

MEDICINE

Insert Plastic Thigh Bone

Diseased natural bone in the thigh of a boy was replaced by a polyethylene plastic to which the tendons and muscles were attached.

► A SUBSTITUTE thigh bone, carved from a block of polyethylene plastic, has been successfully substituted in the leg of a 12-year-old boy for the natural bone which had to be removed because of disease.

The "formidable" two-hour-long operation in which the boy's own bone was "filleted" out of his leg and the plastic substitute attached to muscles, was performed by Dr. H. J. Seddon, of the Royal National Orthopedic Hospital in London, assisted by John T. Scales, of the Institute of Orthopedics, also of this city.

The boy had for a long time suffered from the abnormal bone condition called chondromatous dysplasia. The inner, longer leg bone below the knee as well as the thigh bone was affected. The surgeons had agreed that amputation through the hip joint was the only satisfactory treatment.

"But an artificial limb for such an amputation is at best a poor affair," they state in their technical report in the *LANCET* (Oct. 29), "and we welcomed the suggestion made by Mr. K. I. Nissen that an attempt should be made to amputate the limb through the middle third of the thigh, fillet out the femur (thigh bone), and substitute for it a plastic model of its upper half or two-thirds."

The polyethylene plastic was chosen because of its stability and high resistance to chemical change, its considerable toughness and resistance to fatigue strain and its non-wettable surface which living tissue does

not stick to. Its safety for use in the body had already been learned through animal experiments.

Precise measurements of the normal thigh bone were first made with very carefully taken X-ray pictures. The plastic substitute was carved to these measurements. When finished it weighed seven and one-half ounces and was eight inches long. Channels were made in it so that tendons from hip and other muscles could be slipped through, to attach the substitute thigh bone to muscles. This gave some chance of its being well controlled by the more important muscle-groups. A good fit of the head of the thigh bone to the hip was obtained by filing its surface after a preliminary fitting during the operation.

The boy's own thigh bone was dissected out by peeling off the muscles by diathermy cutting, or an electric knife as it is sometimes called. The muscles not attached to the plastic substitute bone were stitched together.

Two pints of blood were given during the operation and another pint after it. Penicillin and later streptomycin were given to control infection which was feared because of the "enormous" area of tissue exposed during the operation.

Less than two months after the operation, the stump had become normal, the boy had been fitted for an artificial leg and was walking on a temporary "pylon."

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promptly relieved by ACTH and the cancer decreased by 90% in size, but microscopic examination of a tiny bit of the tumor tissue showed that cancer cells were still present.

Another was a woman with severe skin trouble, sore mouth, loose teeth associated with glandular disturbance. ACTH helped her, too, but her symptoms gradually returned after the treatment was stopped. This was also true of the other two patients who had rheumatoid arthritis.

The five patients had such different conditions, affecting such different cells of the body, that the results suggest ACTH "works through a fundamental biochemical system of the body to affect the metabolism of all the cells," the scientists conclude.

ACTH is a hormone from the pituitary gland which acts to stimulate the adrenal gland, producer of cortisone, which has brought relief to rheumatoid arthritis patients. Both chemicals are so scarce that only tiny amounts are available for medical research.

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Words in Science— KALEIDOSCOPE-STEREOSCOPE

► TWO instruments which used to be very popular for amusement in our grandparents' parlors were the kaleidoscope and the stereoscope. Both are viewing instruments.

The kaleidoscope—you say it ku-lye-doe-scope with the stress on lye—makes use of mirrors to make tiny bits of colored glass appear as beautiful symmetrical designs which are forever changing as you turn the instrument.

The stereoscope—pronounced ster-ri-oh-scope with the accent on ster—is an optical instrument which blends two views of the same scene, taken from slightly different positions, so that they appear as one three-dimensional view. With the stereoscope Grandmother used to enjoy life-like views of Niagara Falls.

Science News Letter, November 19, 1949

MEDICINE

Hormone Aids Mental Ill

► THE 50-year-old woman was despondent and wanted to kill herself. She thought people were plotting against her, casting "spells" over her, poisoning her food, filling her room with poisonous fumes. She felt nervous and very weak.

At the hospital they gave her a dose every six hours of ACTH, hormone chemical which has gained fame for relief of rheumatoid arthritis sufferers. After four days the doctors stopped the ACTH because there was no more available. But the woman was strikingly improved. She smiled and said she felt better. Her delusions of people plotting against her still persisted.

A week after she left the hospital these delusions abruptly stopped. She went back to work as a domestic servant for her former employer who said "she is like her old self again."

Whether the ACTH brought her out of the depression and mentally sick state or whether her recovery just happened at the same time is not known. So far, two months after treatment, she has not had any further symptoms of her sickness.

Her case is reported by Drs. Tom D. Spies, Robert E. Stone, Samuel Dreizen and Benjamin F. Morton of Northwestern University Medical School, Chicago, and the Nutrition Clinic of Hillman Hospital, Birmingham, Ala., in the *SOUTHERN MEDICAL JOURNAL* (Nov.).

Her case is not reported as a cure. She was chosen along with four other patients for short-term treatment with the scarce ACTH in studies planned to see what the hormone chemical might do in disorders of the aging process.

One of the patients was a 60-year-old man with cancer of the lip. Sensitiveness was

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