
BOOK REVIEWS

INDICATIONS FOR AND RESULTS OF SPLENECTOMY, *Frederic Collier, Alexander Blain, III, and Gould Andrews*, Springfield, Charles C Thomas, 1950, pp. 100.

This little monograph deals with an experience with splenectomy among 132 patients with blood dyscrasias over a fifteen year period at the University of Michigan Hospital. It includes a good discussion of the functions of the spleen and of the theoretical concepts of splenic hyperfunction. Each of the common diseases for which splenectomy is performed is then discussed, giving indications, mortality rates and end results. It is somewhat difficult to determine quickly the end results from the text since there is no tabulation of the entire picture of the study and facts must be laboriously dug out of the text. Furthermore, several conditions such as congestive splenomegaly, Felty's syndrome, Gaucher's disease, and other conditions which sometimes manifest hypersplenism are taken up as separate entities when as a matter of fact, they might better be grouped under a general discussion of secondary hypersplenism. It is peculiar that no cases of "primary" hypersplenism either of the pancytopenic or neutropenic type were encountered in the authors' series.

The discussion on portal hypertension associated with the congestive splenomegalies is not adequately covered in view of the fairly substantial literature on the subject and the increasing evidence which allows a more optimistic view of the use of portacaval shunts than the authors take. Five years have already passed since Blakemore did his first shunts and the mortality of the combined splenectomy and splenorenal shunt for congestive splenomegaly is so low and the results sufficiently good to recommend this operation whenever splenectomy is considered in these cases.

The incidence of accessory spleens as found in the authors' cases (23 out of 132 or approximately 16 per cent) seems unusually low and there was an especially low incidence in the patients with congenital spherocytic anemia. The incidence of accessory spleens, their location and variability in certain disease states deserves more discussion especially for the surgical reader. The same lack of definitive discussion on the technic of splenectomy makes the monograph of less general value.

The material presented seems far from adequate for a monograph on this important and rapidly expanding subject. There is room for a much more extensive discussion of the problem.—*C. Stuart Welch.*

BLOOD GROUPS IN MAN, *R. R. Race and R. Sanger*, Springfield, Charles C Thomas, 1951, pp. 290.

Following the discovery of the rhesus factor by Landsteiner and Wiener, a new phase in blood grouping was opened, and during the past decade there have been tremendous advances in this field. More than five independent systems of blood types have been added to the three which were known before 1940, and there was need for a book summarizing these recent developments. The authors of this book have been in the forefront of contributors to the recent developments in blood grouping, and were therefore especially well qualified for such a task. As was to be expected, they have produced an authoritative, instructive and interesting book which will be welcomed by all requiring information concerning the subject. The interests of the authors have been in the serology and genetics of the blood groups, and it is with this aspect of the subject that the book deals primarily. The discussions of the clinical and anthropologic applications are therefore restricted, and for more detailed information concerning these subjects the readers are referred to forthcoming books by P. L. Mollison and A. E. Mourant.

After a brief introduction (Chapters 1 and 2), a chapter is devoted to the discussion of the A-B-O groups. Hardly any space is devoted to the fundamentals of blood grouping and no description of technic is given, the bulk of the chapter being devoted to the subgroups of A and recent work on the A-B-O groups. The selection of topics is not a happy

one since most of the space is devoted to such controversial matters as Hirzfeld's transitional forms, Morgan's so-called H substance, the theory of incomplete mutation and Wurmser's physico-chemical studies and her claim that she can distinguish homozygous and heterozygous blood by tests on the serum isoagglutinins. The presentation of the genetics of the subgroups of A is very clear, the distinction between genotypes and phenotypes being carefully pointed out. Interesting data are presented on the distribution of the A-B-O blood groups among 190,000 subjects of the United Kingdom, and the subgroups of A among 5,000 individuals. The section on the calculation of gene frequencies will be of most interest to readers with some mathematical background. In the discussion of the nature of the anti-O agglutinins, no mention is made of Wiener's theory postulating that this serum reacts with the products of genes *O* and *A*₂. Moreover, when discussing univalent alpha and beta antibodies, no mention is made of the work by Wiener and Sonn showing that these antibodies pass through the placenta readily while the placenta probably holds back bivalent alpha and beta antibodies, paralleling the behavior of Rh antibodies.

After a terse section (Chapter 5) on the blood group antigens in the human body the authors present a most valuable chapter on the M-N-S types. Interest in this subject has been enhanced by the discovery by Walsh and Montgomery of a new agglutinin S which Sanger and Race showed to be related to the agglutinogens M and N. When discussing the heredity of the three M-N types the authors appear to be overly impressed by the excess of type MN children in MN × MN matings, which occurred in some of the published studies on the subject, including their own. They even state that this may be an example demonstrating "in a direct way the phenomenon of the heterozygote being favored by selection." However, evidence is available that the excess of type MN children observed in these studies was due in part to technical errors, and in part to accidental statistical deviations. This chapter contains an instructive section on the preparation of anti-M and anti-N sera, but, no doubt, the most interesting and valuable part of the chapter is the discussion of the M-N-S types. The paragraph discussing the occurrence of anti-M and anti-N in human sera was apparently written before the report of Wiener that such antisera can be produced by injecting type M blood into volunteers of type N.

