

the stronger muscles will pull the weak ones out of shape and the deformity will be worse and harder to correct.

Muscle training or reeducation should not be started until pain or tenderness in the muscles has disappeared. After all tenderness has gone, the physician will make a careful examination to detect which muscles are affected. Then he will prescribe the exercises for training and strengthening the affected muscles.

Nerve Cells Destroyed

In infantile paralysis, certain nerve cells supplying a muscle are destroyed. Those that are left are not used to working together and do the job badly and without coordination. By proper exercises these nerves can be trained to work together with precision. The exercises not only improve the coordination of the nerves but improve the nourishment of the muscle fibers.

Muscle training should be done only under the direction of a trained person who understands muscle function. It should be carried out gradually. Over-fatigue must be guarded against. Swimming does not take the place of localized muscle training. Exercises can be done more pleasantly and easily under water but the same exercises done on a table will produce equally good results.

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At the recent children's festival in Moscow, the zoo gave young visitors 15,000 "live presents" including parrots, squirrels, and fox cubs.



DR. CARLOS DE LA TORRE

This Cuban naturalist has accounted for the presence of Cuban land snails in Florida.

SURGERY

Delicate Surgical Operation Enables the Deaf to Hear

Only One Type of Deafness, Otosclerosis, Is Improved And Only the Skilled Can Undertake New Technique

A DELICATE surgical operation which promises the seeming miracle of making the deaf hear again has been reported by Prof. Maurice Sourdille, of the School of Medicine at Nantes, France, to the New York Academy of Medicine in New York.

The feat has been accomplished by special technics developed by Prof. Sourdille. The new operation will not bring hearing to every deafened person. Even those shown by careful tests to have a hearing defect suitable for correction by this operation can not hope to have the operation performed at present.

Much study of the method and of results so far accomplished are necessary before the operation will be performed universally on a large scale. This caution was made perfectly clear by both Prof. Sourdille and Dr. Edmund Prince Fowler of New York, who acting as chairman of the meeting, introduced Prof. Sourdille.

One of the chief obstacles to immediate application of the new technic on large numbers of patients is the difficulty of performing it. Prof. Sourdille uses both magnifying glasses and microscope in this operation. Complete and permanent loss of hearing and even death may result if the surgeon has not the necessary skill. The operation must be performed in three or four stages, several months apart, in order to lessen this danger, and the patient must remain in a hospital in order to have the wound dressed every day.

Another obstacle is the difficulty of selecting suitable cases. The operation is designed to relieve deafness due to otosclerosis, the condition in which hearing is lost because of bone formation in the opening into the inner ear. This prevents the passage of sound waves from the outside to the nerves of hearing in the inner ear.

Prof. Sourdille's operation provides a new circuit for the sound waves. He cuts a hole through the bone into the inner ear to provide a substitute passage for sound in place of the one

blocked by the abnormal formation in otosclerosis.

This has been done before by other surgeons, and the patients heard again, but the restored hearing was often not permanent. It lasted for a few days or at most months, because the new opening closed up. To overcome this difficulty, Prof. Sourdille has devised a method of covering the new opening with a flap of scar tissue obtained from the ear canal. These procedures permit the sound waves to go through to the nerves of hearing but keep the new opening from closing. Some of the patients operated upon by Prof. Sourdille have retained the improvement in hearing for as long as eight years, which is the longest interval since he performed the first successful operation by the new technic.

In properly selected cases good results can be expected in from 70 to 80 per cent., Prof. Sourdille said. No other method, either surgical or medical, has ever before been so successful in maintained restoration of hearing in proved cases of otosclerosis, it was pointed out.

This condition of abnormal bone formation in the inner ear exists in 1 out of every 20 adults. Less than one-fourth of these, however, are deafened by the condition. Not all otosclerosis patients are deaf because of the otosclerosis. Other defects which may exist along with the otosclerosis are responsible for the deafness in some of the cases. It was pointed out that treatment which restores hearing is sometimes effective because it clears up these other conditions. Consequently physicians, although impressed by Prof. Sourdille's results, are inclined to temper their enthusiasm with caution. Patients are warned not to insist on the operation unless tests show they will benefit from it, and unless skilled surgeons are available.

More important, perhaps, than the benefits received by the 140 patients whose hearing was improved by Prof. Sourdille is the fact that his work opens a new field of research into the causes of otosclerosis. Some of his results sug-

gest that the old theories of the cause of the condition do not correspond with the facts. Much new study will be necessary to finally determine the causes of otosclerosis, but when these are advanced, new methods of treatment and even of prevention may be hoped for.

Prof. Sourdille, who was awarded the Croix de Guerre for his four years' service with a surgical unit of the French Army during the World War, has labored for twelve years, in the face of great discouragement, to perfect his new surgical technic. He has changed the picture of hopelessness for many patients. No other medical or surgical treatment has given heretofore such a hopeful outlook.

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ther blessed by the presence of a full moon, which enveloped the canyon in a pattern of silvery light and deep shadows and added greatly to its sense of awe and mystery.

