the method of comparing sedimentation rates of equal volumes of corpuscles in plasma and synovial fluid, and the results in a series of 130 are highly interesting, but, being complicated by varying viscosity, are somewhat hard to interpret.

Part IV. reviews fully the therapeutic and diagnostic indications and technique of aspirations and less widely practised procedures such as direct visualisation, lavage, gas insufflation and the use of radio-opaque media. Certainly double contrast roentgenograms give in some cases a very clear idea of what America calls "joint pathology" (what we would call morbid anatomy), and could be more widely used, in spite of the slight inflammation which often ensues.

This book is of value in stimulating interest in these problems. Some of its author's opinions will certainly provoke violent disagreement, and many of them will probably have to be modified as knowledge in this field advances, which it is doing rapidly. On the east coast of the States, particularly, there is an enormous amount of research proceeding, which, when it emerges, will be worth all the isolated and familiar figures from Von Holst's downwards. Its value will lie not so much in its accuracy, not so much that it will deal with large numbers of observations, but that the observations, let us say on pathological synovial fluid proteins, will be correlated with adequate clinical records, roentgenograms, blood proteins, sugar, chlorides, viscosity, cytology, etc. A long-term research policy such as this will render clearer some of the problems dealt with in this book; it is to such long-term research that the Empire Rheumatism Council is devoting much of its resources.

E. G. L. BYWATERS.

Focal Infection and Arthritis in the Light of Experiment. By EJNAR JARLOV and OVE BRINCH. Lassen and Stiedl, Copenhagen, 1938.

The ætiology of arthritis is still an unsolved problem. The part played by infection is, however, well recognised, and the trend of modern thought is to regard arthritis, more especially the rheumatoid (infective) type, as a streptococcal infection arising from some focus in the body, which may be associated with the teeth, tonsils, nasal sinuses, gall bladder, intestinal or genito-urinary tracts. Ejnar Jarlov and Ove Brinch, in an important monograph, have recently reviewed the subject of focal infection and arthritis. This study is based on experimental evidence on rabbits, thoroughly investigated and followed up for varying periods. They discuss fully the pathological histology of the dental and parodontal tissues. There is an excellent chapter devoted to the pathological anatomy of the arthritic lesion and the examination of one thousand histological specimens of joints and organs. Observation on the locomotion of rabbits following bacterial injection

has been carefully carried out by means of slow-motion pictures, which have revealed more about the progressive stages of the crippling than the casual examination of the animals could possibly have done.

Investigations were made both with the "short chained," presumably the viridans streptococcus, and the more virulent hæmolytic type, these organisms having been previously recovered from focal infections in the human subject. The general conclusions were similar to those drawn by Rosenow, Siegmund, and others—namely, that different strains of streptococci display differing tendencies in the production of inflammatory lesions. There was insufficient evidence from the experimental data to show whether the lesions were due to a peculiarity of the bacteria or to a special tissue affinity, or both. The tendency was for the low-grade infecting streptococci to give a higher percentage of infected joints. The symptom complex of rheumatic fever as in man was not produced even by the more virulent types of streptococci. The conclusion drawn by the authors is that rheumatic fever is ætiologically different from the chronic rheumatic diseases.

Experimental evidence suggested a close relation between osteo-arthritis and rheumatoid arthritis. Although this may be criticised on clinical grounds, the reviewer of this monograph has found that in a small percentage of cases of osteo-arthritis the suspension stability rate is rapid and the antistreptolysin titre of the blood is high, suggesting that an infective process is at work. A careful follow-up of these cases, however, later revealed that they were of the nature of true rheumatoid arthritis and not osteo-arthritis. There is no doubt that the observations made lead to the conclusion that the infection is of hæmatogenous origin, since there were pathological changes of toxic character involving the parenchymatous tissues of the liver and other internal organs. It is an unsolved problem as to whether it is the direct action of the streptococci themselves or their antigens or waste products (exo- or endotoxins) that cause the changes in the joints. The probability is that the endotoxins of the organisms are responsible, and that they cause an endarteritis obliterans in the capillaries of the joints, leading to the pathological changes which are described. This theory is supported by the work of Hadjopoulos and Burbank in America, and the present reviewer in this country. In conclusion, it is important to emphasise that the authors lay stress on a detailed investigation and thorough treatment of infective foci in the early stages of rheumatic disease when there are few signs of joint changes in the patient, a detail often overlooked. The careful researches of Jarlov and Brinch deserve the attention of all who are interested in rheumatology.

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