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THE SNAKE FARM AT BUTANTAN BRAZIL

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The
SNAKE FARM
at
BUTANTAN BRAZIL

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*Administration Building and Laboratories. The Institute of
Human Pathology, Butantan*

ONE COLD JANUARY MORNING in 1916 John Toomey began his usual work of cleaning the cages in the reptile house at the Bronx Zoo in New York City. Coiled in the back of one of the cages on that morning were several big rattlesnakes, which had just been shipped from Texas. As Keeper Toomey reached into the cage with his long-handled shovel, one of his hands came near the coiled snakes. Quick as a flash, one of the big rattlers struck.

John Toomey was the first person ever bitten by a snake at the reptile house. But all the keepers had been carefully taught exactly what to do in such a case. Within two minutes they had placed a tourniquet on Keeper Toomey's wrist just above the hand that was bitten. Another had been placed just above the elbow. One of the keepers sucked the wound to draw out the poisoned blood. Then he cut the wound to make the poisoned blood flow out.

By that time the doctors had arrived. They had some grains of an anti-venom serum, but these grains had to be dissolved in boiled water about forty-five minutes before they could be used. Such a long wait was dangerous. At last the grains were dissolved, and the liquid injected into Keeper Toomey's arm.

Soon the effects of the snake poison began to show on Mr. Toomey. He became wet with perspiration. He shivered with chills, and felt nauseated. His arm swelled, and the swelling began to spread over his body. The snake poison was doing its work. Those who were caring for Keeper Toomey thought he would die.

Then one of the doctors remembered that Dr. Vital Brazil of the Butantan Institute in Brazil was lecturing in the

The snake farm is only a small part of the Institute

United States. Dr. Brazil was known throughout the world for his work in treating snake bites. If he could be found, he might be able to give some help to John Toomey. Fortunately, Dr. Brazil was in New York and had with him some of his rattlesnake serum which he injected into Toomey. It worked like magic. In a few hours the chills and nausea had stopped. Twelve hours later the swelling had been greatly reduced, and the natural color was returning to Keeper Toomey's skin. Three weeks later he left the hospital to return to work at the Zoo.

The cure of John Toomey brought the Butantan Institute to the attention of people in the United States. Newspapers carried stories about Dr. Brazil and the work he was doing at Butantan Institute. Perhaps because of the story of Mr. Toomey, many people still think that Butantan Institute is interested only in snakes. However, visitors find that the snake farm is only a small part of the Institute.

The "side show" of the Institute, some of the employees call it, because it attracts so much attention.

Butantan Institute was established in 1899 to provide serum in fighting bubonic plague which was then spreading through Brazil. Since that time the work of the Institute has been increased so that a great many different types of serums useful in treating various kinds of diseases are developed there. A well-trained staff works constantly on scientific research, trying to find better ways of keeping people well and of curing those who are sick. Every year members of the staff publish articles in the Institute's Annual Report, telling of the work done and some of the interesting things discovered in research. This information is very helpful to others who are also working in the field of health. The staff is very proud of the fact that within five years—1935 to 1940—the Institute increased its production of diphtheria anti-toxin from 21 quarts to 528 quarts. The Institute furnishes free all of the diphtheria vaccine for the public schools.

Butantan Institute is located on the outskirts of São Paulo, high on the hills overlooking a fertile valley. A new building just completed is being used for bacteriological research. The old building

Snake houses look like Eskimo igloos

has laboratories where the various serums are prepared, a chemical laboratory and offices for the people who direct the Institute.

A description of all the work done at Butantan Institute would fill a large book. Here we will tell only of the section which prepares anti-venom serums for snake bite.

At Butantan the snakes are kept in a serpentarium, a small, clean park, dotted with dome-shaped houses and enclosed by a moat. The outer wall of the moat is topped by an iron picket fence. At first you wonder why the picket fence is there. But you learn that it was built there to keep visitors from falling among the snakes!

