant Reticulated python (*Python reticulatus*), fed on a pig weighing forty-five pounds. We wanted to get some photographs of the monster reptile taking large prey, so the pig was put in the den alive; but as his prey had been killed for him in captivity, the snake got frightened when the pig began to move about and squeal, and backed away. When the pig was killed and he smelled the warm blood, he took the animal at once and in twenty-five minutes it had disappeared. The pig is, however, an easy object to swallow, compared to a dense pelage of fur or feathers.

For two or three days the stomach was enlarged to almost the size of a beer keg, but on the third day the swelling began to diminish, and by the end of the fifth the body had returned to its normal diameter. Contrary to common belief, these big snakes will generally soon learn to take their prey after it has been killed. We usually fed them chickens or rabbits, killed, but still warm. We have, however, fed them with cold-storage rabbits that were killed in Australia. Miss Grace Clark, a young woman with much experience with big snakes in shows, tells me that she once had a snake that would take a chicken after it was dressed and cut into pieces, receiving the pieces one at a time. One evening we wanted to feed a very large pigeon to a small Indian python. In order to save him the trouble of working over the shoulders, we cut off the wings. After gorging the bird, we offered him the wings, which he took and swallowed.

The python which swallowed the pig was received from Carl Hagenbeck of Hamburg, Germany, in July, 1907. Mr. Hagenbeck had a photograph of the reptile in the act of swallowing an Indian antelope (*Antelope cervicapra*) weighing over ninety pounds. He had another Reticulated python which swallowed a ninety-seven pound ibex. A python in the Cincinnati Zoölogical Gardens swallowed a goat weighing forty-two pounds. All of the goat that passed intact were the horns, the hoofs, and a piece of sash rope four feet long that had been attached to his neck.

We had a big Reticulated python which passed the hoofs of a pig. They were shown to Dr. W. T. Hornaday, the Director of the New York Zoölogical Park, who identified them as the hoofs of the Bornean wild pig (*Sus barbatus*), of about forty pounds weight. A ship's captain in bringing over a large Reticulated python, found in the excrement the quills of a Javan porcupine, lying in the same relative position they occupied on the animal's body. The reptile must have begun at the head, extending the coils backward over the body, and pressing the quills down horizontally in their natural state of rest. Evidently, this is a species of prey a snake would not disgorge.

Our small snakes feed largely on frogs, toads, and fish; the anacondas feed extensively on fish; king snakes and king cobras eat other species of snakes; but I have never known a boa or python to take a cold-blooded animal. We often keep small snakes and iguanas with the boas and pythons, but they never take any notice of them. In a state of nature their prey consists largely of small deer and antelopes, lambs, kids, pigs, other mammals weighing less than a hundred pounds, and any bird that may be large enough to attract their attention. That their prey does not always submit without a fight is shown from the number of broken ribs that are found in the skeletons of these reptiles.

We had an artistically mounted skeleton of a twenty-two foot Reticulated python, in which there were thirty-seven ribs that showed well marked fractures, and a number of others that showed indications of fracture. Some of them had been broken two and even three times. In one, the ends had slipped past each other for about a half inch, and the two sides were knitted together. In one place there were five fractured ribs in succession. A peculiar feature about these broken ribs is the fact that they always occur toward the posterior quarters of the snake. It is probable that the animal responsible for these fractures is the Bornean wild pig. Doubtless the reptile usually seizes the pig near the head and throws his coils about the shoulders. The posterior limbs are thus left free, and with these he fights desperately till life is crushed out, frequently, as is plainly evident, doing serious damage to his assailant.

