Pioneering Women

Untold Lives. The First Generation of American Women Psychologists. ELIZABETH SCARBOROUGH and LAUREL FURUMOTO. Columbia University Press, New York, 1987. xvi, 236 pp. $27.50.

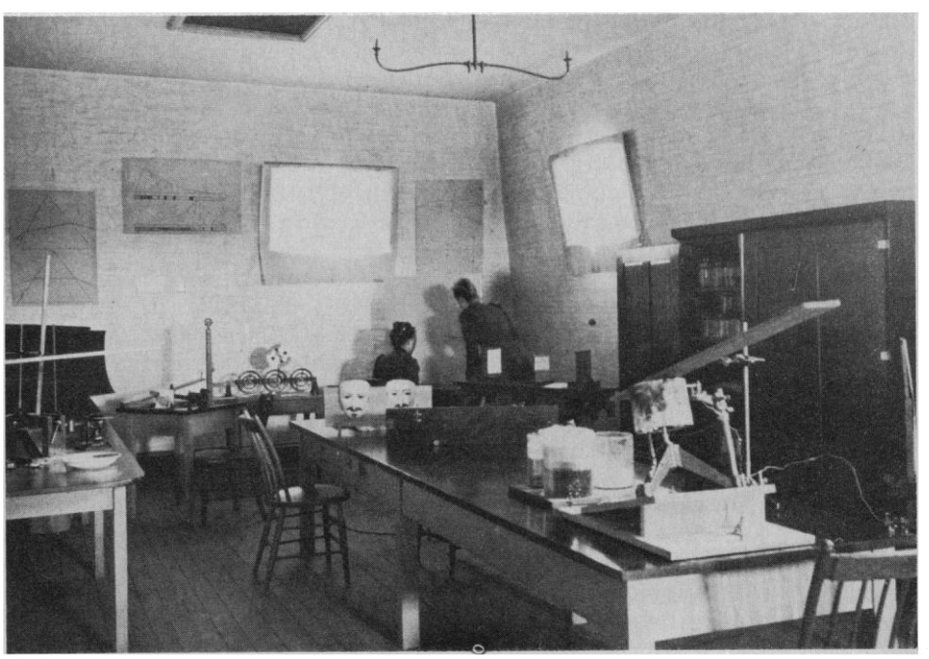
By 1906 scientific psychology in the United States was nearly 30 years old. Its founders were men who had received some or all of their graduate training in Germany, psychologists whose names and works are now well known both within and outside their field (William James, John Dewey, G. Stanley Hall, E. B. Titchener). Among their students in those exciting formative years of the new science were the women described in *Untold Lives: The First Generation of American Women Psychologists*. Defining this generation as women who had joined the American Psychological Association (APA) by 1906 or who were identified as psychologists in the 1906 edition of *American Men of Science*, Elizabeth Scarborough and Laurel Furumoto provide a collective portrait of the social origins, education, and careers of these 25 psychologists, a discussion of the lives and work of five of them, and cameo portraits of six others. As a contribution to the social history of scientific psychology the book is invaluable. The ten pages of references in themselves provide a discerningly selected introduction to this period in the history of psychology by psychologists familiar with the material from their own historical work (Furumoto on Mary Whiton Calkins, Scarborough on Margaret Floy Washburn).

The five psychologists described at length in part 1, in the most detailed biographies of them currently available, are Mary Whiton Calkins (inventor of the paired-associate technique for studying memory, proponent of her theory of self psychology, president of APA), Milicent Schinn (author of *Notes on the Development of the Child*, recognized today as a pioneer in developmental psychology), Ethel Puffer (author of a book on the psychology of aesthetics, social commentator, director of the Institute for the Coordination of Women's Interests at Smith College), Margaret Floy Washburn (author of *The Animal Mind*, the first systematic presentation of the new field of comparative psychology, president of APA, member of the National Academy of Sciences), and Christine Ladd-Franklin (prolific vision researcher, proponent of her theory of color vision). Psychologists for whom cameo portraits are provided in part 2 include Kate Gordon Moore (first chair of the graduate psychology department at UCLA), Lillien Jane Martin (first woman to chair a department at Stanford, 1913 recipient of an honorary Ph.D. from the University of Bonn), Naomi Norsworthy (author of *The Psychology of Childhood*, a text widely used in teacher training colleges), and Helen Bradford Thompson Woolley (pioneer in research on sex differences, organizer of one of the first laboratory schools for the study of child development).

Throughout the book, the emphasis is on this group as the first generation of *women* psychologists, individuals who struggled against great odds to be scientists at a time when women's right to a college education, much less to graduate training, had only just been recognized. They were denied the access men of their class and race had to training, employment, and professional association; they confronted socially structured choices between work and family so stark as to make present-day contradictions between these roles seem benign (which they are not); and—this is one of Scarborough and Furumoto's main reasons for writing—though despite the odds they did first-rate science by the standards of their time, their contributions have not been appropriately acknowledged in historical accounts of their fields.

Scarborough and Furumoto see their work as part of the effort in women's history to move beyond compensating for previous neglect of women to a creative reexamination of the past "through the eyes of women and ordered by values they define." In choosing to examine the work and lives of educated professional women, however, the authors focus, as did the women they portray, on how being female affected access to the scientific training, employment opportunities, and family support that were available to educated white men. What is regrettably missing from the book—doubly so since the authors recognize its importance—is an analysis from a viewpoint that does not see access to the careers men had as the only or most valued possibility.

