SCIENCE TELLS US —

by René Bache

Solve Mystery of Gila Monster's Death Bite

IS THE bite of the Gila monster certain death? Or is there no evidence that anybody was ever killed by the poison of this mysterious lizard of the Arizona deserts? Science is perplexed at the wicked reputation of the Gila monster, which is not confirmed by the studies of scientific investigators.

Recently the statement was made by an investigator that, while the monster was probably devoid of fangs and poison glands, its bite was, nevertheless, deadly because of the infection sure to follow. He went on to say that the Gila has no proper digestive apparatus, wherefore such food as is taken into its system putrefies and this causes blood poisoning when one is so unfortunate as to become a victim of the lizard.

But scientific research by members of the University of Illinois makes it plain that the Gila monster is equipped with a good outfit of teeth and that they are always sharp and ample. The monster has a perfectly good stomach, which functions in a normal way. And besides this, the Gila monster has well-developed poison glands, which secrete a poison that is powerful enough to kill small animals.

In the study of this strange creature of the American desert it was discovered that there are many things peculiar to the Gila monster which are not found in any other poisonous lizard. In all poisonous snakes the poison glands are located in the upper jaw. The teeth, which are called "poison fangs," and which inject the venom, are situated in the front of the upper jaw. In some snakes these fangs are grooved at the back to carry the venom, but in the rattlesnakes and other deadly snakes the fangs are hollow tubes, which convey the venom with deadly certainty to the extreme tip. A poison gland is situated some distance behind the fang on each side of the jaw. From the gland a duct runs to the hollow fang.

When the snake opens its jaws to bite the fangs are erected and a muscle presses automatically on the poison gland, squeezing the venom into the fang. As the snake bites the poison pours down the hollow fang into the wound.

But the Gila monster's poison machinery is built on a totally different plan. His poison reservoirs are set in the lower jaw instead of the upper, as in the snakes. The poison oozes out in front of the teeth instead of coming from behind the tooth, as in the snake. The monster's poison finds its way up a groove in front of the first teeth, and this groove does not extend to the tip, as in the snake's tooth. He does not inject poison directly, as the snake does, but bites tenaciously, like a bulldog, and some of the venom is sure to find its way into the wound.

The outcome of a series of exhaustive tests conducted by authorities of the University of Arizona is that the bite of the Gila monster is a thing to be feared and avoided, although it is far from being as deadly as the Indians and some frontiersmen believe. It is not nearly so dangerous as the bite of the rattlesnake, about nine cubic centimeters of Gila monster venom being required to kill a cat. There is no reason to believe that a single bite from a Gila monster would kill a man, but a sufficient number of them undoubtedly would do so.

Blue Coal: A Plan for Utilizing the Moon's Great Energy Through Harnessing the Tides

Engineers Propose to Put To Work Power Now Wasted.

THE moon weighs 73,000,000,000,000 tons. It is a ball 2,163 miles in diameter, and its attraction is so great that it causes two great waves three feet high in the ocean on opposite sides of the earth to travel around the world once in 24 hours.

It is this wave that makes what we call the tides.

The energy thus developed is so enormous as to be incalculable, yet it serves no purpose useful to man. It is unlimited power going to waste.

If only a way could be found to harness the moon and put it to work! It is a problem which at the present time is exercising the minds of many clever engineers, and in a measure they think they have solved it.

A gigantic tide-power development is soon to be undertaken at Hopewell, N. B., on the Bay of Fundy. The French have in view a similar engineering enterprise at St. Malo, on the Rance river. In England the Severn is to be dammed and its tidal waters utilized for hydro-electrical power on so huge a scale that the plant is expected to surpass Niagara as a producer of energy for industrial purposes.

Falling water has been called "white coal." Tide water available for power production has newly acquired an equally picturesque name —"blue coal."