Chapter 6 is devoted to the P agglutinin of Landsteiner and Levine. A useful summary of the published data on the distribution of the P agglutinin is tabulated, as well as data on the heredity of the P agglutinin. Informative sections on the technic of P grouping, P variants and P antisera are also included.

Chapters 7 to 10 dealing in succession with Rh antigens, the inheritance of the Rh blood groups, Rh antisera and method of Rh testing, make up the most interesting and valuable portion of the book. Unfortunately, this section is marred by the authors' continued adherence to the Fisher-Race cross-over hypothesis. This is difficult to understand because in the October, 1950 issue of the *Annals of Eugenics*, Lawler, Bertinshaw, Sawyer and Race write "No example of crossing-over has been found in the families tested by this Unit, nor do we know of any certain examples found elsewhere . . . The work done by Dr. Alexander Wiener's laboratory and in this Unit has established with certainty the manner of inheritance of the allel-morphs of Rh. . . ." Thus, Race and his collaborators concede that there is ample family and statistical evidence to support the theory of multiple alleles while there is no tangible evidence in support of the theory of triply linked genes. Incidentally, it should be pointed out that as early as 1942 when only factors Rh₀ and rh' were known, by a simple statistical test Wiener excluded the existence of separate pairs of genes for these two factors, and therefore discarded the concept of linked genes, which was later taken up again by Fisher and Race. Throughout the book the authors use the following "short" symbols: *rr* for *cde/cde*; *R₁r* for *CDe/cde*; *R₁R₂* for *CDe/cDE*; etc. The "short" symbols are manifestly merely variations of the original Rh-Hr nomenclature. Race and Sanger therefore use two nomenclatures, apparently resorting to Wiener's when it is impossible otherwise to express themselves clearly.

In the chapter on Rh antibodies valuable data on the distribution of the Rh₀ factor throughout the world are presented, as well as data on the distribution of the eight Rh types. Then follows an interesting discussion of the evolution of the knowledge concerning the Rh-Hr factors with special reference to the British work and Fisher's interpretation

of the findings. The authors fail to point out that Fisher's prediction of the existence of three Hr factors has not yet been convincingly confirmed, since only hr' and hr" have been clearly demonstrated. The only well-documented report on *d* is that of Hill, Haberman, et al., and this has been challenged by the reviewer because he was unable to confirm their findings with samples of the patient's serum which were sent to him. Considering that so many other new blood properties recently announced have been immediately confirmed and reagents for them found, it is strange, if *d* really does exist, that workers like Sanger and Race, among many others, have been unable to find an anti-*d* reagent in tests on thousands of sera containing abnormal isoantibodies.

The authors' adherence to the Fisher-Race theory of genetics of the Rh-Hr types has resulted in an apparent tendency to force the facts to fit their theory. For example, the designations anti-*C* + *C*^w and anti-*D* + *D*^u used in the book may be said to be incorrect, because these two antisera each contain a single antibody. On the other hand, the designation *C*^w*De* is inconsistent with Race's statement that his nomenclature always indicates the factors present in a blood, because such blood contains the two factors *C* and *C*^w. Similarly, the symbol *c*^v*De* fails to indicate the reactions of this agglutinin with both antisera anti-*C* and anti-*c*, and in addition the Fisher-Race theory precludes the existence of agglutinogens or chromosomes containing *C* and *c* at the same time. In the section on the so-called *D*^u antigen, Race and Sanger fail to point out that *D*^u is merely Stratton's misnomer for the Rh₀ variants first described by Wiener in 1944. As was originally pointed out by Wiener, the Rh₀ variants are factors similar to but not identical with Rh₀, and therefore react with reduced avidity with anti-Rh₀ sera. Thus, all *potent* anti-Rh₀ sera, with possibly rare exceptions, whether bivalent or univalent, will clump cells containing Rh₀ variants provided that the blood cells are first treated with proteolytic enzymes. For this reason table 36, showing the variable reactions of cells containing Rh₀ variants when tested with a large panel of anti-Rh₀ sera, may be misleading.

In Chapters 11 to 16, the authors take up in turn more recently discovered systems of blood group antigens, namely, Lutheran, Kell-Cellano, Lewis, Duffy, Levay, Jobbins and others. In this way the authors have brought together information hitherto not readily accessible. Then, in an interesting chapter, they explain how to identify abnormal antibodies present in a serum and describe complicated problems of multiple sensitization. In Chapter 18 they calculate the multiplicity of possible blood group combinations, using the 18 to 20 specific reagents available in their laboratory. Chapter 19 briefly summarizes the relationship of blood groups and disease, and the book closes with an instructive chapter on the application of blood grouping in medicolegal problems of disputed parentage and identity.

The authors are to be congratulated for this fine contribution, and with the few reservations mentioned above their book is recommended highly to those seeking information concerning the most recent developments in blood grouping. Since the book is an excellent one and there is no doubt that it will be a reference standard for some time to come, the reviewer trusts that his criticisms will not be misinterpreted. After all, it is the duty of the reviewer to mention not only the good points of a book but also the aspects concerning which a difference of opinion exists.—A. S. Wiener