BROODING SNAKES.

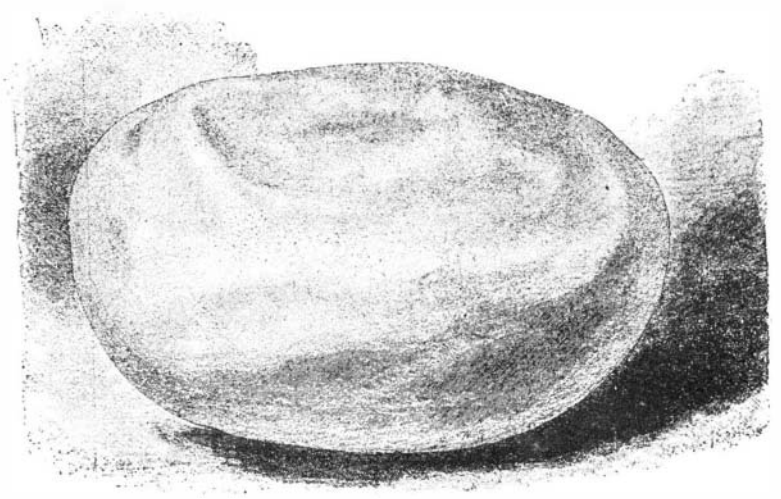
The love of parents, especially mothers, for their offspring is a common and deep-seated characteristic of animal nature, and this love is necessary for the preservation of the species, for without it the progeny would not survive.

Creatures as low on the scale of animal life as the sea snails or worms guard their eggs. When danger threatens, even the common ear-wig sits over its tender young as an old hen does over its chickens, and many spiders place themselves as protectors over the balls in which they have concealed their eggs. Others carry their sacs of eggs. All of these creatures are spoken of as hatching their eggs; but the term is not correctly applied, for the word "hatch" implies the use of artificial heat, and we know that heat is not used in these lower animals. With birds it is different, for they are warm-blooded creatures, whose temperature is unaffected or only slightly affected by the influence of the surrounding air or water. On the other hand, reptiles are cold-blooded, and the temperature of their blood is affected by the temperature of the surrounding medium; therefore they are not in a position to impart warmth to their eggs and hatch them out. Most of the reptiles that lay eggs put them in protected places, in cracks or holes in the ground, in vegetable matter, or bury them in sand.

But in nature, as in everything else, there are exceptions to all rules, and in this case the exception is the python, a native of tropical Africa and Asia. While the young of its nearest relative, the boa of South America, are born alive, it lays eggs and hatches them by developing a high degree of heat, as has been proved in the case of the Indian and African species. The first careful investigations of this subject were made in 1841 by the renowned naturalist Achille Valenciennes, in the Jardin des Plantes, Paris. A python there laid fifty eggs within three hours, which at first were oval, but pointed toward the poles, the shells were soft and of a gray color; they soon changed to a perfect egg-shape and became white, and the shells hardened somewhat, although they remained pliable, like leather, and were lusterless and rather rough. Their length varied from 2½ to 4½ inches. After laying the eggs the snake gathered them together in a heap under the cover she had in her box, wound the rear part of her body around the base of this heap and then formed a cone-shaped spiral of the rest of her body around the whole, her head closing the top. Not a single egg was visible. After fifty-six days the first young ones crawled out. They were about 2 inches long. The temperature in the center of the heap of eggs was 105° F., while that of the box was only 72·5° F.