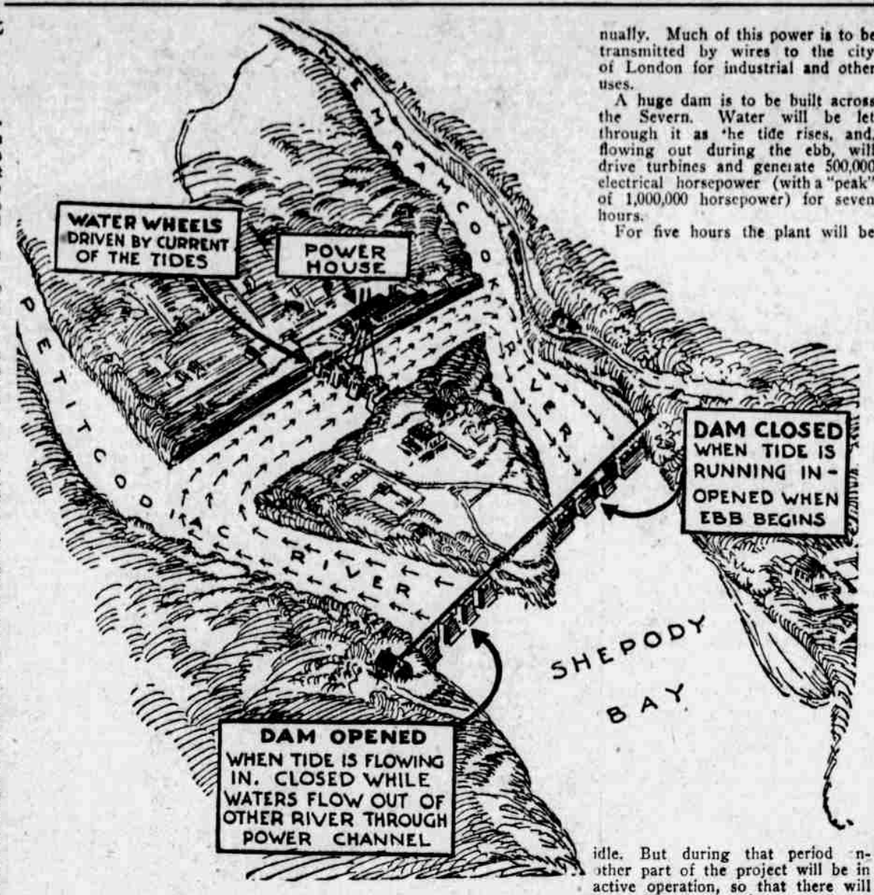
Engineers as yet find tide-power developments practicable only where the tide enters an estuary and, with a piling up of the water, rushes with violence up the channel of a river. This phenomenon is called a tidal bore. It is conspicuously illustrated in the Bay of Fundy, where tides reach a height of 70 feet; on the Rance (at St. Malo), where they rise 45 feet, and on the Severn, where they exceed 30 feet.

If the water thus pushed up the river be captured in reservoirs, and allowed to flow out of the latter during the ebb, it can be made to drive turbines and generate electricity. With the adoption of suitable expedients the output of power may be rendered continuous throughout 24 hours.

The water-wheel for utilizing steam power is undoubtedly of prehistoric origin, yet not until very recently has it been transformed into an apparatus employing turbines and generators for the production of electrical energy.

Tide mills are very old. They were in use in England as early as the 11th century; likewise in Brittany, and in China, where it is quite likely they originated. They were employed for grinding grain, and sometimes as sawmills. Such mills were formerly operated—perhaps some of them are still running—on th coast of New England, in places where a tidal inlet could be conveniently dammed, with a pond to hold the water that flowed in on the rise of the tide.

Power for such a mill is derived from the flow of water into the pond and out again, driving a large paddle-wheel like that of an old-fashioned steamboat. A special arrangement is required to raise and lower the wheel to suit the rise and fall of the tide. Bevel gear at each end of the wheel-shaft transmits the power, the pinions being free to slide up and down two vertical spindles.



Here, then, is again the primitive water-wheel, upon which, for the utilization of tide power, we have not up to now made any improvement. But, in the belief of competent engineers, there is no reason why it should not be developed, in suitable localities, into a hydro-electric plant, with turbines and generators, the problem being relatively simple, although, of course, an outfit of the kind must be on a very large scale and costly.

