SCIENTIFIC BOOKS

VIRUS AND RICKETTSIAL DISEASES

Virus and Rickettsial Diseases: With Especial Consideration of Their Public Health Significance. Harvard School of Public Health Symposium Volume. 907 pp. Cambridge, Mass.: Harvard University Press, 1940. $6.50.

IN June, 1939, a symposium on virus and rickettsial diseases was held at the Harvard School of Public Health. Rickettsial diseases were included in the symposium, according to Dr. Zinsser's statement in the foreword, "partly because there was until not so long ago a confusion between these conditions and those caused by virus agents. Indeed, in some quarters of the world such confusion still persists." The volume containing the record of the symposium consists of thirty-four papers, which deal with many subjects in the virus and rickettsial fields: epidemiology of virus diseases; nature of viruses; immunology of virus infections; insect vectors of virus diseases; variola; vaccine virus and vaccinia; measles; mumps; dengue fever; lymphogranuloma inguinale; absorption of materials from the respiratory tract; human and swine influenzas; canine distemper; psittacosis; poliomyelitis; a tentative classification of virus diseases of the central nervous system with a consideration of certain epidemic types of encephalitis; rabies; equine encephalomyelitis; lymphocytic choriomeningitis; louping ill; yellow fever; and finally a general survey, diagnosis, classification, clinical features, epidemiology and immunity of the rickettsial diseases. These subjects have been handled by the following workers: W. L. Aycock, K. D. Blackfan, H. D. Chope, C. K. Drinker, R. C. Eley, J. F. Enders, L. D. Fothergill, J. E. Gordon, R. A. Kelser, C. F. McKhann, J. R. Mote, J. H. Mueller, N. A. Nelson, H. Pinkerton, E. S. Robinson, R. A. Ross, F. F. Russell, A. W. Sellards, J. S. Simmons, C. Wesselhoeft, S. R. Wolbach, H. Zinsser.

An extensive field is covered by the symposium, and the development of knowledge about the diseases discussed has been very rapid during the last twenty years. Not only has the development of the knowledge been rapid, but for certain kinds of experimental work in the field special training is now required. Although knowledge of virus and rickettsial diseases has within the last two decades developed rapidly, orderly and comprehensive presentation of this knowledge to practising physicians and public health officers has lagged. There are several treatises on these diseases, for example, the one by Doerr and Hallauer and that by Levaditi and Lépine. These, however, were prepared more for highly trained workers in the field than for those not so intimately associated with the problems; and for that reason they do not fill the need admirably taken care of by the Harvard symposium. It is surprising that one medical school could marshal enough individuals to write attractively about so many different diseases. While many of them are authorities upon the subjects handled, others have had no first-hand knowledge of the material considered. However, in spite of this fact, papers by the latter group of authors are scholarly and provide adequate reviews of existing knowledge. If one desires an authoritative discussion of virus and rickettsial diseases without too much technical detail one would do well to read the book.

There are several chapters dealing with general subjects, *e.g.,* epidemiology, nature of the agents, immunity and insect vectors. In addition to the general chapters, there are many dealing with individual diseases. A survey of these diseases makes it obvious that those common to man or the diseases of lower animals that may affect man have been dealt with. For this reason the chapter on canine distemper appears to be out of place, and at least six diseases of human beings, some of which are important, have not been discussed, namely, molluscum contagiosum, herpes febrilis, varicella, herpes zoster, trachoma and inclusion blenorrhea. It is true that varicella and herpes zoster have not been definitely shown to belong to the virus group. However, the presumptive evidence is sufficient to include them in any discussion of virus diseases attacking human beings.

Inasmuch as the book was admittedly compiled for those who are not authorities in the virus and rickettsial fields, the authors should have been exceedingly careful to avoid mistakes which would be obvious to experts but misleading and confusing to the uninitiated. For the most part the material presented is correct and straightforward. However, certain inaccuracies have been observed, and a few of them will be mentioned. In the chapter on the properties of viruses considerable space is given to retrograde evolution in relation to the nature of viruses without noting the fact that Dr. Green, Dr. Gortner, Sir Patrick Laidlaw and others have already recorded similar views. The author dignifies his hypothesis with more experimental evidence than do the writers just mentioned, and for that reason the chapter is very interesting.

