illness, through deeply embedded in our consciousness, less and less reflects the real world of medicine. Chronic rather than acute diseases are the dominating medical problems. Increasingly, we are calling upon complex medical technologies to manage and treat these kinds of illnesses. And we rely on diversified and specialized medical teams to direct these technologies and coordinate their efforts toward therapeutic ends. This has resulted in a transformation in the social organization of medical work, at least as it is performed in hospitals.

A striking feature of large hospitals today is the tremendous amount of equipment they contain. There are machines that are used for diagnosis, for therapy, and for monitoring. Hospital administrators and staff pride themselves in having the most, newest, and best equipment. The widespread utilization of this machinery has profoundly altered the way medical work is structured, not only for doctors but for nurses, technicians, patients, and kin as well.

Anselm Strauss, Shizuko Fagerhaugh, Barbara Suczek, and Carolyn Weiner present us with a rigorous and detailed analysis of how work is accomplished in highly technologized hospitals. On the basis of several years of field observation and interviews by a team of observers in a variety of hospitals, the authors clearly illuminate the complexities of chronic disease and medical care organization. By using *the work itself* as a focus of analysis, they insightfully show how complicated, varied, and often unrecognized the actual "work" is.

In presenting their analysis—and this book is truly an analytic piece, going well beyond "mere" description—the authors use "illness trajectory" as the central concept. This is a refinement and clarification of an earlier conceptual development by Strauss. Eschewing notions like "course of illness," which they suggest are too narrow to comprehend what happens with chronic illness, they see a trajectory as referring "not only to the physical unfolding of a patient's disease but the total *organization* of work done over that course [of illness], plus the impact on those involved with the work and its organization" (p. 8). Trajectories can be seen "in terms of *clustered sequences of tasks* that constitute the details of trajectory work" (p. 30).

The bulk of the book is given to detailing the myriad of types of work that go into managing and shaping illness trajectories. There are chapters on clinical safety work (a central feature of medical care), comfort work (reducing patient discomfort caused by disease and medical interventions), sentimental work (interactional, emotional, and supportive work), articulation work (coordinating, revising, and implementing other work), and patient work (much of it invisible and unrecognized). The sociological lens Strauss and his associates use to examine and disaggragate hospital work, especially that surrounding medical technology, allows us to see the amount and complexity of activities that constitute medical care and forces us to begin to see "work" where we did not recognize it before. I was particularly taken by the authors' descriptions of patient and kin work, a central but seldom noticed or acknowledged part of medical care.

The book includes intermittently a number of long but interesting illustrations of specific examples of the work involved in shaping and keeping trajectories under control (a key medical goal) and a specific examination of how actions in the intensive care unit and intensive care nursery affect the hospital structure and vice versa.

This book is excellent in examining the tissue of medical work in technologized hospitals. However, the authors tell us much about the what's and how's but little about the why's. There is a stylistic penchant here for cataloguing types of work (four types of monitoring, eight kinds of comfort tasks, seven types of sentimental work, and so on) and presenting us with long lists (of properties of medical machines, or monitoring, or safety limits). Such an analysis often paints a static rather than a dynamic picture of medical work. Strauss *et al.* tell us a great deal about the impact of technology on medical work but do not analyze the professional fascination with medical technology or explain the sources of the expanding "technological imperative" in medicine. Since the authors promise us three more books from the project, one hopes they will broach these issues elsewhere.

In sum, this book presents a unique contribution to the sociology of work and to our understanding of the human effects of technology in hospitals. In light of the apparently unceasing growth of medical technology, the types of work examined here are bound to become more evident and central to medical care. This well-grounded and precise study will likely remain significant for years to come.

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Oscillating Chemical Reactions

Oscillations and Traveling Waves in Chemical Systems. RICHARD J. FIELD and MÁRIA BURGER, Eds. Wiley-Interscience, New York, 1985. xxii, 681 pp., illus. $85.

Chemical curiosities—this was the label often attached to oscillating chemical reactions. Nowadays, however, such reactions are the subject of active research by scientists in widely different disciplines. It is recognized that chemically reacting systems provide some of the best-characterized examples of nonlinear dissipative systems. Such systems, in the far-from-equilibrium regime, not only display complicated periodic motions but sometimes behave chaotically as well. Complicated temporal behavior is not the only possibility; spatial structures can form as a result of the interplay between chemical reactions and diffusion.

The phenomena exhibited by these chemical systems are worthy of study in their own right; they provide physical examples of dynamical behavior whose mathematical basis is often unknown. They also serve as paradigms for more complex biological systems, which are often poorly characterized.

This book contains an account of oscillatory behavior and spatial pattern formation in chemically reacting systems. It begins with a description of some of the principal results in bifurcation theory; this is surely appropriate since bifurcation theory permeates the analysis of most of the experimental studies presented later in the volume. Roughly speaking, the remainder of the material in the book may be divided according to whether the focus is on the chemistry of the process under consideration or on the general character of the bifurcation structure exhibited by these systems. In those parts of the book devoted to chemistry, an attempt is made to understand the origin of the oscillatory behavior from an analysis of the mechanism of the chemical reaction. There are chapters devoted to the Belousov-Zhabotinskii reaction, everyone's favorite, as well as to a number of other liquid-phase and gas-phase reactions. "Well-stirred" chemical reactions can be modeled by sets of ordinary differential equations and thus are amenable to study by the use of the techniques of dynamical systems theory. The focus is not on the chemistry leading to a particular model but rather on the variety of possible behaviors given a particular class of models. Some chapters have this focus, but those that do are

somewhat less thorough than the chapters that focus on chemistry.

The description of spatial structure and pattern formation in chemical systems is quite nice. The study of this subject is much more complicated than the study of the temporal structure alone, since mathematical modeling entails the study of nonlinear partial differential equations, analysis of which is much more difficult. However, a great deal of progress has been made in understanding how waves propagate in chemical systems and what forms they can take. The study of the underlying chemical mechanisms is used to construct a class of models that are analyzed to yield both qualitative and quantitative aspects of these spatially inhomogeneous states. Since the Belousov-Zhabotinskii reaction takes place in an excitable medium, the descriptions of wave propagation in this system can be applied to other excitable media like nerve or cardiac muscle tissue.

The final chapter has a completely different character. It contains a treatment of chemical oscillations from historical and statistical perspectives.

The book presents a nice distillation of the advances in this field in the last decade or two. The (intentional) limitation of the book to oscillatory behavior excludes much recent work on chaotic dynamics, but the inclusion of this work would probably have required another volume. Though the book contains chapters by many authors, the subject matter is treated in a coherent fashion. There is clear evidence of serious editing in the selection and ordering of material as well as in the cross referencing between papers. The book should prove valuable to anyone wishing to pursue research on chemical oscillations.

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