Place the power plant between two channels connecting the sea with a reservoir basin. Let one channel be closed while the basin is filling, and the other while the basin is emptying. Thus, by the help ot turbines, the flow of the tide can be utilized coming and going. Here you have the idea presented in simple form.

At Hopewell, N, B., two rivers, the Memramcook and Petitcodiac, join and empty into an arm of the Bay of Fundy. They need only to be dammed in order to provide natural reservoirs. Tides there are very regular, varying from 38 to 45 feet. The flood pours up the rivers nearly six hours and flows back during six and half hours.

According to plans which have been worked, out, a dam 4,900 feet long is to be built across the Petitcodiac, and another dam 4,800 feet long to span the Memramcook. A wing dam 900 feet in length will connect the two. The power station will be on the wing dam.

Along the tops of the dams will be a road to facilitate shore-to-shore communication with a trolley line operated by the plant. To pass vessels up and down the Petitcodiac the gates of a lock will be swung open by electric power at times suitable to the tides.

The initial cost of the development is estimated (for 90,000 horsepower) at $11,000,000. At a future time, when more power is needed, expansion of the works will increase it to 200,000 horsepower. The site, central to a present population of 250,000, is deemed ideal for the purpose, and it is believed that at Hopewell the world's first great tide-power enterprise will be brought to fruition.

In France a blue coal commission, appointed by the government, is studying the problem of tide-power utilization at several estuaries along the coast. Practical work in this direction is being done at two experimental stations in Brittany. It is believed that tidal hydro-electric developments on the Rance river, at St. Malo, will go far toward making impossible a paralysis of French industries by another invasion from the east and north.

In the meantime, in England, a gigantic development of this kind is planned for the Severn river, which it is estimated, will furnish power equal to that obtainable from the burning of 8,500,000 tons of coal annually. Much of this power is to be transmitted by wires to the city of London for industrial and other uses.

A huge dam is to be built across the Severn. Water will be let through it as the tide rises, and, flowing out during the ebb, will drive turbines and generate 500,000 electrical horsepower (with a "peak" of 1,000,000 horsepower) for seven hours.

For five hours the plant will be idle. But during that period another part of the project will be in active operation, so that there will be no interruption of the power supply.

Ten miles away, near the Wye river (which flows into the estuary of the Severn) a great high-level reservoir will be constructed, with a power and pumping outfit.

Surplus power from the Severn plant, during the hours when the latter is working, will pump water up into the reservoir through a tunnel (driven through solid rock) a mile long and 40 feet in diameter.

When, at the end of the ebb, the Severn plant ceases to operate the water stored in the reservoir will be allowed to flow out and downward through the tunnel, driving turbines which will operate electric generators, producing half a million continuous horsepower during the hours while the Severn plant is idle.

The total power developed will be consistently greater than is derived from all the hydro-electric developments of Niagara.

Fruit From Cacti

The newest achievement of Burbank, the plant wizard, is the production of cacti that bear fruits beautiful to the eye and with flavors resembling those of peaches, muskmelons, pineapples, etc., yet sufficiently unlike to render them appetizing novelties. They are very sweet, containing from 12 to 16 per cent of sugar.

These fruits may be eaten fresh or put up as sweetmeats. They are of various colors.

Don't Run Engine In Garage Not Ventilated

DURING the approaching winter quite a good many people will be poisoned to death by exhaust gas from their own automobiles. They will run the engines in the garage, with door and windows closed, and, before they know it, will be overcome by the deadly carbon monoxide.

If accidents of this kind are to be avoided motorists should see that the garage is well ventilated before permitting an engine to run for any length of time.

This advice is urgently offered by the United States Public Health service, which has been making a special study of the subject, with experiments on human beings, dogs and other animals. To make the tests as practical as possible, a building about the size of an average private garage was erected—10 by 10 by 20 feet—and the engine of a small car was set going inside of it.

It was found that the engine discharged approximately 25 cubic feet of exhaust gas per minute, and that 6 per cent of it was carbon monoxide.