In the chapter on immunology of virus infections the dilution phenomenon (p. 94) is discussed. When a virus and its immune serum are mixed in a manner to obtain an inactive preparation, dilution of the preparation often results in its becoming active again, thus demonstrating the absence of a stable union between the virus and its neutralizing antibodies immediately after the mixture has been made. Schultz, Andrewes and Todd's experiments on this phenomenon are cited, but no mention is made of Bedson, who presumably was the first to show it in relation to virus diseases. Of

more importance, however, is the fact that no mention is made of later experiments by Andrewes and others which demonstrated an irreversible union *in vitro* between vaccine virus and its neutralizing antibodies; at least a vaccine virus-antiserum mixture kept *in vitro* for a period of time no longer yields active virus on dilution.

On page 98 the statement is made that "alexin fixation was the first *in vitro* virus reaction to be studied" and that Gordon in 1925 was one of the first to report alexin fixation and precipitation with vaccine virus. This statement is somewhat misleading, because Freyer in 1904 is considered to have definitely demonstrated that flocculation occurs in a mixture of vaccinia-immune serum and vaccine virus. Moreover, in 1906, Jobling demonstrated that complement is fixed in the presence of a mixture of vaccine virus and antivaccinal serum. Finally, Paschen, in 1913, reported that elementary bodies of vaccinia are specifically agglutinated by vaccinia-immune serum.

In the chapter on insect vectors of virus diseases, insect-borne virus diseases are tabulated (p. 137). In the first section of the table are placed diseases of insects that are insect-borne. It is true the diseases which are mentioned are maladies of insects, but they are not in the technical sense insect-borne. Indeed, the author on page 136 states that "the diseases may be transmitted either by inoculation or through the ingestion of contaminated food," thus indicating that he himself recognizes that they are not insect-borne infections.

In the chapter on epidemiology and the control of variola one finds the statement (p. 177): "We are still lamentably ignorant of the etiology of smallpox and of the behavior of the virus." It should be pointed out that those who are working with vaccinia and smallpox believe that they can recognize and identify with great accuracy the cause of these maladies.

The discussion of autopsy findings in generalized vaccinia in human beings (p. 220) is inadequate. The author should have consulted the excellent article on the "Histological and Experimental Observations upon Generalized Vaccinia in Man," by Dible and Gleave (*Jour. Path. and Bact.*, 38: 29, 1934).

The authors of chapters on measles do not handle equally well the discussion of experimental transmission of the disease to animals. Enders does it in a critical manner; he treats the work of Taniguchi in a satisfactory way, finally stating that this investigator probably in an accidental manner picked up vaccine virus in the process of his experiments on measles. McKhann, on the other hand, leaves the uninitiated with the idea (pp. 274–5) that perhaps Taniguchi successfully transmitted measles to rabbits and then back to man.

The chapter on distemper appears to have been prepared in a perfunctory manner. Indeed, there is no apparent reason for its inclusion in the book. Moreover, on page 519 the statement appears that Dunkin and Laidlaw proved in 1928 the primary cause of canine distemper to be a filtrable virus; the reference given is from *The Field, The Country Gentleman's Newspaper* of that year. As a matter of fact, Dunkin and Laidlaw first reported their splendid findings in three papers during 1926 in the *Journal of Comparative Pathology and Therapeutics.*

In the chapter on psittacosis it is stated (p. 529) that Krumwiede and his associates were among the first to show that psittacosis is caused by a filtrable virus. The statement is true, but to Bedson and his associates goes the credit of being the first to do it. Incidentally, the reference to Bedson's original work is not found in the bibliography. That white mice can be used for the experimental study of the disease is the important observation made by Krumwiede and his associates.

Confusion may result from the inclusion of Borna disease (pp. 662–3) in the group of encephalitides discussed in the chapter on equine encephalomyelitis. Borna disease is an encephalitis of horses, but it should not be included any more than rabies in this particular group. In the first place, the virus of Borna disease is 85–125 mμ in diameter, while that of the eastern and western equine encephalomyelitis is in the neighborhood of 20–30 mμ. In addition, other characteristics set Borna disease apart from the group of maladies under discussion.

Howitt is given credit (p. 691) for showing that a specific soluble antigen is responsible for complement fixation in the presence of lymphocytic choriomeningitis immune serum. She showed that complement fixation occurs, but it remained for Smadel and his associates to demonstrate that a soluble specific substance separable from the virus itself is responsible for the reaction.

The author of the chapter on etiology of yellow fever is too critical of laboratories in which accidental infections have occurred (p. 719). Perhaps he has forgotten that one of his laboratory associates contracted the disease and does not realize that the nature of the work carried on in different laboratories, instead of carelessness, may account somewhat for the differences in morbidity.

In the chapter on epidemiology of yellow fever (p. 737) the following statement appears: as a proved virus infection yellow fever has been known only since 1927. Exception should be taken to this, because Reed, Carroll, Lazear and Agramonte in 1900–1 proved by human experimentation that yellow fever is a virus disease. The work of Stokes, Bauer and Hudson in

1927, in which monkeys were used, thoroughly confirmed these findings and established for all time the virus nature of the malady.

