

# Wilder Penfield

## Explorer of the Human Brain

**A great surgeon relieved the suffering of hundreds of epileptics and gave us rare insight into the mysteries of the mind**

**By Murray Teigh Bloom**

From the gallery of the Montreal Neurological Institute's main operating room I witnessed a seven-hour brain operation performed by one of the world's great neurosurgeons, Dr. Wilder Penfield, whose work has uncovered important clues to the intricacies of the human nervous system.

The patient this day is a 29-year-old New England salesman whose severe and frequent epileptic seizures have prevented him from working regularly. Dr. Penfield is his last hope.

The pace in the operating room is deceptively relaxed and leisurely. Under a local anesthetic a flap of the patient's shaven scalp is formed by a curved incision, a door of skull is sawed out, and turned back with the scalp flap and held by retractors. Now the dura, the filmlike covering of the brain, is opened and a section of the brain about the size of a saucer lies exposed, convoluted gray traversed by throbbing red arteries. The brain itself is a three-pound mass of pink-gray jelly, composed of some ten billion cells.

Sitting nearby, when he is needed, is a key member of Dr. Penfield's team, Dr. Herbert Jasper, a leading electroencephalographer. It is his job to interpret the hill-and-dale lines inked by the pens of a machine registering electric currents generated by the brain as the surgeon touches it at various points. The patient is conscious throughout.

Dr. Penfield's probing electrode touches a spot on the cortex, the gray matter. "I felt something in my thumb and forefinger," the salesman says. A tiny sterile tag numbered 1 is dropped on the spot on the cortex.

The electrode touches other spots, and tags are dropped in place for each reaction. Thus the brain areas controlling the patient's lips, jaws, eyelids, nose and chin are identified. The gentle but relentless probing goes on. Suddenly at tag 26 we hear the epileptic say, tensely: "I had a warning of an attack just then—the strongest one yet."

With tag 30 the electrode probes deeper into the yielding gray matter. "This is it," the patient gasps as he stiffens. On the electroencephalograph we can see the vivid "spike" markings produced by a small epileptic seizure. In a minute it is over.

The hours pass. Gradually the area of the brain's temporal lobe in which this man's attacks start becomes clearly defined. Fortunately it does not include any areas of important or vital functions such as sight, hearing or breathing. Now the diseased tissue, hard and rubbery, is carefully removed with a metal suction device.

Seven hours after the operation began Dr. Penfield sews the dura with a curved needle. An assistant takes over to replace the retracted skull flap. Another epileptic has a good chance of being reclaimed for normal living.

Dr. Penfield, as director of the Montreal Neurological Institute, probably the world's leading center for neurological surgery and research, performed that operation hundreds of times. During one of his early pioneering operations, in 1931, he stumbled upon a patient's invisibly recorded past—his probing suddenly brought forth from the patient an account of a long-forgotten