The "hemoglobin," or red coloring matter of the blood, contains iron, and owes to that metal its power to take up oxygen from the air breathed into the lungs. There is enough hemoglobin in the body of an average man to hold 13 pints of oxygen. But every molecule of carbon monoxide taken into the lungs and absorbed by the blood replaces a molecule of oxygen.

Hemoglobin attracts carbon monoxide 300 times as strongly as it does oxygen. Thus the poison gas, when breathed, rapidly crowds the oxygen out of the blood, and in a remarkably short time the victim is overcome.

Experiments made by the public health service showed that three parts of the gas in 10,000 of air produced no perceptible effect. Six parts caused discomfort. Nine parts induced headache and nausea. Fifteen parts or more meant danger of death.

If a car, while "warming up," should give off only one cubic foot of carbon monoxide in a closed room of the size above mentioned, the atmosphere would become dangerous to life in three minutes.

When a person is overcome by carbon monoxide, don't send for a pulmotor. Get him into the open air. Fresh air and lots of it is what he needs. If he is not too far gone the oxygen he takes into his lungs will drive out the poison gas in an hour or two.

Wolves Move East

SETTLERS of early days in the eastern part of the United States had much trouble with wolves. Persistent warfare against them brought about their practical extermination in that section, though there are still plenty of coyotes and the more formidable timber wolves in the west.

Within the last few years, however, the wolves have been moving eastward, and of late they have been preying on sheep and other live stock to an alarming extent in Michigan, Wisconsin, Oklahoma, Arkansas, Missouri and parts of Iowa.

Losses have become so severe that appeals for help have been addressed to the federal government, and the biological survey is sending expert trappers to the afflicted regions to combat the mischief.

Introducing Comb And Brush in One

WHY bother to use a brush and comb when one can have the two combined in one instrument?

Theodor Koglowsky of Toledo, O., is the inventor of a device that solves the problem. So far as the brush is concerned, it is like any other; but the back of it carries a comb which, when wanted for use, is made to slide outwardly and into operative position by pressing a small arm.

When the comb is not wanted another touch on the little arm causes it to slide again into the back of the brush out of the way.

For additional convenience, the brush handle is provided with a mirror. Thus the affair is three things in one—brush, comb and looking glass. As a convenience for travelers it ought to be worth while.

Pineapple Products

THE pineapple growers of Hawaii, anxious to encourage new uses for their product, are now putting the fruit up in cans, crushed or grated, as well as sliced.

Grated or crushed pineapple is beginning to find favor as an ingredient of sodas and sundaes. Pineapple pie, made with the fruit thus prepared, is declared excellent.

Prohibition has given a great boom to the soft drink trade, and anything new and tempting in this line is in demand. A St. Louis brewery is putting on the market a carbonated coffee beverage and a carbonated tea beverage, in bottles.

Eggs Boiled in Oil

A NEW method of sterilizing eggs, as a preliminary to cold storage, consists in immersing them for five seconds in an oil solution at 250 degrees Fahrenheit. This brief exposure to a heat considerably above the boiling point of water is sufficient to kill not only whatever bacteria the eggs may contain, but also the vital principle in those of them that are fertile.

Electrical machinery does the work. It is claimed that the eggs are in no way injured by the treatment.

Carnegie Hired a Chemist and Won Wealth

HERE is a story that has never been told in print. It tells how Andrew Carnegie made his first $1,000,000.

He was the first ironmaster to hire a chemist. We all know how much chemistry has had to do with the development of steels, but at that period, when the shrewd Scotchman was young, possibilities in that direction had not begun to be realized.

In Europe there was introduced the so-called "Thomas basic process," which made possible the use of high-phosphorus iron. Previously iron that contained much phosphorus was not available for making steel because the product was brittle.

The process in question overcame the difficulty. Carnegie, through his chemist, got news of it, and he lost no time in securing exclusive rights to its use in the United States.

At that time the great deposits of the Lake Superior region had not been discovered, and we were getting most of our iron ores from Pennsylvania and New Jersey. Carnegie saw that the new process would make available the iron beds of the Appalachians, where the ores are high in phosphorus, and he secured options on all the best of them. Soon afterward he sold these options at a clear profit of $1,000,000.