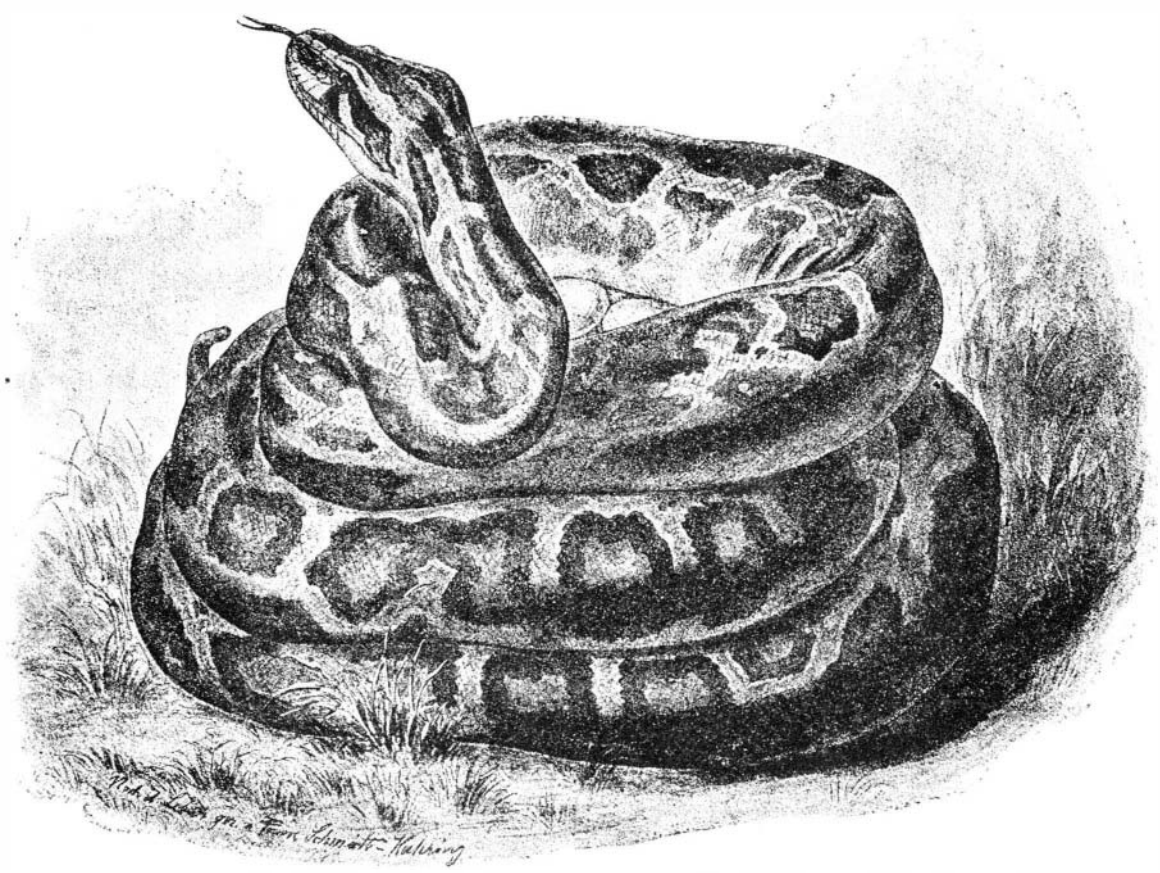
Two other pythons tried to hatch their eggs in the London Zoological Garden, one in 1862 and the other in 1881. In these cases the difference between the temperature inside of the heap of eggs and the outside air was much less; but the eggs were spoiled and no young were hatched.

In the zoological garden of Mr. Pinkert, in Leipzig, two brooding snakes (*Python molurus*) can be seen, each one rolled around its pile of eggs in the manner described by Valenciennes. Careful measurements taken on June 21, between 8 and 9 o'clock in the morning, showed the temperature within the rings of the snake to be 82° F., while that of the box was 67·5° F. The thermometer could not be placed in the bottom of the heap, where the heat was considerably greater; but it was left 20 minutes inside of the rings. It was impossible to experiment much with the creatures without causing injury to them and their young. —*From an article by Wm. Marschall in Illustrirte Zeitung.*



EGG OF A PYTHON—NATURAL SIZE.

DRAWN BY FRANZ SCHMIDT-KAHRING.



A BROODING PYTHON IN THE ZOOLOGICAL GARDEN, LEIPZIG.

DRAWN BY FRANZ SCHMIDT-KAHRING.

EYEGLASSES are worn by fifty-four members of Yale's senior class, twenty-five of whom have been forced to adopt them since entering college. Their favorite glass, the seniors in their annual class-book admit, is the beer glass.

Alloys of Aluminum.

Aluminum when alloyed with titanium, especially in certain proportions, gives a product which, in addition to the many useful properties of aluminum which render it capable of varied application in the arts, possesses other beneficial properties in which aluminum is deficient. Thus, although pure aluminum is somewhat soft and only slightly elastic, even after hammering or rolling, if it is alloyed with 10 per cent of titanium or less, a product is obtained intrinsically harder than aluminum, approximately as incorrodible, and capable of acquiring by hammering or rolling a degree of elasticity and hardness comparable to spring brass.

