

Contribution towards the knowledge
of snakes in Brazil - A

PART II

Biology of the new species, *Lachesis insularis*

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During two excursions made to Queimada Grande Island, the natural *habitat* of this snake, I had occasion to study this species and made an appreciable number of observations, which later I was able to reproduce with entire success in a snake-hut, purposely prepared in the park of the Butantan Institute. The first excursion which lasted 8 days was made in the first days of April 1920; the second, which lasted 10 days, was made in November of the same year.

Queimada Grande Island — This island is situated on the coast of the State of São Paulo about 40 miles S.W. of the bay of Santos. It is formed by a very steep rock and has about 1 km.² 500 of surface and there the Marine Ministry maintains a 4th. rate light-house (Plates V; VI, fig. 1; VII). Surrounded on nearly every side by enormous rocks which offer safe shelter to sea-gulls («mergulhões», «gaivotas») and other birds of the sea, and unprovided with any bay or protected landing, it is entirely inaccessible when the sea is rough. (Plates VI, fig. 2; VIII, figs. 1 and 2). There are 3 or 4 light-house watchmen and 1 or 2 sailors living there who are obliged to save rain water for cooking and drinking, as the island has no spring of fresh water.

The absolute lack of resources is what most impresses the traveller. To make bad matters worse, the dwellers on the island are sometimes deprived of even the chickens which they raise for their nutrition for, as it is a regular «paradise of snakes» the unfortunate fowls are frequently decimated by the *Lachesis insularis* which are found in amazing numbers. It will be enough to state that, quite contrary to what might have taken place in another locality, I was able on my first trip to easily capture 42 specimens of the *Lachesis*, and 24 on the second. The Butantan Institute has up to date received 463 specimens of this snakes from that region, 203 of which were preserved and are incorporated in the snake collection and 32 which are at present being raised in a snake cage.

Besides this species of snake only the *Dipsas albifrons* (SAUV.) occurs in the Island. It seems, however, to be of very rare occurrence. It is tree-living and feeds on snails (*Vaginula* sp.).

Lachesis insularis — In accordance with very minute observations which I made and which have been confirmed by the intelligent light-house watchman, MR. ANTÔNIO ESPERIDIÃO DA SILVA, I was able to ascertain on my first excursion that the *Lachesis insularis*, although provided with a pupil conformed for night life are also

active during the day (perhaps exclusively confining themselves at present to day life) because of the necessities of providing themselves with nutrition. I frequently saw specimens in great activity during the day, principally between 9 and 11 in the morning and 3 and 5 in the afternoon, an abnormality which I was able to explain shortly afterward when I discovered the nutrition of the species. The snake is exclusively tree-living, generally found on trees and shrubs which bear small fruit. Here it remains, often for several days, awaiting its usual prey. Besides this, it is exclusively avivorous: when some bird comes carelessly hopping on the tree looking for ripe fruit to eat and hops on a branch near the snake, or even on the snake itself, it is immediately surprised by the attack of the enemy which, never missing its mark, nearly always pierces the bird in the breast or neck. If peradventure the dead bird falls to the ground when the snake did not get a good hold, the *Lachesis* calmly descends by the trunk of the tree or by the nearest liane and looks for her prey on the ground.

I only had occasion, however, to observe this curious fact three times: nearly always snake inoculates the poison in the bird and is able to retain it, beginning immediately to swallow it head first.

More or less 10 minutes⁽³¹⁾ after swallowing the bird the snake comes down the tree and lies on lianes or brush-woods or even on the ground itself beside the trunk or in the concavity of some rock during the time the food is being digested.

The trees to which the *Lachesis* give preference are exactly those which most attract the birds by their fruit. Among these trees I can cite the following: *Trema micrantha* (Sw.) ENGLER («Crindeuva»), *Cordia curassavica* FRESEN («Herva baleeira»), *Rudgea aff. coriacea* K. SCH. («Café de pobre») and two *Myrtaceæ*, *Eugenia* sp. («Aperta gula»), and others commonly known by the name of «Myrtle».

