AN INAUGURAL DISSERTATION, ON
The Coluber or Rattlesnake
SUBMITTED TO THE
PRESIDENT, BOARD OF TRUSTEES, AND MEDICAL FACULTY
OF THE
University of Nashville,
FOR THE DEGREE OF
DOCTOR OF MEDICINE.
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Orotalus (from κρόαλον, a rattle). The rattlesnake is a genus of venomous serpents abounding in various parts of the American continent. There are three species, the characters of which are well ascertained, C. durissus, C. horridus, and C. milianis. A fourth, C. casavella, has been recently found in Brazil. The serpent tribe are distinguished from all other animals by a peculiar character, in which their figure, motion, and habits, so repulsive and disgusting, form a striking contrast to the beautiful and variegated colours with which their skin is studded, adding, if possible, to their subtle and venomous appearance; while their crawling motion strikingly exemplifies the desir of the Creator, made after the temptation and fall of man—"Because thou hast done this, cursed art thou above all the cattle, and every bird of the field, upon thy belly shalt thou go, and dust thou shalt eat all the days of thy life." If we take a survey
of serpents in general, they have marks by which they are distinguished from all the rest of animated nature, they have the length and suppleness of the u. but want fins to swim with, they have the scaly covering and pointed tail of the lizard, but they want legs to walk with; they have the crawling motion of the worm, but unlike that animal they have lungs to breathe with; like all the reptile kind they are resentful when offended; and nature has supplied them with terrible arms to revenge every injury.

Though they are possessed of every degree of malignity, yet they are all formidably to man, and have a strong similitude of form to each other, with respect to their conformation all serpents have a very wide mouth in proportion to the size of the head; and, what is very extraordinary, they can gap and swallow the head of an other animal which is three times as large as their own. I have observed this fact of deglutition several times in the Coluber
or Cattle snake, when swallowing medium sized house rats, with great facility, after having killed and swallowed them, the snake in question had twelve corns and a button, thus we may infer it was 14 years old; considering it was one or two years old before it had any, those rats were several times larger than the snake's head, however, it is not surprising that the skin of the snake should stretch to receive so large a morsel; the wonder seems how the jaws could take it in. To explain this it must be observed, that the jaws of this animal does not open as ours, in the manner of a pair of tongs, where bones are applied to bones, and play one upon another, but in a very different manner to what we generally see.

On examining the articulations of the inferior or superior maxillae, of the rattlesnake, I understand how it is they admit so large a body in deglutition, the inferior and superior maxilla are articulated with the bone that joins with the posterior
portion of the cranium, it is nearly an inch in length running backwards and outward, this peculiarity of the three bones joining laterally, gives the broad and bulging appearance to the back part or posterior portion of the head, and admit bodies much larger than its own head.

While the action or process of deglutition is going on you notice the salivary glands are very much excited, without which it would be impossible for the snake to swallow an animal so large as a squirrel, rat &c. But the saliva flows in such quantity you may see it on the lips and in the angles of the mouth. The snake I was observing is what is called the Diamond rattlesnake, this species are very numerous in Roberson County Demifree. They are a very quiet snake when unmolested.

They have herd persons say, they have in their hunts came suddenly upon this species, and they would say
perfectly still until you might step over them, without being molested in the least, but as soon as you strike or touch them, they either strike in turn, or make ready for battle. I had three of this species, Diamond rattlesnake), and in any experiments on them, caging particularly; I was not as cautious as I should have been, on making a cage I would say to any one making or having made a cage for those animals, should not let the openings or interstices between the wires exceed 1/4 of an inch square, glasses may be put on the inside of the wire if you choose, but in my case I only had a wire front; the interstices being near 1/2 an inch square, the smallest one crept out between the wires in the warehouse, and during the time it was out, it caught and swallowed a common size rat. Fortunately there was a little dog left in the warehouse that night, the dog heard the snake rattling, and commenced barking, this disturbed my rest, I got up to put the dog out, and discovered that the snake had escaped, you can imagine.
how I felt better than I can describe, however. I, in company with my cousin proceeded to hunt its whereabouts, soon found it and by the weight of a large stone held it firmly, until it was killed by my cousin, you may rick assured it takes no easy blow to render one of those animals powerless, notwithstanding you may have seen in print where the naturalist speaks of the shallow cranium, and a light blow on the head killing them. Those three snakes lived apparently happy together, but the largest one did control the others, particularly when I would put a rat into the cage; all were very calm, but on being aroused with a rod they grew angry, the largest one in particular, it would coil upon itself in readiness to strike; at the same time rattle极其 furiously, the rats generally appeared very uneasy running round to find a way out, in one instance the rat reared up on the wire, showing fear even to trembling, in each case the largest one would end the fe-

