Mouse Genetics

The Coat Colors of Mice. A Model for Mammalian Gene Action and Interaction. WILLYS K. SILVERS. Springer-Verlag, New York, 1979. xiv, 382 pp., illus. $29.80.

This book deals with one important branch of mouse genetics. Twenty-eight years ago, Hans Grüneberg was able to cover the whole subject in *The Genetics of the Mouse*. That was the last comprehensive work in the field. Since then, our knowledge of mouse genetics has just about doubled in each decade, so that seven or eight fairly weighty tomes would now be needed to do the same job. Thus this volume can be regarded as one of a series of monographs on different aspects of mouse genetics (another being Jan Klein's on the H-2 complex), which are urgently needed but only just beginning to appear.

Silvers describes no fewer than 62 loci that affect coat color in mice, with up to 17 known mutant alleles per locus. He successfully copes with this large body of mouse knowledge by dealing first with the best-known allelic series and then grouping in separate chapters genes with rather similar phenotypic effects, such as those for white-spotting. In addition, there are useful chapters on the pigment patterns of allophenic mice and on X-linked determinants, but there is little information on linkage relationships.

The organization of the book is somewhat unusual, since each chapter is divided into a main section that carefully describes the properties of each locus being treated, as well as actions and interactions of its mutant alleles, and subsidiary "notes" that give more detailed or more recondite information. Many fascinating items are included in these notes, from the relationships between beige and the Chediak-Higashi syndrome to the nature of the mammalian "spot test" for somatic mutations. This novel arrangement works well, ensuring a smooth passage for the reader who wants to know the essential features of a particular locus but also catering to the specialist who is interested in obtaining all the facts. The book contains many illustrations, including a a series of 24 mutants in color. These are mainly of high quality but have to be hunted for, since they are listed nowhere. There are over 800 references.

The author emphasizes that the book is not a "mouse watcher's color-guide" but is meant to show how all sorts of genetic phenomena, from modifying genes to epistasis, contribute to make mice the colors they are. However, people will buy it not for that reason but because it reveals present knowledge of one substantial slice of mouse genetics. If they want a tutorial on coat color genetics they will be disappointed, since the introduction is very brief and deals with little apart from the coat. If they want syntheses of various aspects of mouse color genetics, they will also be disappointed, and so was I. For instance, the author emphasizes that he has deliberately included accounts of the pleiotropic effects of color genes on the blood, skeleton, and other parts of the animal "in the hope that they may provide important clues for future investigations." Yet no synthesis of this valuable information is attempted, nor is the subject index of much help, since many of the references to pleiotropic effects are not indexed under that heading. This won't deter the mouse geneticist, who knows where else to look, but it may discourage someone from outside who is interested, for instance, in mouse models of human disease. In its field, therefore, the book will be very useful indeed, but the field seems to have been restricted more than it need have been.

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