In exceptional cases I found specimens of the *Lachesis* on trees with no fruit: fig. 2 of plate X is exactly reproducing a photograph of a specimen in a tree in this condition. The snake is 6 meters from the ground on a branch of the *Rapanea guianensis* AUBL. («Capororoca»).

Finally, these specimens are also found coiled on the flower-bearing branches of the *Gramineæ* which, as everybody knows, attract flocks of birds in the fruit bearing season.

The species of birds on the Island which are more frequently the victims of the *Lachesis* are: *Elaenia mesoleuca* (CAB. et HEINE) commonly known by the name of «João-tolo»; *Sporophila caerulescens* (BONN. et VIEILL.) commonly known by the name of «Papa

⁽³¹⁾ Sometimes much more or much less, according to the volume of the bird and to the shape of the snake.

capim»; and, sometimes, *Platycichla flavipes* (VIEILL.), known as the «Sabiá-una».

These interesting facts are reproduced in the various photographs consisting of Plates IX, X, XI, XII, XIII, XV, XVI and XVII which correspond to some of the many snapshots taken by the photographers who accompanied me, Mr. J. DOMINGUES DOS SANTOS on the 1st. excursion, and Mr. C. R. FISCHER on the 2nd.

Besides these, I was able to follow up many interesting facts on Queimada Grande Island, the most important of which concern the influence exercised by the wind towards the appearance of snakes. When, for example, a strong N.W. wind blows, flocks of birds fly from the coast to the Island and it is not long before the *Lachesis* will be seen on the S.E. side, exactly where the fugitive birds generally look for shelter. Again, when an implacable S.W. storm springs up bringing disquiet to the hearts of the inhabitants of the island, one is sure to find the snakes on the N.E. sides where the birds are driven.

With the live examples which I transported I was able to continue my observations at the Institute, having found that, contrary to what takes place with other *Lachesis*, they pay no attention to the presence of people, feed with facility (Plates XIV, figs. 1 and 2; XV, fig. 1), and even copulate in captivity, if the surrounding conditions are more or less like those to which are accustomed on the Island.

Rutting time generally begins in August and lasts till the middle of September.

The act of copulating which is very delayed generally takes place on trees or sometimes on the ground.

Their young, 9 to 16 in number, are born in the second half of January and immediately seek a hiding place under dry leaves or under moss found on the ground.

* * *

In conclusion to these notes on biology, I believe it will be convenient to transcribe here, in a rapid synopsis, some of the principal data from a monograph which I am already outlining, concerning the properties of the *Lachesis insularis*' poison.

The poison has approximately the same reaction and colour as that of *Lachesis jararaca* (WIED) and of *L. atrox* (L.). However, it is different in its hemolytic, proteolytic and coagulant properties, and above all, by the toxic activity, which is far stronger.

Thus, for example, in tests with the pigeon, which is the most appropriate species of animals for such, due to its sensitiveness and the uniform results obtained, the minim lethal dose of *Lachesis insularis* poison is by intra-venous channels — 0 gr. 000004, against

0 gr. 000010 and 0 gr. 000020 which are, respectively, the minim lethal doses of the *L. atrox*' and *L. jararaca*'s poison through intra-venous channels in pigeons. By intra-muscular channels — the minim lethal dose is 0 gr. 000040 as against 0 gr. 000500 and 0 gr. 000700 which are, respectively, the minim lethal doses of the *L. jararaca*'s and *L. atrox*' poison by intra-muscular channels in pigeons.

Notable difference are manifest in the neutralizing action which the anti-toxin exercises on this poison, as a specific serum for *L. jararaca* which with 1 cc. neutralizes 0 gr. 0026 of the poison of this species, can only neutralize 0 gr. 001 of the *Lachesis insularis*' poison.

Finally, on making tests on birds I observed that the activity of this poison is also very strong, for exemple, 0 gr. 000010 through intra-muscular channels being sufficient to cause the death of a «Tico-tico» = *Brachyospiza capensis* (MULL.).



