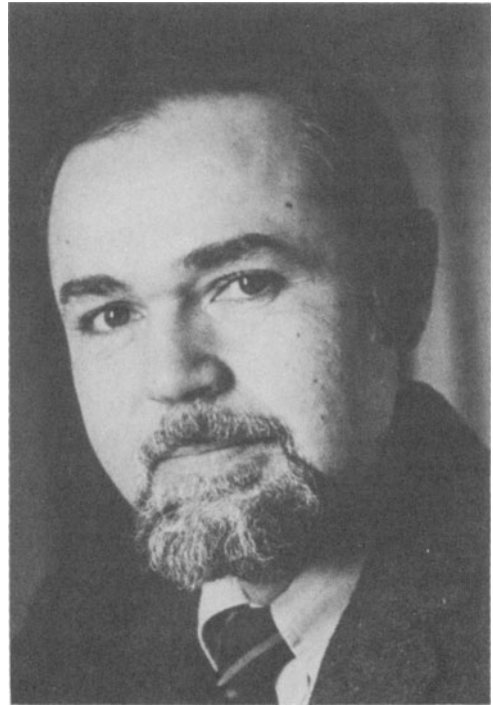
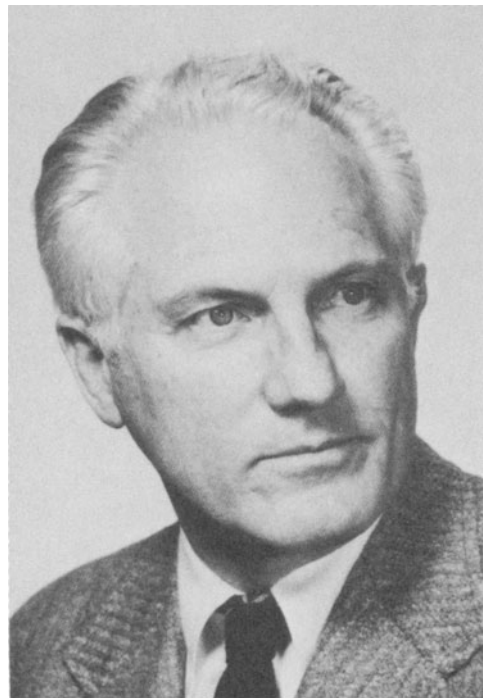


The Neurosciences: Paths of Discovery

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Half a Century in the Neurosciences: Personal Comments on Choices and Decisions

Ragnar A. Granit

If I were to meet the young man who emerged from the Swedish Normallyceum to matriculate at Helsingfors University in the spring of 1919, I am afraid I would find him a most disappointing companion. “Ripeness is all,” and so profound are the changes brought about over the years that one would feel abashed at having to hail that youngster as an alter ego. Also, as a character he would seem to possess all one’s faults without the insight and experience by which one cleverly tries to hide them.

The young man was interested in psychology—a widespread weakness in young people—and his gifted teacher, the philosopher Eino Kaila, introduced him to the experimental variety of that science. This was the time in Germany when Gestalt psychology rose to prominence, headed by a clique of talented enthusiasts. The best known were perhaps K. Wertheimer, W. Köhler, K. Koffka, and A. Gelb. The Gestalt school had started a spirited attack on what they held to be a disintegrative and meaningless splitting-up of mental events by most of the experimental approaches of the time. Their leading thesis was that the experienced world consists of formed (*gestaltete*) entities, not further reducible by experimentation, though accessible to experiments properly designed to demonstrate Gestalt qualities or rules.

An example is needed to show how this attitude could be experimentally realized. I shall take an experiment that Gelb and I carried out in 1922 when I worked with him for two months in Frankfurt in a laboratory whose formal head was Professor F. Schumann (Gelb and Granit, 1922). We had a set of Maltese crosses photographically produced so as to make a given nuance and brightness of gray appear either as the cross or as its background. The threshold of a small spot of light was found to be higher when projected on the cross than when projected on the background between two of its arms. Crosses and backgrounds were alternated on separate charts. The experiment was designed on the Gestalt principle to check whether an integrated Gestalt might not create a greater resistance to an added disturbance than a background experience of the same physical qualities. It seemed that it did.

The Gestalt approach, whatever its theoretical value, has to its credit a number of important studies, such as those of Goldstein and Gelb on cases of head wounds from World War I and Köhler’s behavioral experiments with chimpanzees. The latter became very well known and rendered him the nickname of “*Affenköhler*.” The impending threat of Nazism broke up the school. Some of its most influential members emigrated to the United States, and the young man of whom I have

spoken decided, on the advice of an uncle who was a practicing physician, that it would be necessary to study medicine seriously if he was to do something sensible in psychology. He therefore abandoned the field, and this is where I also quit him now. However, he may have left some trace in my upbringing because now, in my retirement, like a snake biting its tail I have begun to understand that psychological points of view could be used very profitably in the study of voluntary movement as a physiological process.

It is curious to reflect how young physiology is as a science. Those of us who were born at the turn of the century have had personal contact with pupils of the fathers of our science. While still interested in psychology, I listened—I believe in 1920—to lectures by Robert Tigerstedt in a course on the physiology of the special senses, and he was a pupil of Carl Ludwig. Tigerstedt was a true *Gelehrter*, a polyhistor such as our times do not produce. His textbook was read in many countries, but his reputation rests mainly on his large and authoritative monograph on circulation, containing everything published in that field up to the day of its appearance (Tigerstedt, 1921–1923). With Bergman, Tigerstedt discovered renin, a little too early for the physiology and biochemistry of his own time. As a young physiologist he moved from Helsingfors to the Caroline Institute in Stockholm, but in the end he left the chair at the institute and returned to Helsingfors University as professor of physiology. His son Carl succeeded him in this position.

When in 1926 I was made demonstrator (*Assistent*) at the Physiological Institute in Helsingfors, Robert Tigerstedt's creation, I still thought of physiology as something to be studied for the sake of a future career in experimental psychology, but the long-lasting medical course brought about a gradual change of attitude and interest. Clinical work was not without its temptations. However, I became more and more interested in the nervous system and the special senses, vision above all, for their own sake, and started to improve my knowledge in these disciplines.

At the time Helsingfors University, like other Scandinavian universities, was dominated by the German academic tradition, and most of the textbooks were in the German language. Alongside the course I read, first and foremost, Ewald Hering, then Helmholtz, Mach, König, von Kries, the special articles in the great German *Handbücher*, and some psychologists such as Ebbinghaus, Wundt, and G. E. Müller. I even read through Freud's *Vorlesungen über Psychoanalyse*, but apparently too late in the day relative to my own development, because I found them utterly unscientific, though highly entertaining as products of an original mind. Another quite original mind and great writer was William James, whose *Psychology* I studied at an early date with much admiration. Like Freud, James had had a medical education. But, though in published correspondence James made some very caustic remarks about the narrow-mindedness and bigotry of scientists, including experimental psychologists (naming Hugo Münsterberg), he himself stayed within the boundaries of scientific criticism when writing psychology.

I departed from the pattern of my own generation in feeling much attracted by the English language and civilization. For my first visit to a foreign country, in 1920 (thanks to the generosity of my father), I chose to go to a holiday course at London University in order to study English. This left me with a permanent feeling for Dr. Johnson's remark that the man who is tired of London is tired of life.