Seymour S. Kety 1915–2000

Seymour S. Kety, who made productive applications of the basic sciences to the study of human behavior in health and disease, died at his home in a suburb of Boston on 25 May 2000. More than any other single individual, Kety was responsible for the emergence of modern psychiatry as a rigorous and heuristic branch of medicine. He discovered a method for measuring blood flow in the brain, was the first scientific director of the National

Institute of Mental Health and produced the most-definitive evidence for the essential involvement of genetic factors in schizophrenia.

Born in Philadelphia, Kety received his MD from the University of Pennsylvania, but his interest in science burgeoned at the age of 10 when an aunt bought him a chemistry set. Chemistry became his hobby, and during college Kety obtained a job with a toxicologist who was a consultant to several lead companies. He had Kety analyze the urine of the workers at those companies. The standard procedure was to precipitate the lead as an insoluble salt, and then redissolve it with sodium citrate, which formed a chelate with the lead. On the basis of this experience he assumed that one could treat lead poisoning by administering sodium citrate to increase the excretion of lead, a hypothesis he later confirmed while a medical student, and then published in 1942.

He obtained a fellowship at Harvard with Joseph Aub, a world authority on lead poisoning, but World War II had broken out, and Aub had begun working on traumatic shock. Kety quickly became interested in shock, and recognized that the reflexes triggered in shock preserved the circulation of the blood in the brain and the heart at the expense of the circulation in other organs. His interest then turned to cerebral circulation and, after completing his fellowship with Aub, he returned to Penn to work on cerebral circulation in Carl Schmidt's laboratory. There he developed a very original technique for quantitative measurements of blood flow and energy metabolism in the human brain. The technique was based on his insight that the brain would absorb an inert diffusible gas from arterial blood, and its accumulation should be independent of the brain's metabolic activity and dependent only on physical parameters such as diffusion, solubility and perfusion. In a classic paper published in 1951, he presented his mathematical treatment of the exchange of diffusible substances between capillaries and tissue in the lung and other organs, and opened a new chapter in physiology and medicine. He examined these processes in essential hypertension, diabetic acidosis, schizophrenia, normal sleep and anesthesia, and elucidated many of the underlying physiological processes. By combining his equations with autoradiography, he could measure the circulation in different regions of the brain. When used with positron emission tomography, his principles made possible the measurement of local blood flow and the visualization of functional activity throughout the brain. The field

of functional brain imaging was thus ushered in, revolutionizing the study of mental, cognitive and emotional processes.

Because his studies were seen as changing the face of psychiatry, and despite his not being a psychiatrist, he was offered the scientific directorship of the newly established National Institute of Mental Health in 1950 and was given the opportunity to create a research program of unprecedented

magnitude and quality. He recruited the most-promising scientists with assurances of complete scientific freedom, believing that supporting good people and leaving them alone to direct their own program yields the best research. His selection of scientists was so shrewd and the atmosphere he created was so generative that more than twenty among those he appointed were ultimately elected to the National Academy of Sciences and two received Nobel Prizes.

Believing that psychosis must have a substantial biological substrate to warrant increased support of the biologic sciences, Kety turned to the study of genetics in psychiatric illness. He recognized that in the existing family and twin data, genetic and environmental influences were confounded, but the process of adoption could permit these factors to be disentangled. He therefore set about studying the biological and adoptive families of adoptees who had become schizophrenic. These studies were carried out over 25 years with American and Danish co-workers, and produced the most-definitive evidence so far for genetic liability as a chief factor in the etiology of schizophrenia.

In 1967 he accepted an appointment at Harvard University, where he became chief of the Laboratories of Psychiatric Research, first at Massachusetts General Hospital and then at McLean Hospital. There, as he had at the National Institute of Mental Health, he built a strong research program that emphasized basic research in many of the sciences pertinent to psychiatry.

His scientific contributions earned him election to the National Academy of Sciences, the American Philosophical Society, the American Academy of Arts and Sciences, 10 honorary degrees and many awards, including the 1999 Albert Lasker Special Achievement Award in Medical Science.

Seymour Kety was a warm, thoughtful, reflective and gentle man who loved good music, good food and good wine. Few could match his ability to tell a sidesplitting joke. He treasured family life, and was devoted to Josephine, his wife of 60 years, his two children, Roberta and Lawrence, and two grandchildren. They survive him, as do several generations of scientists who were his students, colleagues and grateful admirers. All are both richer for having been touched by his presence and poorer for having lost him.

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