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Fig. 1

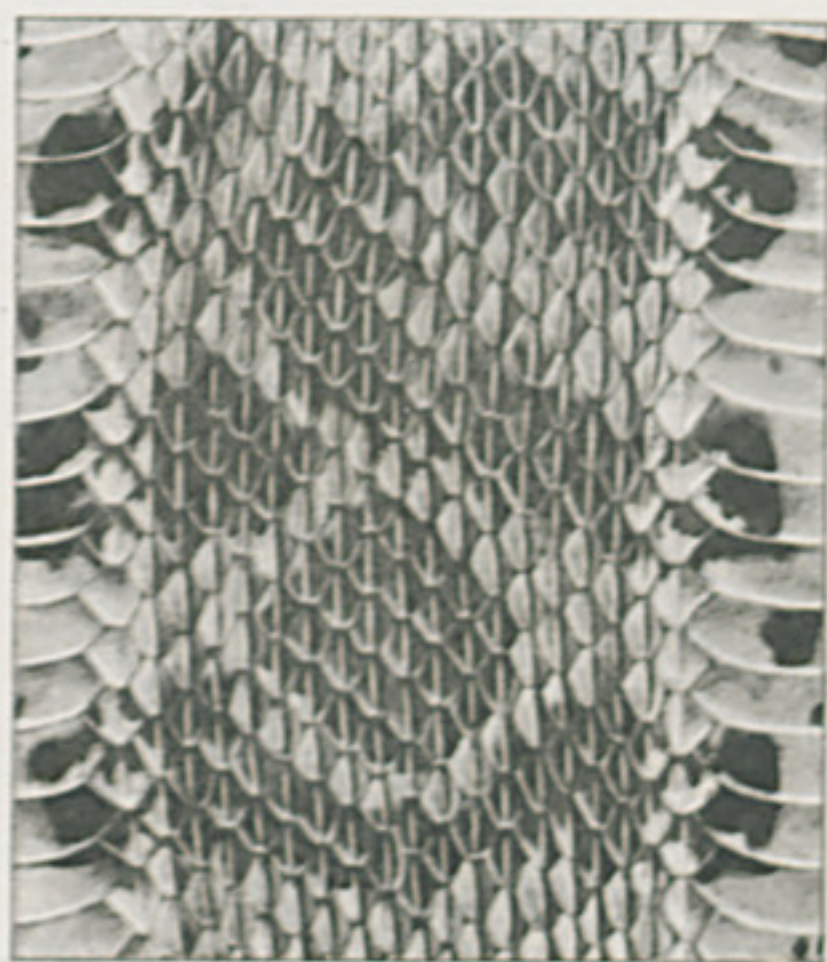


Fig. 4



Fig. 3



Fig. 2



Fig. 5



Fig. 6



Fig. 7



Fig. 8

RUD. FISCHER, del.



Fig. 2



Fig. 3



Fig. 4



Fig. 1



Fig. 5

RUD. FISCHER, del.



Fig. 1



Fig. 2



Fig. 4

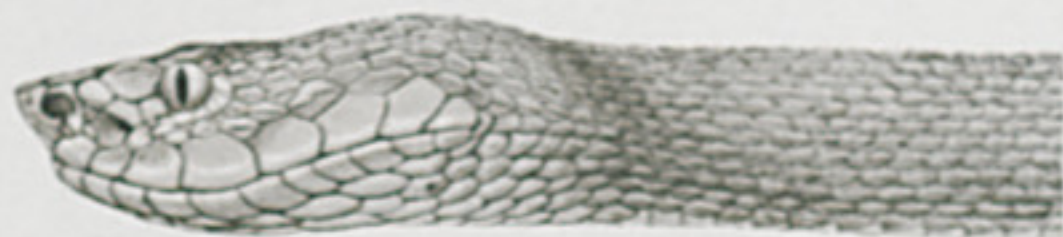


Fig. 3



Fig. 5



TAMANHO $\frac{2}{3}$ DO NATURAL

RUD. FISCHER. del.



Fig. 1



Fig. 2



Fig.