one by giving it a blow, which in a space of time from two to eight minutes would suffice to kill, in one case after throwing a rat in at the small trap door above, I immediately opened the large door that hung before the wire front and saw the rat dead enough, in this case he must have pierced his most vital parts, strange to say they drank no water during the time I had them. They would move round from it as though it was repugnant to their feelings, the oldest and largest one lived about 7 months, and during this time eat three or four rats only, the one next to the oldest lived near five months without eating or drinking.

This snake would not eat any animal, excepting it was killed by himself. I tried them with small bits of beef, but they would not eat any of those substances. In one instance I gave them a small chick, and after exciting the largest one he struck it on the back, the blood jetting out once or twice, it was longer dying than any of the rats, the snake approached it, touching it with his tongue...
-ionly that he might know when it was dead, in a few
minutes he expanded his jaws and taking a firm hold
of it, but no sooner had he got it partly in his mouth
than he all at once threw it out apparently frightened,
as much as to say you don't suit my taste.
Antipathy of the rattlesnake to whitaash leaves.
The accounts given by Judge Woodruff mention that
he was one of a small party who went to the Mahoning
river for the purpose of hunting deer. The party took their
station on an elevated spot fifteen or twenty yard from
the water's edge. Here the men watched for their wished for
game about one hour, but instead of a harmless and be-
autiful deer, they saw a large rattlesnake which had
crawled out from among the rock beneath them, an-
d was slowly making his way across a narrow smo-
the sand beech towards the river. Upon hearing
the voice of the men, the snake halted and lay it-
retched out with his head near the water. It was
now determined to try the whitaash leaves. Accordingly,
search was made, and a small whitish sappling,
eight or ten feet long, was procured, and with a
view to make the experiment more satisfactory, an-
other sappling of sugar maple was cut. In order
to prevent the snake's retreat to his den, the Judge
approached him in the rear, and when he had
advanced within almost eight feet of him, the
snake coiled up his body, elevated his head
several inches, brandishing his tongue, and
thus signified his readiness for battle. The
Judge then presented his whitestick wand, plac-
ing the leaves upon the body of the snake. The snake
instantly dropped his head upon the ground, un-
folded his coil, rolled over on his back, twitched
and twisted his whole body in every form but that
of a coil, and gave signs of being in great agony.
The whitestick was then laid by, upon which the sn-
ake immediately placed himself in a coil, and
assumed the attitude of defence as before. The sugar
maple stick was next used. The snake darted forward in a twinkling, thrust his head into the leaves with all the malice of the under world, and then at once coiled and launched again, darting his whole length with the swiftness of an arrow after repeating this several times," says the judge. "I changed his face, and presented him with the whitewash. He immediately doused his back, stretched himself on his back, and writhed his body in the same manner as on the first application. All are covered with scales or scaly tubercles, their brain case or cranium is weak and shallow, the formation and conjunction of the vertebrae are well adapted for mobility, being that of a ball and cup articulation, these vertebrae varying in number, in serpents, differing in age.