For example, a number of the women discussed by Scarborough and Furumoto perforce turned to what are now considered applied fields of psychology when they were excluded from teaching and research positions at major universities (upon their marriage or because of institutional policy or a taken-for-granted "best man for the job" mentality). The authors discuss in some detail how the "applied" fields and related nonacademic activities came to be devalued



Wellesley College psychology laboratory, 1890s. The first such laboratory in the United States in a women's college, it was established by Mary Calkins in 1891. [From *Untold Lives*; courtesy of the Wellesley College Archives]

Christine Ladd (later, Ladd-Franklin) while a student at Vassar, 1860s. Ladd-Franklin vigorously protested the exclusion of women from the Experimentalists, a small but influential group founded by E. B. Titchener in 1904. [From *Untold Lives*; courtesy of the Rare Book and Manuscript Library, Columbia University]

and marginalized as psychologists in research universities worked to secure their positions as scientists within the academic community. They do not treat in a positive way the meaning of the things these women did as psychologists or the consequences for scientific psychology of a self-definition (the selves being mostly male) that excluded and devalued such activities. Within the context of academic research, the exclusion of Margaret Floy Washburn and Christine Ladd-Franklin from the Experimentalists—an all-male organization founded by Titchener in apparently alarmed response to the proliferation of topics and approaches represented by psychologists in the APA—cut off these prolific and widely respected researchers from a source of informal association that greatly facilitated the work and careers of men psychologists. The Experimentalists also represented a socially powerful embodiment of Titchener's stipulative definition of psychology as the experimental study of the generalized, adult, normal, human mind. This impulse to set limits on the range of topics and methods that are genuinely psychological in the name of science and of the generalized human subject and the association of this impulse with the view that science is an exclusively masculine preserve have had a profound impact on the content and potential applications of scientific psychology. Although Scarborough and Furumoto do not explicitly formulate or follow up on some of the broader questions raised by their book, it is a measure of the significance of *Untold Lives* that their superb scholarship not only enables the reader to appreciate the accomplishments of some remarkable women but also offers a tantalizing glimpse into some issues of central importance in understanding the current status of scientific psychology.

MARY B. PARLEE
Ph.D. Program in Psychology: Developmental Psychology
Graduate School and University Center, City University of New York, New York, NY 10036

Nerve-Muscle Synapses

The Vertebrate Neuromuscular Junction. MIRIAM M. SALPETER, Ed. Liss, New York, 1987. xiv, 439 pp., illus. $96. Neurology and Neurobiology, vol. 23.

By virtue of its size, simplicity, and experimental accessibility, the neuromuscular junction is by far the best-characterized chemical synapse in neurobiology. Over the past three decades, thousands of papers have appeared describing the development, morphology, function, pharmacology, and molecular biology of the neuromuscular junction, as well as its response to injury and disease. This wealth of information may suggest that only a few details remain to be worked out and it is time to move on to other problems. Many workers have done just that and are exploring the more complex connections between neurons. However, as *The Vertebrate Neuromuscular Junction* demonstrates, this simple synapse is still rich in scientific potential.

Much current work on the neuromuscular junction is focused on the development, maintenance, and molecular organization of synapses. Even for molecules that otherwise are well characterized, these areas of research are still in their infancy. For example, consider the acetylcholine receptor. The entire primary sequence of the receptor has been determined from complementary DNA clones, and the behavior of its ion channel has been described with unparalleled precision in patch-clamp studies. Nonetheless, much about the receptor remains a mystery. How do embryonic nerve terminals tell a muscle fiber to cluster receptors at the forming endplate? Why do embryonic and adult endplates express different kinds of acetylcholine receptors? In mature muscle fibers, are genes encoding the receptor expressed only by nuclei near the endplate? With what other molecules is the receptor associated? These are just a few of the outstanding problems surrounding the acetylcholine receptor, and parallel questions can be raised about other components of the endplate.

This volume summarizes our understanding of the motor endplate and presents some of the problems of current interest. Written by the editor and seven co-authors, it begins with an overview of the structure and function of the endplate. Eight chapters on specific subtopics follow. Not surprisingly, the acetylcholine receptor receives special emphasis, with separate chapters devoted to its molecular biology, response to transmitter, and development. Other chapters focus on the presynaptic apparatus and on other molecules associated with endplates, such as acetylcholinesterase. Many topics are considered from a developmental perspective.

As is inevitable with a multi-author volume, the tone and quality of the chapters vary. In general the presentations are scholarly and up-to-date (as of early 1986) and contain good reference lists, but some are more balanced and lucid than others. Two stand out in particular. The review of motoneuron cell death and synapse elimination is exceptionally clear and informative. In part because of several good explanatory figures, this chapter should be readily accessible to readers new to the area. The concluding chapter on endplate diseases is also very good. Although necessarily somewhat clinical, it complements the preceding chapters by illustrating the consequences of specific deficiencies. What happens if acetylcholinesterase is missing? What happens if acetylcholine receptors fail to undergo their normal sequence of developmental changes? The precision with which these diseases have been analyzed is impressive.

Another high point is found in the introductory chapter on endplate function. In a series of five panels, a single color-coded figure schematizes the sequence of events initiated by the release of a vesicle of acetylcholine from a nerve terminal. It cleverly illustrates the interplay among acetylcholine, acetylcholine receptors and their ion channels, and acetylcholinesterase during the generation of a synaptic current. Better than any other, this figure shows what happens in the synaptic cleft during neuromuscular transmission. It merits careful study.

Now for the quibbles. Some topics receive scant coverage. For example, the sections on denervation, sprouting, reinnervation, and muscle regeneration are compressed into just a few pages. Discussion of the role of the basal lamina in synapse formation and maintenance is similarly condensed. A second complaint concerns the figures. Although many illustrations are first-rate, others are overly complex or marginally informative. Moreover, the quality of reproduction of some micrographs is disappointing. Third, some sections (fortunately, a minority) are poorly focused or simply obscure. Finally, the index is not very useful,