ments is reviewed, compactly and necessarily superficially, by Robert Vrijenhoek for animals and by Kevin Rice and Subodh Jain for plants.

In brief, this is a patchy collection of individually very good papers, with an entry into a huge and fascinating empirical literature and a scattering of excellent small insights into a field that is still searching for its conceptual organizing principles. It will be of most use to specialists and advanced students. Unfortunately there are still vestiges of an artificial dichotomy between equilibrial and dynamic schools of ecology. The very title of this book predisposes it toward the dynamic school. The importance of the spatial and temporal scale of patch dynamics is made explicit, but equilibrial processes may be important at other scales. Perhaps readers of this book will absorb both its explicit and its implicit lessons and take a role in developing a still broader conceptual view of patchy environments.

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A Success of Medical Science

Penicillin. Meeting the Challenge. GLADYS L. HOBBY. Yale University Press, New Haven, Conn., 1985. xxii, 319 pp., illus. $32.50.

The history of penicillin is one of the most dramatic tales of the success of modern medical science. Much written about, it has been used as a demonstration of everything from the serendipitous nature of laboratory investigation (as witness Fleming's initial discovery of the moldy petri dish in 1928) to the benefits of wartime intensive project organization. Many participants in the events have published their accounts and numerous biographies have been produced. Most of these works have championed one or another interpretation, giving more or less credit to Alexander Fleming, or to Howard Florey, or to one or another of the institutions or corporations involved. Some historians have tried to make sense of parts of the picture, but few have fought through the extensive literature and interviewed on all sides of the still raging disputes. Hobby's general history has elements of all the earlier approaches but extends beyond a narrow focus or too partisan an approach. Herself a central participant in two major early experimental phases of the development, at Columbia University and at the Pfizer Corporation's successful large-scale production laboratory, Hobby has achieved a remarkably broad perspective.

Its collaborative nature may be the aspect of the story that is most difficult to appreciate. The agility with which scientists leapt to collaborate, complaining when hampered from sharing their research, might almost call in question the individualistic character of research. The excitement of transatlantic flights limited to VIP's and blacked out to hide from view the D-Day troops massing near the southern coast of England, the calculations with millions of dollars as large corporations together assessed the risks of involvement, the miraculous victories over bacterial endocarditis—these are the stuff of high drama. But collaboration had its seamy side, too. Questions about the appropriateness of sharing everything among the British and American scientists still plague those who will see pencillin as a British discovery unfairly commercialized in the United States. Disputes among the pioneers and their champions emerged repeatedly, most noticeably when knighthoods, Nobel prizes, and other awards were meted out. The chagrin of British manufacturers at having to pay royalties to American companies for mass production techniques long soured memories.

In no other single source are all these elements explained more fully, though considering the broadminded coverage of events a more dispassionate analysis might have been expected. In contrast to some British versions, this is an American perspective: "It was American ingenuity, U.S. dollars, and U.S. production acumen that led to penicillin's availability as an effective chemotherapeutic drug" (p. 281, note 1). Gratuitous as that may seem, Hobby supports the point well, and not without sympathy for British participants, despite her claim that there was a "strong conviction on the part of British investigators in the 1920s and 1930s that chemotherapy of bacterial infections was absurd and should not be contemplated" (p. 125). Similarly, Hobby believes that, simply because there was a clear need for effective antibiotics, penicillin would certainly have emerged some time around the years it did. This is a peculiar view to hold, especially given that the main point of this history is that special circumstances combined to create an international collaborative effort.

Even so, this is a valuable contribution to a most interesting story. Hobby has assured its utility by the numerous tables and graphs, the clear exposition of necessary technicalities, and the appendixes of economic and corporate data. This will not be the final word on the history of penicillin, but it presents more information more clearly than any predecessor.

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