Fig. 1



Fig. 2



Fig. 2



Fig. 1

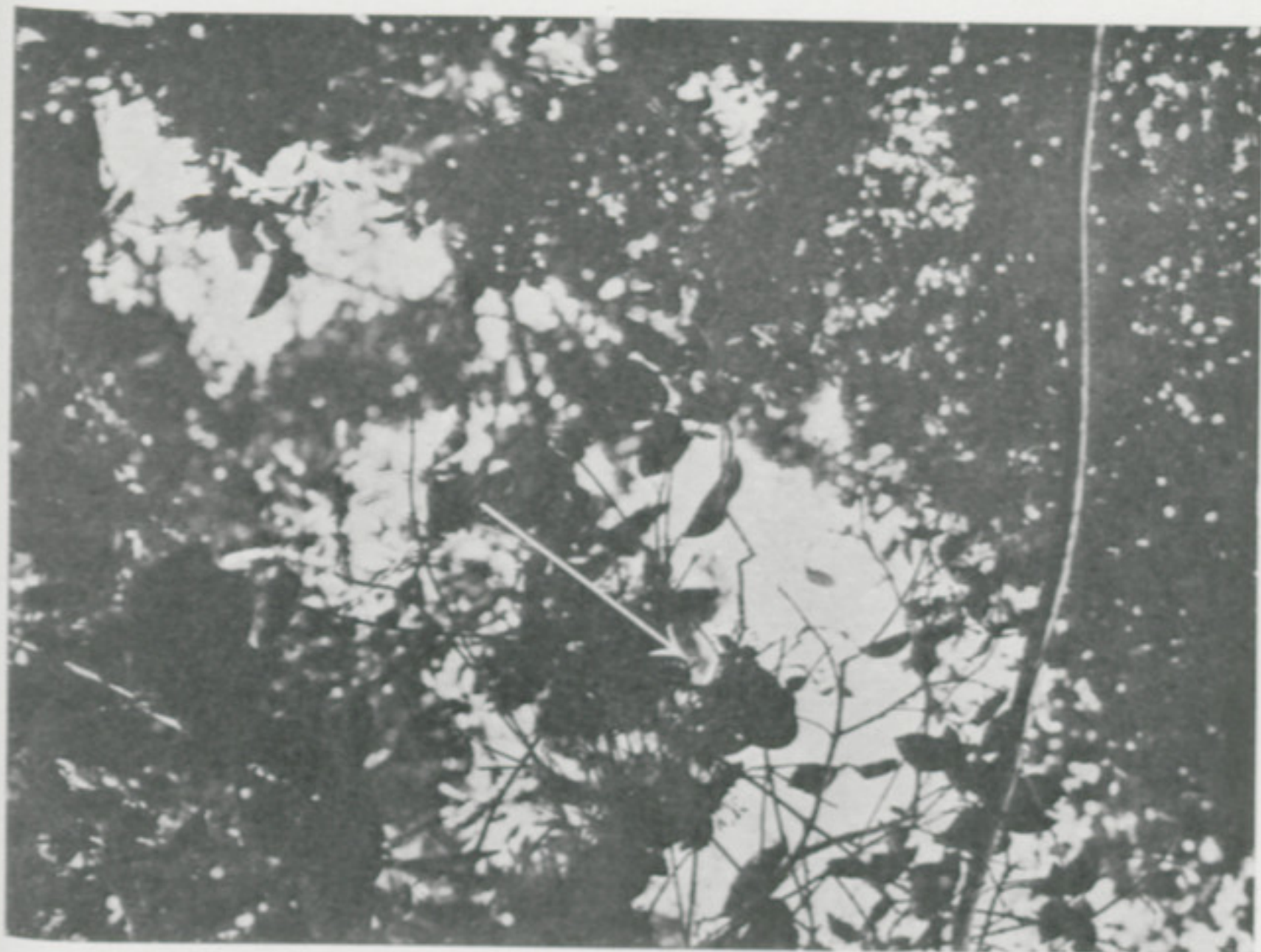


Fig. 1



Fig. 2



Fig. 2



Fig. 1



Fig.



