Curt Richter

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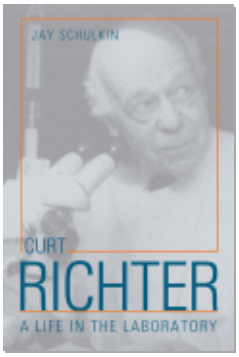

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Introduction

Curt Richter's is not a household name. He is little known to the general public and, though a psychologist, is probably not known to most psychologists. He was an investigator of behavior and physiology who made profound contributions to our understanding of the behavioral and physiological systems that serve adaptation and long-term viability. Curt Richter was the paradigm of the psychobiological investigator.

In the late 1990s, I spent some time with Timothy Moran at the Alan Mason Chesney Medical Archives at Johns Hopkins poring over some of Richter's laboratory books. We had to wear lead-protective suits that covered us from head to toe to keep us safe from the lead-infested notebooks. Richter's laboratory dated back more than sixty years and lead paint had peeled off the walls and fallen onto his charts. As we looked through the laboratory books, we found nothing that we thought he had not already published (log books on sodium, calcium, and metabolic ingestion), but we were both struck by the beauty of his books—the annotations in the margins, the precision and artistry of his notes. We focused on the nutritional experiments. Notes and drawings, amid carefully collected data, were integral parts of these laboratory artifacts. Despite the age of the books and charts, the care Richter took and the clarity of the records were obvious. Moran and I were filled with awe and appreciation. We were also struck by the economy of his style—he wasted very little.

Just who was Curt Richter? What was the context for his approach to research? He was biological in his understanding of behavior. He was fearless as a scientist-adventurer, and in expression he was always close to an engineer, replete with artisan's sensibilities.

In gaining a sense of Richter, two factors are important: (1) The medical school at Johns Hopkins was an ideal place for him. (2) He was a paradigmatic laboratory researcher.

A CULTURE DEVOTED TO RESEARCH, MEDICAL TREATMENT, AND TEACHING: THE JOHNS HOPKINS UNIVERSITY

After receiving his bachelor's degree from Harvard, Richter pursued a graduate degree in psychology at Johns Hopkins. There he entered a cultural atmosphere devoted to research and intellectual freedom (Gilman 1906), two themes on which Hopkins and its trustees prided themselves (Hawkins 1960).

In the 1870s, Hopkins attracted some of the best minds to Baltimore, including C. S. Peirce, founder and developer of American pragmatism, who was a logician and the son of Benjamin Peirce, the great Harvard mathematician and one of the founders of the National Academy of Sciences (Brendt 1993). "Freedom of research" was a much-used dictum by Daniel Coit Gilman (1906), the first president of Hopkins, and also by Richter (1953f).

Reflecting on his experience at Hopkins, founded in 1878, Richter recalled that Gilman "had inspired many very capable young men to join the academic and medical part of the university, and has inspired those men with high ideas of research and particularly of the freedom of research" (Richter 1985, p. 370). Freedom of inquiry was the cornerstone of Richter's own scientific sensibility (Richter 1953f).

Richter lived his intellectual life in the culture of a hospital, a medical world; it was also a culture of research and teaching. The university and hospital were fresh with youth and full of promise. Outstanding figures such as William Halsted, William Osler, and, later, Harvey Cushing were part of the intellectual medical ambiance (Crowe 1957; Harvey et al. 1989). Hopkins was a relatively new institution; the university had been established less than fifty years before Richter arrived. The Phipps Clinic, the new psychiatric unit at Hopkins, was half a decade old (Harvey et al. 1989).

The philosophy at the medical school was expressed by Claude Bernard, the great French experimental physiologist: "Our single aim is and has always been to help make the well-known principles of the experimental method pervade medical science" (Bernard 1865/1957, p. 3). Bernard, along with Walter Cannon, who was well known for his work on homeostatic regulation and physiological adaptation, had a profound influence on Richter, who would

extend their ideas by demonstrating the role of behavior in the regulation of the internal milieu.

Bernard expressed a philosophy of experimental medicine, and the experiment as it relates to theory would figure importantly in Richter's work (see introduction by Henderson in Bernard 1865/1957; Holmes 1974). Richter's two main influences, Bernard and Cannon, elegantly demonstrated the physiological analysis of basic regulatory events. One key issue for Bernard and, later, for Cannon (and certainly, as we will see, for Richter) was keeping the internal milieu stable and functioning (Wolfe, Barger, and Benison 2000).

A concept of the organism as adapting and coping with its environment, formulated by diverse thinkers and culminating in Darwin's great works, was part of the experimental framework of the laboratory cultures that were emerging. But while Bernard was arguing for the fixed nature of biological expression and his science was rooted in methodological considerations, others were trying to conceptualize a more broadly organismic sensibility in which to understand the role of physiological adaptation (e.g., Cannon 1932/1966; Cross and Albury 1987) and, eventually, behavioral adaptation (Richter 1943) in the regulation of the internal milieu.

This experimental ambiance contributed to and helped set the stage for a report by Abraham Flexner (1910/1978), now commonly referred to as the Flexner Report, which was commissioned by the Carnegie Foundation. Flexner asserted that "if, then, a laboratory is a place constructed for the express purpose of facilitating the collection of data bearing on definite problems and the initiation of practical measures looking to their solution, the hospital and the dispensary are laboratories in the strictest sense of the term" (Flexner 1910/1978, p. 92).