Visitors can stand at the picket fence and watch the snakes with perfect safety. The fence is set in a smooth concrete wall which goes down several feet. The snakes cannot possibly climb the wall. Since they have neither arms nor

The yard where non-poisonous snakes are kept

The poisonous snakes are taken up by an iron hook

legs, they must have something to push against in order to crawl. If a snake is placed on a piece of glass, or any smooth surface, it will slip helplessly around, unable to go forward in any direction. The moat at the bottom of the wall encloses a well-kept lawn. This lawn is not much higher than the water. If a snake becomes tired of swimming, it can crawl over and curl up on the grass. On hot days the snakes glide over to the little houses and disappear within.

These snake houses look something like small Eskimo igloos. Instead of being white, however, they are grayish pink or dull red. Like the walls of the snake pen, they are built of concrete and make very comfortable houses—for snakes! Because the walls are thick, the temperature inside remains fairly constant. If the day is too warm, the snakes enjoy the coolness inside the houses. If the weather is too cool, they then slip into the houses to find warmth. But the snakes at Butantan suffer very little from extremes of tem-

perature. Breezes from the mountains sweep across the valley and keep the serpentarium pleasantly cool the year round.

If you visit the Institute, you may be fortunate enough to see the various steps by which the anti-venom serums are made. The man who handles the snakes so easily and knows so much about them is Mr. Cavalcanti. He has been at the Institute working with the snakes many, many years. He will show you how poison is extracted from the snakes.

Grasping a snake at the back of the neck, he will very carefully hold it so that it cannot bite him. A snake's fangs are in the roof of its mouth. Poisonous snakes have a double set of fangs. One set is for immediate use. The other set is sort of a "spare tire" to use in case the first set is injured. The poison is in little sacs back of the fangs. Whether a

wound from a snake's bite will cause death or not depends upon the amount and the kind of poison in these sacs. The snake will discharge only a part of the poison when it bites.

In order to get every bit of the poison, the doctor gently squeezes the sides of the snake's head. This is called "milking the snake," (a poison which comes out in thick, yellow drops). The person

Mr. Cavalcanti has worked with the snakes many years

The snake that bit John Toomey. Courtesy Brazilian Information Center

milking the snake is very careful not to hurt its mouth. If the snake is injured, it may die or stop making poison. This poison is milked from snakes about every two weeks. The snakes are never fed. There are two reasons for this. First of all, chewing would press out the poison and it would be lost. Then, too, there is no need to keep a boarding house for snakes when they can be so easily replaced. Usually they live only about six months at the serpentarium.

After the poison is taken from the snake it is dried and crystals form. Some of these are injected into horses which are kept on the grounds for this purpose. About a week later, a slightly larger amount is injected into the horses. Each week a still larger amount is injected, until in time the horses become immune and if bitten by a snake would suffer no bad effects.

After the first and following injections, the blood corpuscles have manufactured a substance, called anti-toxin to

fight the effects of the poison. This substance is contained in the fluid part of the horse's blood, which, when separated from the red and white blood cells, is a yellowish liquid. It is this that would keep the horse from having any ill effects if bitten by a snake. This same liquid injected into a person's blood will prevent him also from having ill effects from a snake bite. Three to five quarts is the average amount of blood taken from a horse at one time. However, the horses at Butantan soon weaken and die from the loss of blood.

Dr. Brazil was one of the first workers to discover that different kinds of snakes have different kinds of poisons. It was this discovery which led to the saving of John Toomey's life. The serum that had been injected into Toomey before Dr. Brazil arrived would have been successful in treating cobra poisoning, but it was almost useless for rattlesnake poisoning. The Butantan Institute has always taken a lead-

He holds the snake so that it cannot bite him

"Milking the snake"

ing part in classifying snakes, so that proper serums could be made for the treatment of all kinds of snake bites. The Institute has made serums for almost every kind of snake poison. There is also a serum prepared for use when the person does not know what kind of a snake has bitten him.