All parts of their body have great force, agility, and elasticity. They are most abundant in warm and temperate regions, but increase in life and numbers, in proportion to the heat and moisture, and to
the freedom of their range. They have less blood than gua-
driped, a lower animal heat, and less interior activi-
ty of system. They are most animated in times of
storms and hurricanes, when the electricity of the
atmosphere is in the greatest perturbation. Their
sense of hearing is dull, but their vision is au-
tic. Their sense of taste is probably of consider-
able delicacy, as the tongue is very slender, and
divided into two joints or a bifid extremity, whi-
ich admits of it being readily applied to rapid ba-
dies. Their sense of touch is probably obscure. Th-
ey give many indications of high instinct and sen-
sibility, and have the faculty of existing a lo-
ing period without food. They have no voice.
but a hiss, which uttered softer or stronger ac-
cording to the exciting cause. It is exerted exclu-
sively in the declaration of their fiercer passions
In the snake under consideration, the most distin-
guishing characteristic is the rattle appended to its
subeandal extremity. These are considered to be a production of the skin, traversed by a soft cancellated bone, from microscopic examinations of Prof. E. D. Haskins of Clarksville, Tennessee. These corns are movable on one another, and when excited he considerable motion to this part, causing a rattling or singing sound, thus giving a signal of danger to whatever it might be that caused an excitement. In this we see the wisdom and goodness of our creator, in supplying the serpent with so venomous a poison, and at the same time making so great a provision for the higher order of animated nature, even man the master of all, by giving it an apparatus so well adapted to its nature, that it might warn an enemy or intruder in due time. The number of these corns or rattles increase with the age of the serpent, one being added on each arm.
the cornea cannot be seen on the film with the naked eye, but when seen in the snake it is a grey grey colour, the vertical diameter being twice or three times that of the horizontal, it has been said they have a mica-forming membrane to protect the eye, similar to that of a birds, but this I have not seen in my examinations, nor do I believe they ever have their eyes, if they did I never saw them. The attachment is beautiful in itself, and at the same time presenting the snake in its most beautiful colours, these are of an orange, tawny, and velvety colour on the back, and of an ash colour on the belly. The male may be readily distinguished from the female, by a black velvety spot on the head, and by the head being smaller and longer. I now give the microscopical examinations of the film or transparent membrane, by Prof. C. T. Watkins of Clarksville Tennessee.
Figure one is a highly magnified portion of the covering of the eye—A. is that portion covering the outer border of the cornea, and B. that covering the conjunctival portion—C. the transition from the conjunctival to the corneal portion, the hexagonal cells of B. measure 1/660 of an inch, those of A. the 1/800 of an inch. Fig. 2 exhibits the central portion of the corneal membrane—cells here measure 1/1000 part of an inch, you will thus see that the membrane is continuous having the same elements. That the cells rather abruptly become spread out as they reach the cornea, and then gradually move to the central portion of the cornea—1/660, then 1/800 and lastly 1/1000 of an inch. Figure 3. Represents the pigment cells as found in the colouring matter of the skin of the head—highly magnified—their hexagonal form not to perfect. Serpents which are venomous par excellence, have their organs of manducation construe-
appropriate muscles, raise it for inflicting the bite, before and after they lie folded back in the mouth, surrounded by a dense cellular sack. Behind them are several germs destined to replace them, in the event of either of them being broken off in a wound. These venomous teeth have been termed by naturalists movable fangs, but in fact it is the maxillary bone which moves; there are no other teeth in it, so that in this kind of dangerous serpents only the two rows of palatine teeth are to be seen in the roof of the mouth, these teeth are twelve in number, six being in each row, and with those in the inferior maxilla six or seven on each side, are called teeth of retention. They are curved from before backward, thus being well adapted for retaining its prey on being grasped. The poison is secreted in two con-
glomerate glands, which lie on each side of the head, and is carried by ducts to the roots of the fangs, where it is discharged into the poison bag. This consists of muscular fibres, both longitudinal and circular, by which it contracts when the fangs are retracted, and by this contraction the poison is forced into the canal at the roots of the fangs, and forced out at the aperture near the point. The poison itself is an acid with many saline ingredients, which rapidly crystallize on exposure to the atmosphere. It exists only in small quantities, but a very small drop is sufficient to produce death. All these venomous species, whose mode of production is well known, bring forth live young one, as their eggs are hatched without being laid, from which circumstance it derived their common name of Vipers, a contraction of viviparous. When a reader, ignorant of anatomy, is told, that some of these animals produce
their young alive, and that some produce eggs only.
She is apt to suppose a very great difference in
their internal conformation, which makes such a
variety in these manners of bringing forth. But
this is not the case; these animals are internally
alike, in whatever manners they produce their
young, and the variety of their bringing forth
is rather a slight than a real distinction.
The only difference is, that the viper hatches her
eggs, and brings them to maturity, within her-
body, the snake more prematurely in her productions,
and sends her eggs into the light sometime before
the young ones are capable of leaving the shell.
Thus if either are opened, the eggs will be found
in the womb, covered with their membranous
shell, and adhering to each other like large
beads on a string. No subject has caused
more philosophical controversy than the pois-
on of serpents, with regard to its nature
and mode of operating, towards the end of the last century, this subject was greatly illustrated
under the auspices of Ferdinand 2 Great Duke of Tuscany: This prince, desirous of enquiring
into that mysterious question, the nature of serpents, invited Steno, Rhead, and some other phi-
losophers of the first eminence, to his court;
and a multitude of the most poisonous serpents being collected, Rhead, made sever-
al experiments upon them, which discovered
to him a number of particulars before unkn-
own; of which the following seems to have the best claim to our attention, when he either ca-
duced a living viper to bite a dog, or wound
ed him with teeth of one newly dead (the pois-
on vessel remaining unbroken). the event w
as the same. If the bite was repeated, its effe-
cys became weaker, and at last was lost, the
poison contained in the vessel being totally exb
...rusted. That the teeth of serpents, when extended to bite, were moistened over with a certain liquor, and when the vessel at the base was pressed, a drop of poison flowed to the point of the fang, when the poison thus flowing from the vessel was received into a soft bread or sponge, an animal bitten by the serpent received no more harm from the wound than from being pricked by a needle, till after a few days, when the venom was restored afresh; but when an animal was wounded with the point of a needle dipped in the poison, it was tormented with the same pains as if it had been bitten by the viper itself. Preserving some of this poison in a glass, and totally evaporating the moisture in the sun, when the residuum was diluted again with water, and the point of a needle dipped in the solution, Rhed found to his great surprise, that it had the same effect as when rece-
But the boldness of Loffizi, one who charmed vipers, flung all those men who were deeply versed in natural philosophy into the utmost astonishment. They happening to fall into discourse (while the prince was present) upon the certain death that would attend any person swallowing this poison by mistake, instead of spirits of wine or water, Loffizi confiding in his art, drank a considerable portion of it without hesitating. They were all astonished at his apparent rashness, and predicted instant death to the man; however, he escaped as safely as if he had drank only so much water. This event, which struck the prince and his illustrious associates in their philosophical inquiries by its novelty, was well known to the ancients. Ducan, in the 7th book of Dharfahia, speaking of the serpent, says:

