pounds/square inch, but a low tensile strength—800 pounds/square inch. When Ostamer is used in the treatment of long bone fractures of the lower limb, an intramedullary rod reinforcement should be incorporated. Bone chips and anorganic bone may be added to the resin, but these materials reduce its mechanical properties. From a study of the tissue reaction in various animals it would appear that, with the material tested, no undesirable tissue reaction resulted.

The author gives some details of fifty cases which he has treated. In some of these cases there had been previous bone infection, yet union of the fractures was achieved. Of the fifty cases, twenty-eight healed uneventfully, five continued to drain and three tibial cases were failures. It is difficult to ascertain from the text the fate of the other fourteen.

No one would deny that there is a place for a gap-filling cement in orthopaedic surgery which is apparently resorbed and replaced by bone, but its use must be limited until more is known about the long-term tissue reaction and route of excretion of polyurethane resins in man. As the author says: "The first indication for Ostamer fixation at surgery, therefore, would seem to be the non-union of bone in which previous surgery had failed."

This book lacks the details which are necessary for the accurate assessment of a technique.—
John T. SCALES.

Wirbelgelenk und Bandscheibe. Ihre Beziehung zum vertebralem Schmerz. Zugleich eine Stellungnahme zur Chiropraktik und Begutachtung. By Prof. Dr L. ZUKSCHWERDT, Dr med. habil. E. EMMINGER, Dr F. BIEDERMANN, and Dr H. ZETTL. Zweite, neu bearbeitete und erweiterte Auflage. 10½ × 7½ in. Pp. 319, with 160 figures. Index. 1960. Stuttgart: Hippokrates-Verlag. Price DM 58.

This is an important book. It makes a sincere effort to bridge the gap between the practising orthopaedic surgeon, the pathologist and the chiropractor or manipulative surgeon.

It starts from two bases: the recognised beneficial effect of manipulation, and the ignorance of the special pathology that might be benefited by manipulation. The authors contend that the work of Schmorl and Junghans has largely been directed to studying the pathology of the intervertebral disc and has left the pathology of the lesser intervertebral joint almost untouched.

The first section of the book is devoted to the re-examination of disc pathology and a study of the pathological changes in the lesser intervertebral joints, together with the possible causes of narrowing of the intervertebral foramina. These include not only disc prolapse, but disc degeneration with bony peripheral hypertrophy, hypertrophy of the ligamentum flavum, formation of the fatty bodies around the lesser intervertebral joints, arthritic changes in the lesser intervertebral joints and anoxaemia of the issuing nerve root as a result of the vascular pathology. The almost universal presence of a small intra-articular disc in the lesser intervertebral joint is clearly demonstrated, and it is suggested that acute lumbago is due to nipping of this like a medial semilunar cartilage [medial meniscus]. The variety of possible pathology in narrowing intervertebral foramina is equalled by the variety of treatments to which a cure has been attributed but which do not always act with certainty. A careful examination of the pathology of spondylosis deformans and its relation to back pain is followed by a routine section on the signs and symptoms of nerve root irritation on an anatomical basis. This is perhaps the only part of the book with which there will be general agreement.

The most valuable section now follows: a description of the varieties of pain related, or possibly related, to spinal disease. Here the authors go further than usual by attributing a wider range of peripheral disorders to nerve root irritation than is generally accepted, though this hypothesis forms the basis of chiropraxis. Thus, cervical migraine, peritendinitis of the shoulder, tennis elbow, nocturnal paresthesia and dysphagia are all considered as well as the more familiar syndromes with an agreed vertebral origin.

The borders of the known and the unknown are carefully examined and the deficiencies in knowledge admitted, but this book succeeds in offering a more rational basis for manipulative treatment than previous volumes. While the value of surgical treatment is not denied, the difficulties in selecting suitable cases are clearly stated, and the well-known fact that the expected pathology is not always found at operation and yet the symptoms clear up is well considered. More attention, however, is devoted to routine conservative treatment in relation to the suggested pathology that varying degrees of nerve root compression are the basic cause of most of the syndromes described: pain, muscle spasm, sensory and muscular dysfunction and paresis, and sympathetic nerve disturbance. The manipulative methods employed are clearly described and illustrated.

This is an excellent review of the borders of the known and unknown in spinal pathology and, if a little biased towards manipulative treatment, is perhaps all the more stimulating.—J. G. BONNIN.