think on a grander scale about new buildings for science. The best of these—the Grace Auditorium—works marvelously well, and its beauty shines through in the handsome images in this book. By contrast, the latest building—the Beckman Laboratory—is perhaps not as good as Elizabeth Watson's book makes it appear. Monumental in both style and size, it looms on the ridge like a large headache, and its mass overwhelms the more modest buildings that have served the laboratory so well.

From time to time, a few of us who remember the old Cold Spring Harbor get together and bleat about its newfound aspect as a DNA theme park complete with coffee mugs, T-shirts, and tourists. Casual visitors who buy this exquisitely produced book will find it informative, accomplished, and engaging. But it cannot move them as it moves us, who still dream of Cold Spring Harbor as it was. *Houses for Science* is, after all, a chronicle of our youth.

Joseph F. Sambrook
Department of Biochemistry,
University of Texas,
Southwestern Medical School,
Dallas, TX 75235

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Hopeful Meetings

The Cybernetics Group. STEVE JOSHUA HEIMS. MIT Press, Cambridge, MA, 1991. xiv, 334 pp. $25.

To a diverse group of mathematicians and behavioral scientists the time seemed ripe after World War II for a collaboration that would blend the mathematics of cybernetics and game theory with the new look in anthropology, biology, psychology, political science, sociology, and psychiatry. The 30-odd participants included Norbert Wiener and Julian Bigelow from the mathematics and computer side and, representing a concern with the development of the behavioral sciences, Gregory Bateson, Lawrence Frank, Lawrence Kubie, Rafael Lorente de Nó, Margaret Mead, and Arturo Rosenblueth. The challenge to the group was put forth most eloquently by Warren McCulloch, a neurophysiologist who played a central role and who on occasion would quote, "Tell me where is fancy bred, Or in the heart, or in the head?"

The form of the collaboration was a series of meetings called the Macy Conferences on Cybernetics that took place between 1946 and 1953. The story told in this account of the enterprise is a curious mixture of real politics, academic politics, egos, and great optimism in a period of political and scientific transition. In this context, a group of professionals who had little solid intellectual investment in common came together in a manner that permitted them to suspend at least some of their prejudices and engage in mutual monologues and possibly dialogues.

This reviewer, as a graduate student and postdoc, knew many of the *dramatis personae* covered in this book. Their enthusiasms, prejudices, and prognostications helped to make me understand the distinction between science and the sociology of science. This is a book about the sociology of science. It is written like a whodunit. The approach is historical. The context is set for U.S. physical and social science in the Cold War period. The liberal or conservative backgrounds of the major participants are sketched; the growth of McCarthyism and its influence on the academic community are noted. The narrative begins with a coming together of optimists as early as 1942, when Frank, Mead, and Bateson met with McCulloch and Rosenblueth to sketch out new ideas promoting the interaction of the so-called hard sciences with the social sciences. The concept of feedback as a means of modeling and studying human behavior caught the imagination of all. What analogies were in the minds of Wiener, Rosenblueth, and Bigelow may, however, have been far from those in the minds of Mead, Bateson, or the psychiatrist Kubie.

Possibly the most charismatic and dedicated seeker of the grail of understanding the mind and brain was McCulloch, whose dedication to the concrete understanding of mechanisms could and did drive most psychiatrists to distraction. The model of the mind put forth by McCulloch and Walter Pitts was congenial with the ideas of Wiener and John von Neumann and can be regarded as a precursor of the field of artificial intelligence.

In the social dynamics of the meetings it is of interest to note that the psychoanalyst Erik Erikson was essentially vetoed as a member by the more mathematical cybernetics wing, while the physicist and biologist Max Delbrück was invited to join but after attending the fifth meeting commented that it was "vacuous in the extreme" and declined to attend further.

The book provides thumbnail sketches of many eminent social scientists of the time, among them Leonard Savage, Paul Lazarsfeld, Kurt Lewin, and Gregory Bateson. As the plot unfolds one sees the battle between Kubie and McCulloch, in which the former expressed concern that Warren "needed help."

Where does the tale come out? Although one should not give away the plot, reviewers of complex mysteries with large casts are trapped into at least giving hints.

In academia it is still possible to use the conference series as a quasi-institution that self-destructs sooner or later. The Macy conferences enabled a large number of distinguished professionals to interact with, stimulate, infuriate, or fascinate each other. Other potential participants, such as Delbrück or von Neumann, attended infrequently or refused to join. Those with a deep mission such as McCulloch forged ahead, conferences or no.

The practice of holding pleasant half-baked conferences aimed at interdisciplinary collaboration is highly desirable. But the product cannot be measured easily in terms of joint papers or "breakthroughs." The interaction helps to change mind-sets, but in general the process is not immediate. When we view the sweep of the physical sciences, biology, the social sciences, mathematics, and computer science in the last 40 years, it is clear that the changes have been enormous. "Cybernetics" was an "in" word in the '50s; "chaos" is in now; strange attractors have trendy proponents and conservative detractors, but nevertheless knowledge has accumulated. The vision of being able to produce viable models of the mind and brain is still there; but the problems in understanding both human and artificial intelligence grow as we understand more.

The story told by this book is fascinating. The last line is, "The conversation continues." It also changes and expands.

Martin Shubik
Cowles Foundation for Research
in Economics,
Yale University,
New Haven, CT 06520–2125

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Neural Oscillations

Suprachiasmatic Nucleus. The Mind's Clock. DAVID C. KLEIN, ROBERT Y. MOORE, and STEVEN M. REPPERT, Eds. Oxford University Press, New York, 1991. xvi, 467 pp., illus. $85.

Like the answer to the question "How many circadian biologists does it take to screw in a light bulb?" (see below*), this book is best appreciated by those with some background in chronobiology. The focus is on the mammalian suprachiasmatic nuclei (SCN), two tiny groups of neurons located deep in the

*Answer: Two, as long as they are relatively coordinated (a reference to the term "relative coordination," used to describe the situation of an oscillator periodically influenced by, but not fully synchronized to, an entraining cycle).