Fig.



Fig. 1



Fig. 2

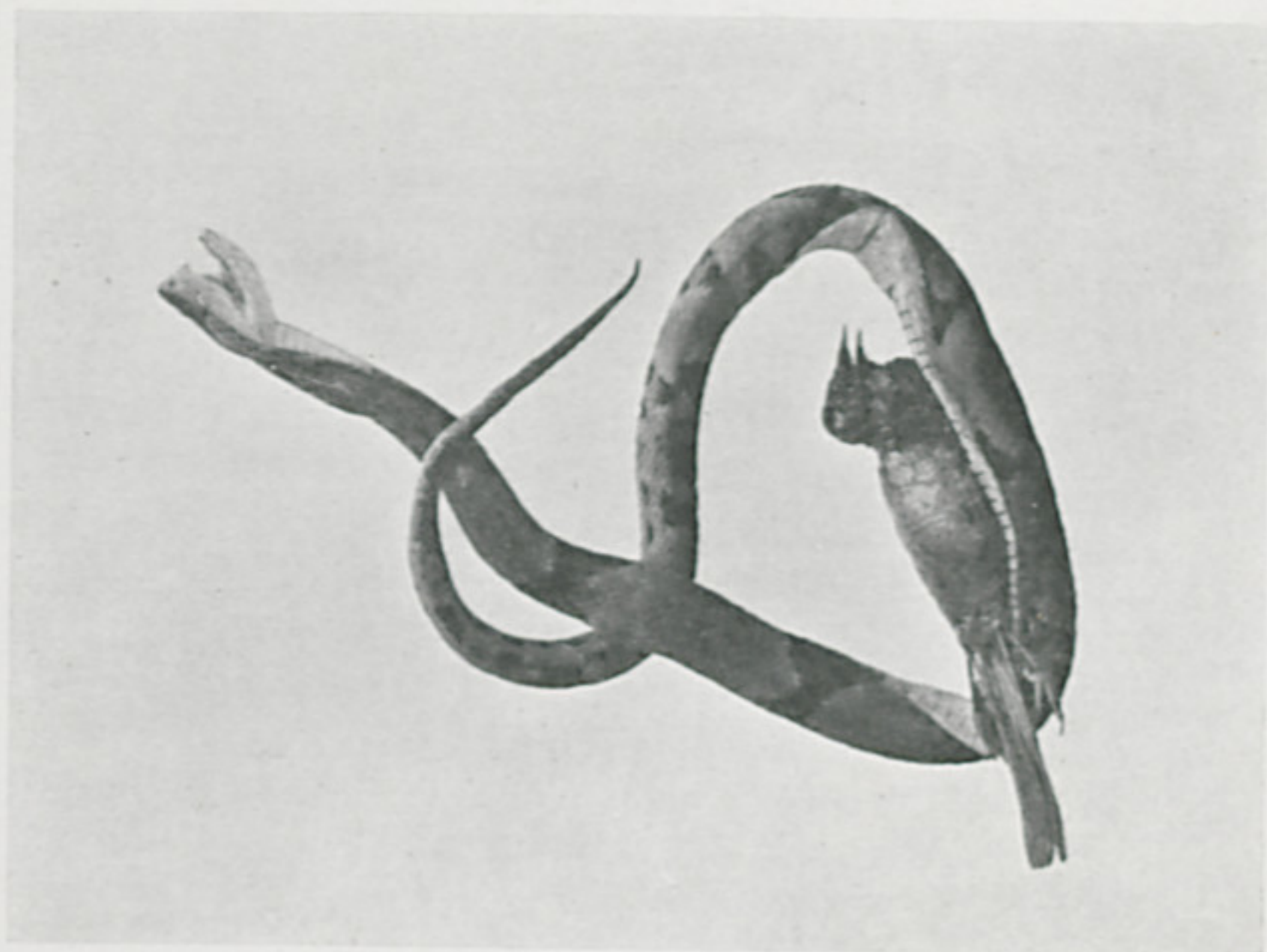