This alloy is fusible at a temperature below the melting point of steel, and its fusing point and specific gravity increase with the proportion of titanium which it contains. When the proportion of titanium is less than 5 per cent, the alloy is nearly as malleable as pure aluminum, and its malleability decreases and its hardness increases as the proportion of titanium in the alloy is increased. The best material for commercial uses, where elasticity combined with easy malleability is required, is an alloy containg titanium from one-half of 1 per cent (more or less) to 2 per cent.

By substituting for the titanic oxide or salt the oxides or salts of other metals more electro-negative than aluminum, the metallic bases of such oxides or salts may be alloyed with aluminum in like manner. Metals which can be alloyed thus with aluminum are bismuth, cadmium, cæsium, cerium, chromium, cobalt, copper, gold, iron, lead, manganese, molybdenum, nickel, osmium, palladium, platinum, silver, tin, titanium, tungsten, uranium, and zinc.

This alloy is made as follows: A bath of fluorides of aluminum and sodium or of fluoride of sodium, or of fluorides of aluminum, sodium, and calcium, or generally a fluoride or fluorides of a metal or metals more electro-positive than aluminum, is made by fusion. There may be added to these fluorides chlorides of the alkalies or alkaline earths; but these are unnecessary.

Cryolite of commerce may be used as the fluoride constituent of the bath, but it is in some respects disadvantageous because of its iron, which in the alloying process is reduced, and by mingling with the alloy impairs its quality. For this reason the fluoride is employed in as pure a state as possible. Either before or after the fusion of this fluoride bath there is added to it a reducible oxide or salt of the rare metal to be alloyed. In making an alloy of aluminum and titanium, titanic oxide is preferably used, and after thorough admixture of these substances, the oxide or salt being dissolved by the fluoride, the aluminum is introduced either in a molten state or in a solid state. When introduced in a solid state it is fused by the heat of the bath, and when fused a reaction between the aluminum and the oxide or salt at once takes place, the oxide or salt is reduced, its oxygen or acid radical combines with a part of the aluminum and the freed metallic base immediately alloys with the remainder of the aluminum. In practice, the fluorides of aluminum and sodium, which may be employed in amount ranging from 100 to 400 per cent of the weight of the aluminum intended to be added, are preferred. This bath is melted in a carbon crucible and the oxide or salt of the metal to be alloyed is added thereto.

When the whole mass is incorporated and as nearly fluid as possible, metallic alluminum is charged into the crucible, the relative proportions of the aluminum and oxide or salt being such that the percentage of oxide or salt shall be about twice the percentage in which its metallic base is desired to be present in the alloy. Immediately on the introduction of the aluminum the reaction noted takes place between the aluminum and the oxide or salt, and is accompanied by a rapid elevation of temperature in the bath. After waiting until further reaction ceases, which is indicated by the cessation of rise of the temperature, the contents of the crucible are poured into a suitable receptacle, and after cooling somewhat the melted fluoride can be separated as a supernatant slag from the metallic alloy at the bottom of the vessel. The alloy is then collected and is preferably remelted to cleanse it thoroughly from slag and otherwise to improve its properties.

It is important that the reduction of the oxide or salt of titanium and its alloying with the aluminum should be conducted in a non-silicious crucible (preferably a carbon crucible), since if the vessel be silicious in its composition a considerable portion of silicon will be alloyed with the aluminum and titanium, producing a compound of inferior quality.

The addition of chromium to the alloy of aluminum and titanium is of advantage in increasing the stiffness of the alloy. It is desirable that the chromium should be less than 15 per cent, preferably less than 5 per cent. As the chromium is increased, there is a corresponding increase of hardness. The difference between the alloy of aluminum and titanium and the alloy of aluminum, titanium, and chromium is that the chromium confers greater rigidity than the titanium; but if more than 5 per cent of chromium is used there is a greater loss of ductility.

Marking Soap Cakes.

The manufacture of cakes of soap that show the name or other designation used until the last of the cake is used has been exploited for some time in this and other countries, but so far as we are aware none of the plans so far adopted to this end resembles the following, which has just been patented in Germany. According to this latter invention, cakes of any ordinary soap are pressed in such a manner that the center on one side is depressed to half the thickness of the cake. Upon the bottom of this depression is placed a printed slip of paper, bearing the name, etc., of the soap, and the hollow is then filled out by inserting a piece of transparent soap. As a special advantage it is mentioned that the manufacturer, in adopting this plan, can dispense with the use of special dies for customers who require their names on the soap.—*Amer. Soap Jour.*

A TUNNEL under the Thames was proposed in 1799; the first tunnel was finished in 1843.