Nov serpens non est admor sit sanguine pestis,
Mordu virus habent et atum dente minatur.
Dacuta morte canent.

Mixed with the blood this venom flows along.

This bite is poison; death is in his fang.

Yet is the drought insidious.

The bites of all venomous serpents are cured by
the same local, which are very simple, if they
were always at hand. The injured part must be
instantly destroyed or cut out, destroying it is
the most safe, and equally certain; and the
best application for that purpose is the Lapis
jumalis or Caustic Potash. These are preferable
to a hot iron, which the ancients used, beca-
use a hot iron forms an eschar, which acts as
a defense to the tender parts, instead of de-
stroying them. The Lapis infernalis is much be-
ter than any other caustic, as it dissolves
and penetrates during its application. The
bitten part must be destroyed to the bottom,
and where there is any doubt that the
Bottom of the wound is not sufficiently exposed. Caustic Potash should be introduced into it on the day following, as deep as possible, and incisions should be made to lay every part open to the action of these applications. Besides destroying, burning, or cutting out the part, incisions should be made to lay every part open to the action of the wound, to prevent the communication of the virus. The wound is to be dried for some time with poultices, to assuage the inflammation caused by the caustic, and afterwards with acrid dressings and hot digestive to drain the injured parts. Ligatures applied instantly above the bitten part, if it be so placed as to admit one, was found by some experiments a good preventative against the diffusion of the poison; its compression should be considerable, but not excessive.

The Southern Medical Journal contains the
description of a case by Dr. J. A. Atchison, in which a girl seventeen years of age, bitten on the left instep by a rattlesnake, was cured by being placed in a hot bath, whiskey, and carbonate of ammonia administered to her, until she had taken three parts of the former, and eighty grains of the latter. It was two hours and a half after the bite that Dr. A. visited his patient, when he found her sight lost, her face swollen, and her mind wandering. The liquor caused no intoxication, and the cure was complete.

The snake may reach the eminence as certainly as the eagle, but he reaches it by crawling, and he still remains a snake.