of the themes behind the conceptual advances in the field. For example, one chapter details the roots of bacterial genetics in classical genetics and the following chapter its roots in bacteriology. Rather than presenting a personalized view of key players in the story, this book focuses on the science itself. It divides the development of the field into topics (mutation, mating, phage, lysogeny, transduction, transformation, gene expression and regulation, from bacterial genetics to recombinant DNA) and then traces the history of each, going back to the 19th century.

Perhaps the best way to understand the scope of *The Emergence of Bacterial Genetics* is to look at how a typical section is organized. In the chapter "Phage," Brock begins with the early history of phage research, discussing the discovery, by Frederick Twort in England in 1915 and Felix d'Herelle in France beginning in 1917, of a virus that attacked bacteria and the skepticism of the Belgian immunologists Gratia and Bordet regarding d'Herelle's interpretation. The studies of Burnet and of Northrop in the 1930s are reviewed as a prelude to a detailed account of Max Delbrück's entry into the field and the profound influence he had on modern phage research. Delbrück is one of the most important figures in early phage and bacterial genetics research, and it is fitting that a significant part of this chapter is devoted to his biography, the influences on his thinking that led him from physics into biology, and the effect he had on students and postdoctoral researchers who became pioneers in their own right. The chronological account of how each scientific paper and advance fitted into the development of the phage field represents the strength of this book. Delbrück's collaboration with Luria and their involvement with Cold Spring Harbor Laboratory, the work of Hershey, and the first steps in phage genetics are covered, and some of the key experiments are analyzed in detail, with tables reprinted from the original research papers. The Hershey-Chase experiment is given a particularly detailed treatment. Benzer's classic work on genetic fine structure is also nicely summarized. A consideration of the biochemistry of phage replication, including the prejudice of the phage group against biochemistry, and a treatment of the restriction–modification phenomenon close out the chapter.

One of the pleasures of reading the book lies in the treasure house of experiments that are not widely appreciated today. For instance, even though I myself have worked with the *lac* system of *Escherichia coli* for almost 25 years, I had not previously realized that in 1951 Joshua Lederberg had actually isolated the first constitutive (I^-) mutants, in which the *lac* enzymes were synthesized without the aid of an inducer. Lederberg had isolated mutants that could grow on the sugar neolactose, since it was thought that the specificity of β-galactosidase was such that neolactose was not cleaved by this enzyme. In reality, neolactose (somewhat in analogy to the sugar more widely used today, phenyl β, D-galactoside) is a good substrate for β-galactosidase, but it is not recognized as an inducer by the *lac* repressor. Therefore, mutants that could utilize lactose turned out to have high constitutive levels of β-galactosidase. The account of Lederberg's experiments is also interesting because of Brock's argument that they might be considered forerunners of the work by Jacob and Monod.

It should be stressed that the value of this book does depend somewhat on the audience. As a thorough and exhaustively referenced history of bacterial genetics through the beginning of the 1960s it is indispensable for the serious student of the history of this field. It is less accessible to the casual reader, however, because of its very completeness. As a work for students, it appears to be at the graduate level. In my opinion, it would require several modifications, most notably the inclusion of additional explanatory figures, to be considered as a supplementary text for an undergraduate course.

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Reprints of Books Previously Reviewed

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