It was simply a matter of being one jump ahead of everybody else, and Carnegie was able to accomplish this through his wisdom in hiring a chemist.

The Gazing Bowl

IN FORMER days a method of divination often practiced by magicians was to pour a little puddle of ink into the palm of a person's hand, the bright surface thereof showing reflections of things that were going to happen, or else of occurrences actually taking place at a great distance.

An important improvement on this idea is a "gazing bowl," which has been patented by Leo M. Anderson, of New York. It ought to yield valuable results when used in connection with the ouija board.

The bowl is broad and shallow, preferably made of copper or brass, and lined with glass. The metal beneath the glass, however, has a variegated coloring, bestowed by treatment with an acid.

For use, the vessel is filled with water, its interior brightness helping to render the surface of the fluid brilliant with varying reflections.

Seeking visions, the user concentrates his gaze upon the surface and waits. If he has a proper faith, they are sure to come.

Motor Stethoscope

IF YOUR automobile engine is not running as it should, and you do not know what the trouble is, get one of the new biaural stethoscopes and make a diagnosis, as a physician does when he wants to learn what the trouble is with the interior machinery of his patient. This improved device for detecting faults in running machinery has the advantage of possessing two earpieces which entirely exclude external noises. It has a jointed rod which is placed upon the part where the noise is suspected to be, and the noise is so magnified that the location and nature of the trouble can be quickly determined.

Long Chances In the Animal Dealer's Game

(Continued From Page Four.)

ing forward as rapidly as he could get foothold. He put his head against the wall and rooted; the wall toppled over and he lurched out of the pit and into the cage. The natives slipped the end-bar into place.

The capture was finished—but not the work. A rhinoceros cannot be broken and driven through the jungle like an elephant; he must be hauled every foot of the way. With the six water-buffaloes straining and every native giving a hand, we pulled the cage up the incline and mounted it on the runners. It took a week of steady cutting to clear the way, so that we could drag the cage to the Trengganu river. There we built a heavy raft and floated the cage down to port. Another two weeks passed before we could ship the beast to Singapore, for transshipment to Perth.

I received for the animal £200, which was about one-quarter of its value. But it was as much as the Perth Zoological Gardens could afford to pay, and I was glad to be able to put so fine a specimen into the hands of Mr. La Seuf.

One day when I was busy in my animal house, Ali came to me with the message that three natives from Pontianak, Borneo, were outside. They had something important to tell me, Ali said. When they came in, I found that I knew one of them; he was an animal trader from whom I had bought some birds and monkeys. The other two were headmen from the interior of Borneo.

The headmen had gone to the trader with the story of two large orang-outangs that were terrorizing their villages, and the trader was bringing them to me for advice. We sat down in the shade and discussed the situation. The orang-outangs had run off with a young girl and had recently killed one of the men. The natives had tried repeatedly to kill them, but without success, and now they were afraid to venture into the jungle.

For several years I had had a standing order from the Antwerp Zoological Gardens for a good specimen of orang-outang, and I had planned to go, just as soon as my health permitted, into Borneo, to see what I could find. Orang-outangs command unlimited prices because they are so hard to capture and, once captured, so difficult to deliver. On account of homesickness and sensitiveness to climatic changes, they die quickly in captivity. A caged orang-outang loses his spirit immediately; he sits brooding over his capture and often refuses all food. On one occasion I shipped 18 small and medium-sized orang-outangs to San Francisco, hoping to land two or three alive, but they all died before reaching port. If I had been able to deliver a good specimen in the United States I could have sold it for $5,000.

But here were two full-grown beasts already located, and waiting for me to try my hand at capturing them. I was greatly interested in the story the two headmen had to tell, and I spent the entire afternoon in listening to them and asking them all manner of questions. They described the country where the orang-outangs made their home, and promised as many men as I needed.