In conformity to their attenuated form, snakes have a large number of vertebrae and ribs. A peculiarity of the skeleton is that there are but two cervical vertebrae. The atlas and axis, or first and second bones of the spinal column, next to the head, bear no ribs; but they start with the third vertebra. Neither are there any lumbar or sacral vertebrae. In the Reticulated python there are 361 vertebrae. Of these, 2 are cervical, 37 caudal, and 322 dorsal. The caudal vertebrae all bear transverse processes, the proximal ones long and broad, diminishing gradually toward the tip of the tail, but they do not disappear, even in the last distal vertebra. It may be that these are but ribs ankylosed to the vertebrae. It is sometimes difficult to distinguish just where the ribs end and the transverse processes begin. This is true of the Indian python. As already intimated, there are 322 pairs of ribs. However, it is highly probable, at least possible, that this number will not hold constant. Even in man there may be thirteen, eleven, or as few as nine pairs. At least one human skeleton has been known with twelve ribs on one side and thirteen on the other.

Likewise the teeth of the python are numerous. In the upper jaw there is a row of teeth in the maxillary, and a second row, set at considerable distance inside the first and imbedded in, or rather ankylosed to, the palatine bones. In the lower jaw there is but one row of teeth, that of the inferior maxillary, but it is really double, as there is a line of tiny teeth just inside the larger ones. The teeth are all acutely conical in form, smooth, and with no cavities, depressions, or ridges, and set so that they point toward the back of the mouth. They serve merely for catching and holding the prey, not for mastication. As there are no particles of decaying food on the teeth to be carried into the wound and produce septacemia, a bite from one of these monsters usually heals quickly. None of the teeth are set in alveoli, but merely ankylosed to the outside of the bone, and as the ankylosed surface is small, it follows that the attachment is not very solid. Consequently it is not unusual for the teeth to break off when the reptile is feeding. We often found them on the floor of the cage after a feeding.

In seeking his prey, the python depends much more on his sense of smell than on that of sight. It is always dangerous to go near these big snakes with the smell of any kind of bird or mammal on the hands or clothing. When they are hungry and scent their natural food, they will strike at the first thing they see moving. They will even strike at inanimate objects which have come in touch with their natural prey. One evening we were feeding a big python. For some reason he had dropped the prey, and to get him to return to the chicken, I picked up a woolen duster which the janitor had been using to dust the glass cases, and pushed it towards his head. Instantly he struck and seized the duster in his teeth. His jaws had to be pried open to make him let go. Under similar circumstances a python in the Philadelphia Zoological Garden a few years ago, seized and swallowed a blanket. After retaining it for two days, he disgorged the article, rolled into a compact wad.

The sense of taste in the serpents is very keen. If chickens are kept in a dirty box, these reptiles will refuse to feed on them. If a python bites into the crop of a chicken containing bad-tasting matter, he will drop the chicken. To test the sensibilities of the serpents, we once put a stale egg in with a Black snake. This species (*Boscanium constrictor*) is very fond of eggs, but no sooner had the shell broken in his stomach than the little fellow commenced vomiting, and continued until the stomach was completely evacuated.

It is sometimes said that the snakes have no eyelids. In fact the eyelids are fused in a transparent skin over the eyes. When they shed they shed the skin from over the eyes as well as that from other parts of the body. Just before the old skin is removed, it dies, becomes dull in color and opaque in texture, so that for several days before shedding a snake is almost blind. There is a milky fluid between the dying epidermis and the newly forming skin beneath. It is a strange fact, but during the last few hours this fluid disappears and the skin over the eyes partially clears. As soon as the old skin is removed, the snake is able to see again as well as ever. But it sometimes happens, in captivity, at least, that the skin over the eyes is not removed when that from other parts of the body is shed, and as a consequence the snake remains blind. I have known this to happen for two

successive sheddings and at the third all three skins be removed, when the reptile's vision was restored.

It is a common belief that snakes are so plentiful in India that one can scarcely walk about without stepping on them. This is erroneous. It is possible to live for considerable periods of time in that country without so much as catching a glimpse of a snake. And this is especially true when we confine our references to the big pythons. Dr. Hornaday spent two years hunting in India and Borneo, and he declares he never saw but one python, and that was a small one. The pythons are timid and shy, and lie coiled among the foliage of trees or shrubs, or in the dense grass on the ground. They never attack man or the large animals so long as they are unmolested.