The book is bound well. The paper is excellent. The type is large and easy to read. As a rule extensive bibliographies appear at the end of each chapter; the references have been well chosen, and those that have been checked are correct. The book is remarkably free from typographical errors. However, on page 691 Dr. Muench's name is misspelled, and on page 891, line 28, the word "protection" obviously should be "production."

One great fault to be found with the book is that it contains no index. This defect will decrease its usefulness for people who are not familiar with the subjects presented.

In spite of the errors and faults listed above, many of which are minor and relatively unimportant, the book as a whole provides a greatly needed discussion of diseases in a relatively new and very active field about which sufficient treatises for the practising physician and public health officer have not appeared. The part of the book dealing with rickettsial diseases is particularly good and one obtains the impression while reading it that experts in the field have taken a great deal of delight in presenting in a fascinating manner the results of their labors as well as those of their colleagues.

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CALIFORNIA SHRUBS

An Illustrated Manual of California Shrubs. By HOWARD E. MCMINN. xi + 689 pp. 775 figs. San Francisco: J. W. Stacey, Inc. 1939. $5.00.

"THE object of this volume," to quote the opening paragraph of the author's preface, "is to present a systematic and descriptive account of the shrubs of California which will serve as a working manual for their identification by the forester, ranger, traveler, vacationist, teacher, landscape designer, gardener and student of nature. While primarily planned for the use of the general public, the book has been written to serve also the professional botanist who is interested in the native shrubs of California."

This is a broad objective and difficult to accomplish, but in my opinion the author has succeeded admirably. The descriptions are clear and concise, and the keys are well arranged. Those not versed in technical botanical terms will find a glossary in the back and an abbreviated "Gray's Lessons" in the introduction. Ecologists and plant geographers will be interested in the discussion of the ecological classification of plants and the various shrub formations in California. A feature of the book that will be useful to those interested in cultivating native California plants is a chapter on the "use of California shrubs in garden design" contributed by Fred H. Schumacher. Some of the headings of this interesting chapter will suggest its character and scope: "Background Shrubs," "Accent Shrubs," "Ground Covers," "Shrubs for Hedges," "Shrubs for Rockeries and Wall Crevices," "Shrubs for Seaside Gardens," "Ornamental Fruits," "Woody Plants for the Perennial Border." Some 800 species and 200 varieties are recognized, and 775 of these are illustrated by text figures from line drawings or in the case of 20 species by full-page half-tones.

One familiar with the California flora will be surprised that a thousand species and varieties of "shrubs" are recognized, but the book is not limited to true shrubs. It also includes "woody vines, subshrubs, woody cushion plants and half shrubs." No doubt the clientele for whom the volume has been prepared will welcome the inclusion of these semi-woody plants, such for instance as 32 species of Penstemons, only 8 of which are really shrubs. The title is therefore a misnomer in that it understates the full scope of the work. But this is a refreshing fault, for many of our popular and semi-popular books on native plants err on the other side. Too often wild flower books and tree or shrub books are so titled that they give the impression that they cover all "America," whereas they include only those species found in the original thirteen colonies or some other restricted area.

One finds in scanning the pages that the floristic composition of the California lignescent flora (excluding trees) represents some sixty-five plant families. The families with twenty species or more are: Salicaceae (27), Polygonaceae (36), Saxifragaceae (34), Rosaceae (52), Fabaceae (46), Rhamnaceae (50), Ericaceae (58), Menthaceae (20), Scrophulariaceae (47), and Asteraceae (117). The genera having ten or more species are: Salix (27), Quercus (14), Eriogonum (36), Atriplex (18), Berberis (Mahonia) (10), Ribes (28), Lupinus (13), Ceanothus (40), Malvastrum (12), Arctostaphylos (38), Salvia (14), Penstemon (32), Lonicera (10), Haplopappus (21), Brickelia (13).

On the whole the author has maintained a conservative concept not only of species but of genera and families. His family "Fabaceae" includes Caesalpinaceae and Mimosaceae and is equivalent to the old "Leguminosae." Rosaceae and Saxifragaceae are also used in the broad sense. His conservatism in generic concept is illustrated by the combining of the American genus Hosackia with the Old World Lotus, Mahonia with Berberis and Ericameria with Haplopappus. One is surprised therefore to find Xylococcus separated from Arctostaphylos. I personally approve the segregation, but then I would also segregate Mahonia and Berberis, and Hosackia and Lotus.