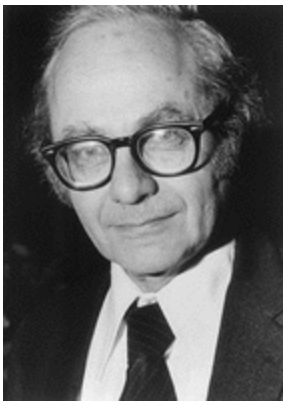

Autobiography

I was born in 1926 in Windsor, Ontario. Three of my grandparents were also born in Canada: the fourth, my paternal grandfather, emigrated as a child to the U.S.A. from the Bavarian town of Nördlingen. He became a pharmacist and achieved some prosperity by inventing the first process for the mass producing of gelatin capsules. My parents were born and raised in Detroit, Michigan. My father, a chemical engineer, took a job across the Detroit River in Windsor, Ontario, became tired of commuting from Detroit, and finally moved to Canada. When I was born I acquired U.S. citizenship through my parents and Canadian citizenship by birth. (When it comes to prizes I don't know whether each country gets half credit or both get full credit.) In 1929 my father moved to Montreal, where I grew up. From age six to eighteen I went to Strathcona Academy in Outremont, and owe much to the excellent teachers there, especially to Julia Bradshaw, a dedicated, vivacious history teacher with a memorable Irish temper, who awakened me to the possibility of learning how to write readable English. I owe much of my interest in science to my father, whom I plagued with endless questions. To my mother goes much of the credit for encouraging me to work for whatever objectives I set for myself. As a boy my main hobbies were chemistry (my friends, who consider me utterly ignorant of that subject, will be richly amused) and electronics. I soon tired of the electronics because nothing I built ever worked. But with chemistry I discovered potassium chlorate and sugar mixture and set off a small cannon that rocked Outremont, and I released a hydrogen balloon that flew all the way to Sherbrooke. At McGill College I did honors mathematics and physics, partly to find out why nothing worked in electronics, but mainly because it was more fun to do problems than to learn facts. I still much prefer to do science than to read about it. I graduated in 1947 and, almost on the toss of a coin, despite never having taken a course in biology (even in high school, where it was considered a subject only for those who could not do Latin or mathematics) I applied to Medical School at McGill. Rather to my horror I was accepted. At first I found it very difficult, given my total ignorance of biology and the need to memorize every muscular insertion in the body. I spent summers at the Montreal Neurological Institute doing electronics (I now had the theoretical basis but still no talent with a soldering iron) and there I became fascinated by the nervous system - small wonder considering that this was the period of culmination of the work of Penfield and Jasper. To my surprise I also found I enjoyed clinical medicine: it took three years of hospital training after graduation, (a year of internship and two of residency in neurology) before that interest finally wore off. The years of hospital training were interrupted by a year of clinical neurophysiology under Herbert Jasper, who was unequalled for his breadth and clarity of thinking in brain science. On setting foot into the United States in 1954 for a Neurology year at Johns Hopkins I was promptly drafted by the army as a doctor, but was lucky enough to be assigned to the Walter Reed Army Institute of Research, Neuropsychiatry Division, and there, at the age of 29, I finally began to do research. One then had little of the feeling of frenetic competition that is found in graduate students today; it was possible to take more long-shots without

becoming panic stricken if things didn't work out brilliantly in the first few months. We were not free from financial worries, as graduate students in biology by and large are now; until I entered the army my income was close to zero, and I owe a huge debt to my wife Ruth for supporting us through those lean and exploited years of residency and fellowship training.

Scientifically, I could hardly have chosen a better place than Walter Reed. In the neuropsychiatry division David Rioch had assembled a broad and lively group of young neuroscientists, notably M.G.F. Fuortes and Robert Galambos in neurophysiology, Walle Nauta in neuroanatomy, Joseph Brady and Murray Sidman in experimental psychology and John Mason in chemistry. As in Montreal, the focus was on the entire nervous system, not on a subdivision of biological subject matter based on methods. I worked under the supervision of Fuortes. We began by collaborating for six months on a spinal cord project, and it was then that I had my only apprenticeship in experimental neurophysiology. Fuortes had a genuine feel for biology that was rare among neurophysiologists in those days. I also learned and benefited much from a most able and helpful research assistant, Calvin Henson. My main project while at Walter Reed was a comparison of the spontaneous firing of single cortical cells in sleeping and waking cats. I began by recording from the visual cortex: it seemed most sensible to look at a primary sensory area, and the visual was easiest, there being less muscle betweeen that part of the brain and the ouside world. It was first necessary to devise a method for recording from freely moving cats and to develop a tungsten microelectrode tough enough to penetrate the dura. That took over a year, but in the end it was exciting to be able to record from a single cell in the cortex of a cat that was looking around and purring.

In 1958 I moved to the Wilmer Institute, Johns Hopkins Hospital, to the laboratory of Stephen Kuffler, and there I began collaboration with Torsten Wiesel. A year later Kuffler's entire laboratory (nine families) moved to Harvard Medical School in Boston, at first as part of the Department of Pharmacology under Otto Krayer, who was largely responsible for bringing Kuffler to Harvard. Five years later, in a move unprecedented for Harvard, we became the new Department of Neurobiology. My daily contacts with Stephen Kuffler (until his death a year ago) and with Edwin Furshpan, Edward Kravitz, David Potter and Simon LeVay have been both fun and enriching. During the past twenty two years, besides working with Torsten, I have collaborated briefly with Ursula Dräger, Helga Ginzler, and Ann Graybiel. At present I am working with Margaret Livingstone.

Since the age of five I have spent a disproportionate amount of time on music, for many years the piano, then recorders, and now the flute. I do woodworking and photography, own a small telescope for astronomy, and I ski and play tennis and squash. I enjoy learning languages, and have spent untold hours looking up words in French, Japanese and German dictionaries. In the laboratory I enjoy almost everything, including machining, photography, computers, surgery - even neurophysiology.

This is perhaps a suitable place to express my deep gratitude to the Eye Institute of the National Institutes of Health, to the U.S. Air Force, the Klingenstein Foundation, and to

the Rowland Foundation for their generous support of our research. Also the Faculty of Harvard University deserves my thanks for tolerating such a truculent colleague.

From *Les Prix Nobel*. *The Nobel Prizes 1981*, Editor Wilhelm Odelberg, [Nobel Foundation], Stockholm, 1982