When I went to see the Dutch consul general and explained the situation, he issued passports for me, and, accompanied by two headmen, the trader, Ali and my coolie boy, I took the next steamer for Pontianak. At Pontianak, I presented my credentials to the Dutch resident. He was pleased to hear that I was going after the orang-outangs and he offered to let me have as many native officials as I wished to take along. I thanked him and declined his offer, explaining that I really did not know as yet just what I should need, or how long I should be up country. As a matter of fact, I did not want his native officials because I knew that the jungle people would have no love for them, and I wanted to have my expedition entirely clear of everything that looked official.

We stayed there for several days, getting supplies together. The trader remained with my party at my request, because he was known by both the coast and the jungle people. From a Chinese he rented a house-boat that I could keep as long as I had need of it. The Borneo house-boats are 20 to 25 feet long and five feet wide; they have a bamboo shed, which makes a fairly comfortable room, and are rowed or paddled by six men. With a mattress spread on the floor and mosquito netting hung about, I could take the trip up the river easily. Omar, one of the headmen, stayed with me in my boat, while Mahommed Munshee, the other headman, went ahead with some of the stores.

On the way up the river we came to the station of Dr. Van Erman, the Dutch medical officer, who was in charge of the outlying districts.

We arrived at Nanoah-Pinoh, which was Mahommed Munshee's village, two days late. I stayed at Munshee's house while the men prepared boats for the trip up the Melarir river to the spot where the orang-outangs were.

(Another Charles Mayer jungle story next Sunday.)

Rich Deposits of Guano Found in Austrian Cave

Paris, Nov. 12.—One of the most important deposits of guano in the world has been discovered in a series of caves near Mixinx, Austria.

Bats were seen flying out of the cavern one night by a farmer, who entered and discovered the guano. Hearing that the deposits were worth approximately 40,000,000 crowns, the Austrian government promptly confiscated the cave and announced the guano industry was henceforth a state monopoly.

Twenty-Four Lessons in Piano Playing--First Lesson: D Major

The Bee starts today publication of a series of 24 practical lessons in piano playing, prepared by W. Scott Groves. The lessons will give you a thorough course of instruction, beginning with fundamentals and showing you, in turn, all the phases of piano playing. One lesson will be published each Sunday. These carefully prepared lessons furnish you an easy, practical, inexpensive way of acquiring piano instruction. You will find it interesting to follow them and by the fifth or sixth Sunday will be surprised at your progress.

GROVE'S MUSIC SIMPLIFIED.

Lesson No. 1

This home course in music consists of twenty-four illustrated lessons, the chart here presented representing the first lesson of the series. In the other lessons charts will be produced showing a complete series of chords in all keys, both major and minor. This system of teaching embraces a general and practical method of instruction. It teaches the notes and letters in the transpositions of the different keys and embodies the principles of harmony and thoroughbass. Learn the first lesson thoroughly before taking up the study of the second.

INSTRUCTION—Place chart upon the keyboard of the piano or organ so that the small white letter D with a dash above it, at the bottom of the chart, is directly over the key D on the keyboard. The white and black spaces will then correspond to the white and black keys. Each of the three horizontal series of letters represents a chord. Beginning with the upper row, play the white letter or note with the left hand and play the three black letters or notes with the right hand, making the first chord. Then, in the same way, play the notes indicated in the second horizontal series, then those in the third and back to the first, forming a complement of chords in D Major.

The first things necessary to become a good player are patience and practice. Before the next lesson the chord shown should be played over and over again until you memorize it and can play it without the chart. Memorize the letters also. You will soon find you will be able to play simple accompaniments in this key to any melodies you or your friends may sing.

If you wish to go further in studying, learn the fingering of the scales shown on the staff in each chart, upper notes played with right hand, lower with left hand. The chords at the end of the staff you will find are the chords you already have learned, but with the upper notes inverted. They can be rearranged in still another way. Try to find this way, but remember that the notes in the bass always remain the same.

Every triad in black letter is marked 1, 3, 5. Always read it so, no matter in what vertical order the notes may be written. Note that the small letter D with a dash above it must not be played.

Never play small white letter D with dash above it.

NEXT LESSON—B Minor, which is the relative of D Major.