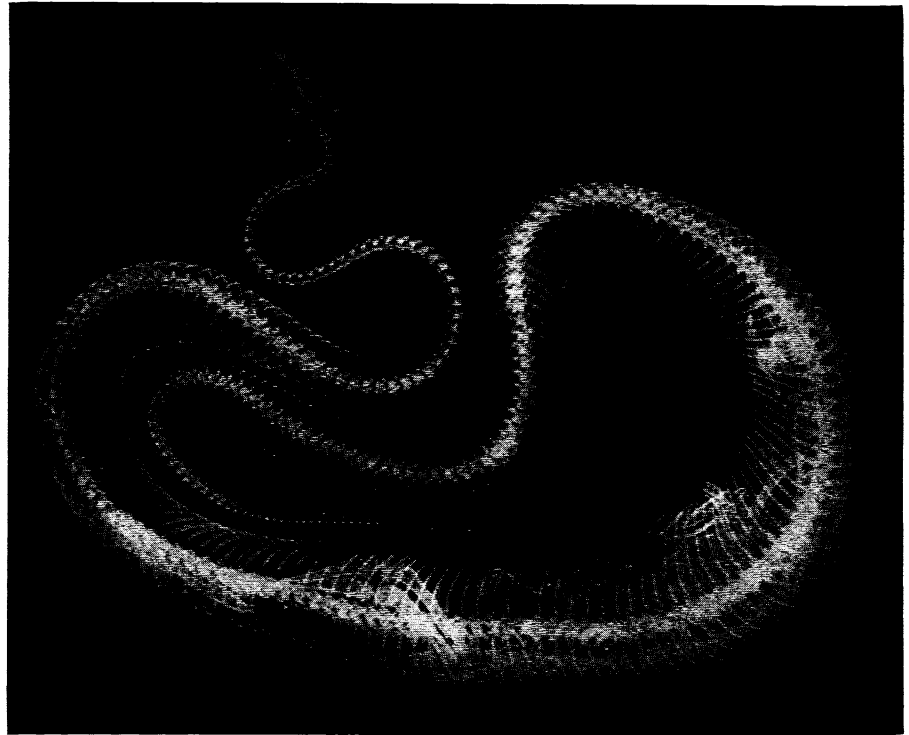
We had a visit from a coyote, which probably smelled our campfire, for shortly after the rainstorms we found a fresh track of the animal in the mud.

Yet in spite of the apparent comings and goings of animals such as the deer, Shiva Temple, carved out on its south side by the Colorado River and on the north side by rock falls and erosion, is a separate world to the small animals isolated from the mainland.

Physical separation from the canyon rim and environment obstacles between the top of Shiva and the rim of the canyon are the two types of barrier which can and do stop small animals like mice and other rodents from crossing to and fro. The physical inaccessibility of this sky island is sufficient to prevent the passage of many land animals.

Climbing rodents such as chipmunks can scale the cliffs with ease and they constitute no physical barrier to them, but the environmental obstacles are effective.

Any animal leaving Shiva to cross to



BABY BOA BOLTS BUNNY

This is no alliterative joke. Mexicans value young boa constrictors because the snakes eat insects and rodents. When this baby ate a rabbit intended for Mama Boa, its owner sent it to a doctor and X-ray apparatus in California to make sure the rabbit was following the proper pathway of digestion. This X-ray photo was the result.

the North Rim by way of the saddle must drop down 1,100 feet into a distinctly different type of environment, which may be not only unattractive but actually hostile to it. As long as food and living conditions on Shiva are attractive to one of these small rodents capable of climbing up and down the physical barrier there is no incentive for it to leave, especially if the only highway open to it is less attractive than the place it is leaving.

Such a barrier as this environmental one is for many kinds of animals just as much a hurdle as a broad expanse of water is to an animal that cannot swim.

We rather expect therefore that the study of the mammals we have collected on Shiva will show that these two types of barriers have left their impress on the character of the animals found on the plateau.

Mark of Isolation

The paleness is a mark of this isolation. If darker animals from the mainland could invade Shiva, by interbreeding they would dilute the tendency toward lighter coloration. But that ten-

dency toward paleness has apparently not been so diluted.

The beginning of our first day atop Shiva, Friday, Sept. 17, did not find us settled for our work by a long shot, but by sundown we were fairly well organized.

When we took stock after a rather meager breakfast out of cans, we found we had exhausted our water supply. Our greatest need was to see that some was started up to us at once from the camp on the saddle, where a water supply had been established the day before.

Shouted from Pinnacle

It was on this morning that I shouted down from a pinnacle some fifteen hundred feet in an airline from the camp that we had not a drop left. Superintendent Tillotson was talking to the South Rim over his portable radio transmitter at the time.

And, I am told, the two-way conversation between us was picked up by the microphone. I do know that press reports for that day declared that Dr. Anthony had sent down from the cliffs above "plaintive calls" for more water.

This day saw the termination of most

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