The Institute, which is now a part of the University of São Paulo, carries on an educational program. It teaches workers on plantations, small farms, and construction jobs in Brazil how to keep from being bitten. Posters are sent all over the country showing the importance of wearing leggings and of being careful in other ways in places where snakes are known to live. Workers are taught where to look for snakes. They are taught to watch sunny spots on cool days and shady spots on warm days. They must watch the swamps for water moccasins.

The Institute has also taught people how to catch snakes safely. It encourages them by offering anti-venom serum in

A properly trained person can handle snakes with safety

exchange for live snakes. In an average year, it receives more than seven thousand non-poisonous snakes and around twenty thousand poisonous ones. Not long ago a man brought to the Institute a boa over eight and a half feet long which he had caught. The non-poisonous snakes are kept in a separate enclosure where their habits can be studied by scientists in other laboratories at the Institute.

The Butantan Institute not only educates people in the proper methods of handling snakes, but often sends out the simple trap needed in catching them. This trap consists of a box (or bag) and a stick with a noose hanging from one end. When a snake sees a person, it will usually crawl the other way. It is fairly simple to put a noose in its path and then frighten it from the opposite direction, causing it to crawl into the noose. Then, while one person holds the stick so that the noose will become tighter, another person holds the snake's tail to keep it from lashing about and getting loose.

After the snake becomes calm, one person grasps it just back of the head and puts it into the box. Snakes are not natural fighters. Clifford Pope, of Georgia, who has studied snakes all of his life, says that snakes are first cowards, next bluffers, and last of all fighters.

Another way to catch snakes is to use a stick with a forked end. With this fork, the snake's head can be pinned to the earth until his captor can grasp it back of the head. At the Butantan Institute poisonous snakes are taken up by an iron hook. This leaves them hanging in the air, unable to strike because they have nothing to push against. Many silly tales and superstitions are responsible for much of the fear people have of snakes. It is true that some snakes are dangerous, but the Butantan Institute has shown that an intelligent person who has been properly trained can handle them with safety. But it is not wise for a person to try to capture snakes until he knows which are poisonous

Poison is also extracted from large spiders

and which are not. Even then, he should become an expert at catching non-poisonous snakes before he tries to catch poisonous ones.

Mr. Cavalcanti says that poisonous snakes are friendly but that non-poisonous snakes fight and now and then kill one another. Non-poisonous snakes also move much faster than poisonous snakes. In the yard where non-poisonous snakes are kept at Butantan, there is a large tree. Sometimes the snakes crawl up into the tree, shed their skins, and leave them dangling like long streamers from the branches.

Venom is also extracted from poisonous toads and spiders at Butantan. The toads are lazy fellows, and sit all day in the shade of a tree. The spiders must be killed to extract their poison. This section of the Institute has a museum containing many different types of snakes, toads and spiders. Another museum contains plaster casts which show the effects of different kinds of bites and the emergency treatment for each.

There is still much to be learned about snakes and their poisons. And there are many places where they are being studied. But leading them all in this work is the Institute of Human Pathology at Butantan.

Word List

ANTI-TOXIN—A substance that protects a person from an infection or disease by neutralizing the effects of it.

BACTERIA—Tiny living organisms, some of which cause disease.

BACTERIOLOGY—The study of bacteria.

BUBONIC PLAGUE—A very dangerous, contagious disease with fever, chills, and swellings of the glands.

DOME-SHAPED—Shaped like half an orange.

FANG—Long, pointed tooth of a dog, wolf or snake; in snakes it is hollow.

IGLOO—An Eskimo hut that is shaped like a dome and built of blocks of ice.

IMMUNE—Protected against or able to resist a disease.

INJECTED—Forced a liquid into the body generally by a needle.

MOAT—Deep, wide ditch for protection, usually filled with water.

REPTILE—A cold-blooded animal that creeps or crawls—snakes, lizards, turtles, etc.

SACS—A small bag in an animal or plant, often one containing liquid.

SERPENTARIUM—Place where snakes are kept.

SERUM—Liquid used to prevent or cure a disease, obtained from blood of animal that has been made immune to the disease.

TOURNIQUET—A bandage tightened by twisting to stop bleeding.

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