Fig. 2

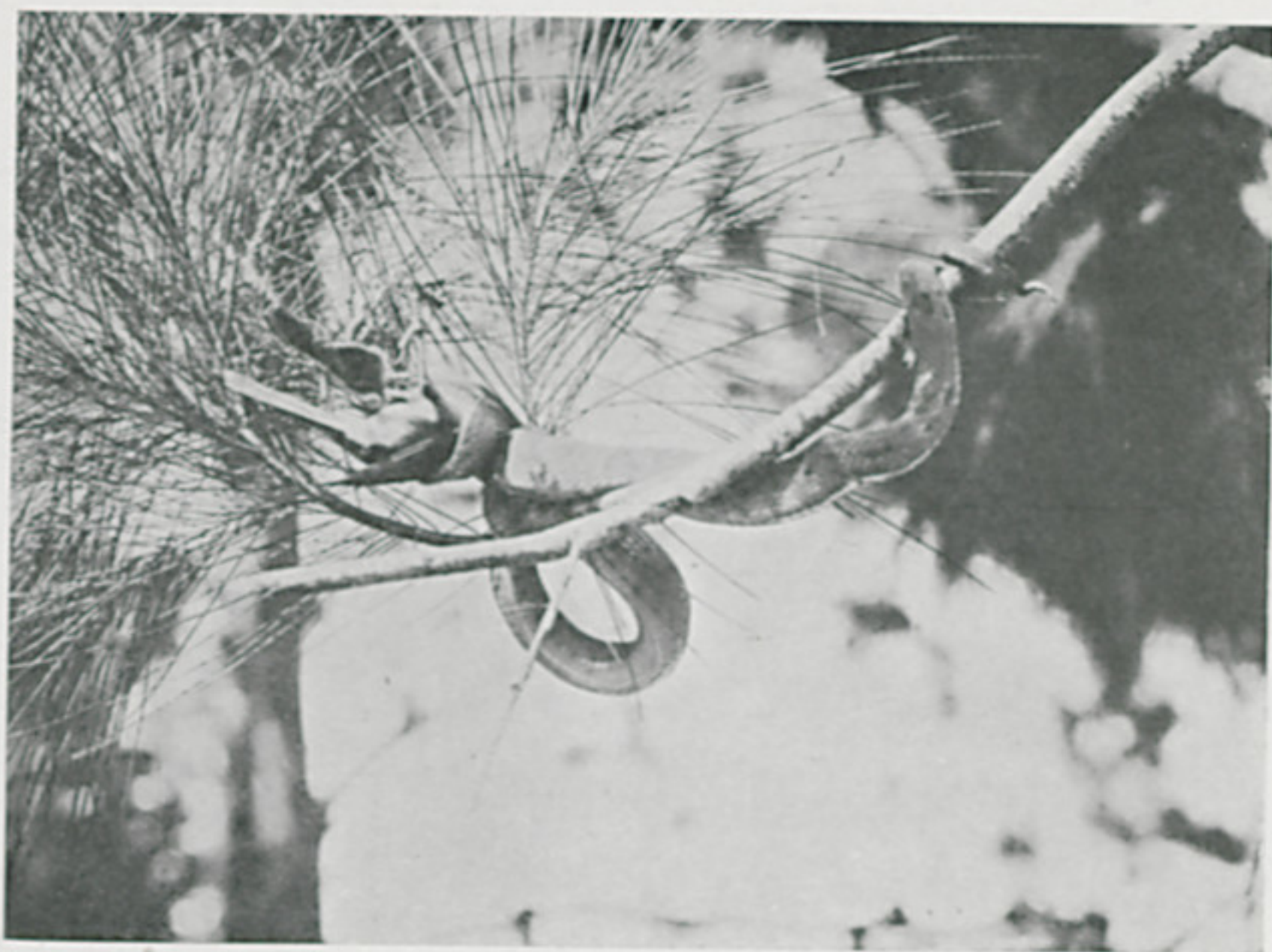


Fig. 1