The Flexner Report examined the state of medical education at the time and made recommendations for the teaching of laboratory skills and other skills essential for physicians. Physicians needed to be familiar with the workings of the laboratory and exposed to the methods of the biological sciences. But Flexner also noted that the "laboratory method in medicine is considerably less than 100 years old" (Flexner 1910/1978, p. 62). The stated goal of the report was to enhance medical education and the training of physicians by linking the practice of research to medical training; physicians would be under the rubric of science, self-corrective inquiry, scholarly endeavors, and so on (Hudson 1972).[1] Hopkins provided an example of the research-oriented hospital for the

rest of the country, showing how a university and teaching hospital were to instruct physicians while caring for patients (Chesney 1943, 1963).[2]

The great bulk of individuals working in Richter's laboratories were medical students (see chapter 6). There they were exposed to the workings of science, and although many of them would not have a career in it, science—the testing of hypotheses, the self-corrective method, the actual doing of experiments—would be part of their sense of who they were. The laboratory sense of science was not foreign to them.

The United States was emerging as an important part of the culture of science; science was to be promoted (Numbers and Rosenberg 1996). There was an abiding faith in science and in scientific education in the United States (Rosenberg 1976/1997), and nowhere was this better represented than at the Johns Hopkins University. The hospital was to be a culture in which research would inform medical decision making. Of course, the experimental physiologists (e.g., Bernard) understood that the end point of their research was to better the human condition by applying what they learned to the practical affairs of human health and well-being.

Richter was fortunate to have fallen in with Adolf Meyer, who was to play a fundamental role in his career. Meyer's name appears often in this book. He was the chair of psychiatry at Hopkins for more than thirty years (until 1941); he embraced American pragmatism and wrote extensively about it, wrote some of the first works on psychobiology, and was erudite in and understood a vast array of sciences. He was also a physician who was devoted to patients and their well-being.

A LABORATORY STATE OF MIND

Richter was glued to his laboratory, and that relationship was a work of beauty—fearless, experimental beauty. He was methodologically driven and held a few core ideas, some of which, including total self-regulation of the internal milieu, he inherited from Darwin, Bernard, Charles Sherrington, Cannon, and Meyer.

His science should be understood against the background of the social environment in which he lived, the scientific paradigms he understood and participated in and expanded upon, and his experimental inventiveness. Science is known in part by the hypotheses it generates (Peirce 1898/1992; Hanson 1971), the paradigms and research orientations in which scientists labor (Kuhn 1962), the methodological innovations that support the everyday practice of

science, and the experiments, of course (Galison 1987). Science is a social process; scientists work within frameworks that guide their research, in schools of thought that underlie what they look for and see. Richter was no different from other scientists in this regard.

Richter is best known for his methodological innovations in the laboratory, the way he extended core ideas (e.g., the role of biological clocks in the organization of behavior, the role of behavior in the regulation of the internal milieu), his fearless sense of inquiry, his tenacity in staying with core issues over a lifetime, and his laboratory artistry. He presupposed, like all thinkers, ideas or working hypotheses that guided his investigations. He spent most of his life demonstrating phenomena rather than in the engagement of ideas.

The laboratory culture in which Richter operated assumed a set of psychobiological concepts that were small in number but rich in scope. The field of psychobiology was relatively new; William James (1887, 1890/1952), following Darwin (1859/1965, 1872/1998), pointed to the role of biology in behavioral adaptation, and Adolf Meyer wrote extensively on psychobiology (Meyer 1915). The relationship between psychology and medicine was already part of the discussion of leading scholars, including Robert Yerkes (1921), who was one of Richter's undergraduate teachers (see chapter 1). The concept of psychobiology would take on diverse meanings (see Dewsbury 1991); Richter would become a major proponent of, and would come to represent, psychobiological research.

Richter's laboratory sensibility was replete with wonder and play, and the longevity of his career (more than sixty years) perhaps was linked to this feature. Playfulness was also behind his sense that what mattered was "free research," research institutions and funding agencies that allowed valued individuals great latitude in what they could do, what they could explore (see Richter 1953f). His mode of research discovery was motivated less by experimental design worked out in advance than by open-ended exploration. Richter, like other successful scientists of his day (and our own), was supported by foundations devoted to advancing research in American universities (Kohler 1991).

Some core themes and influences are evident in Richter's contributions. Behavioral regulation and physiological regulation were core themes for Richter. Although exploratory, Richter's approach to research was systematic, inventive, and innovative, yet it had no statistical design. He was like many other investigators in that regard. Richter's approach to the behavioral sciences

was a search for innate organization. And although his work was situated in the laboratory, he identified himself as a zoologist (Roe interviews, American Philosophical Society Archives, 1952), or what I call a laboratory ethologist. What do I mean by that term? During Richter's time, the ethologist emphasized innate structure, while the psychologist tended to emphasize learning. There was little room in Richter's understanding of psychobiological events for theories of learning. Richter thought as an engineer (how do you make something?); as a psychobiologist, he was determining the hardware necessary for adaptation. He never strayed far from this perspective.